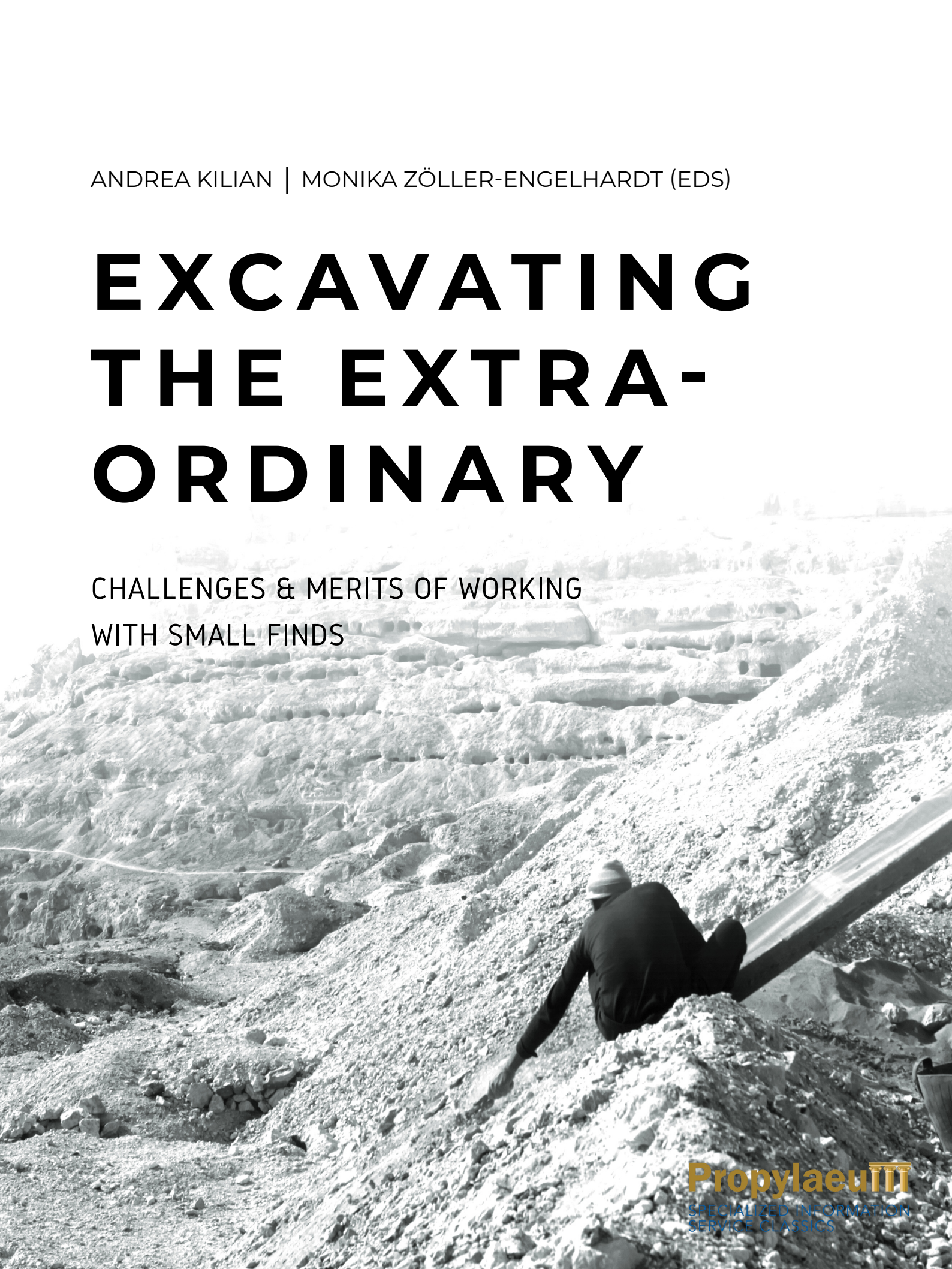
ANDREA KILIAN | MONIKA ZÖLLER-ENGELHARDT (EDS)

EXCAVATING THE EXTRA-ORDINARY

CHALLENGES & MERITS OF WORKING WITH SMALL FINDS



Propylaeum
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ANDREA KILIAN | MONIKA ZÖLLER-ENGELHARDT (EDS)

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PROCEEDINGS OF
THE INTERNATIONAL EGYPTOLOGICAL WORKSHOP
AT JOHANNES GUTENBERG-UNIVERSITY MAINZ,
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Content

INTRODUCTION: Finding the 'Extra' in the 'Ordinary'*

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1 Background and goals of "Excavating the Extra-Ordinary"

In times of post-processual archaeology and contextualizing from an emic point of view, the merits of working with even the tiniest archaeological evidence have come into the foreground in most Egyptological fieldwork undertakings.[1] Long gone are the times of disregarding fragmentary and unspectacular objects,[2] of burning undecorated coffin fragments[3] or disregarding non-pharaonic structures in favor of 'more interesting' artifacts and monuments[4]. By now, everyone working in an archaeological profession knows that astonishing conclusions can be drawn from analyzing seemingly 'ordinary' finds.

And yet, the challenges of working with ancient material still remain unchanged: Researchers

* We thank Eva Gervers and Nadine Gräßler for their constructive comments on our introduction and Jeff Simpson for correcting our English; all remaining mistakes are our own.

1 For an overview on recent trends in archaeological theory see, e.g., Johnson ²2010; Hodder ²2014.

2 The interest in publishing large amounts of seemingly 'ordinary' objects has sometimes been less than ideal, Rahmstorf (2015: 3), e.g., cites Woolley's stance on finds as "mundane" as spindle-whorls: "*If I devote a special section of my text to spindle-whorls I do so with apologies; my object is simply to clear the ground as expeditiously as possible of a mass of material of no great interest which would otherwise obtrude unduly. The scientific importance of spindle-whorls has been very much exaggerated.* […] *I suppose that it was Schliemann who first brought the spindle-whorl into prominence – a venial error in his case, but today there is no excuse for wasting space and money on this monotonous and profitless material.*" (Woolley 1955: 271).

3 See, e.g., Hogarth (1910: 157) describing his practice of living in the nomarchs' tombs at Asyut during the winter months: "*Warmth after the day's toil we never felt from December to February, even when sitting closest to the fire which we kindled nightly with unpainted slats of ancient coffins on a hearth of Old Empire bricks.*" Actual traces of the living arrangements of the early excavators were discovered time and again by the Asyut Project team during the work on the Gebel Asyut al-gharbi (cf. Kahl 2007: 30–33; Kahl et al. 2016: xx–xxii, 339–343).

4 Cf., e.g., Petrie, who worked ten weeks at the temple area in Athribis and destroyed layers of re-use (Müller 2015: 179). Petrie sometimes explicitly mentions monuments which he deemed not worth excavating, e.g. a decorated Roman chapel near the temple area of Athribis: "*Below that is a chapel of Roman age* […], *at the side of the approach to the gate of Physkon. It is covered with long scenes of gods, and the work is so rough that it was not worth copying. The interior was not cleared out.*" (Petrie 1908: 11).

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have to deal with huge amounts of pottery, sort heaps of fragmentary worked wood, work with an abundance of poorly preserved ropes, baskets and bandages or analyze infinitesimal traces of metal – often found in a disturbed or mixed context. This situation is a difficult setting to work with, since time and again researchers face situations in which the results remain inconclusive or the amount of seemingly 'ordinary' material is too much to include in conventional (print) publications.[5]

Against this background, the topic of "Excavating the Extra-Ordinary. Challenges and merits of working with small finds" is based on our own experience. We both have struggled with vast numbers of unidentifiable small fragments of pottery or wood from disturbed contexts, have heard fragmentary finds been termed 'uninteresting' and have seen large quantities of small finds[6] without provenance sitting unappreciated on magazine shelves or stacked in boxes. We both had to invest years of learning and training, of trial and error, to become somewhat acquainted with the broad spectrum of material and some of the best practices in our respective fields. In doing so, we observed that there is a need for deeper exchange and sustainable knowledge transfer on the complex and wide subject of working with small finds.

Thus, the goal of the workshop "Excavating the Extra-Ordinary" was to provide a platform for extensive exchange on all aspects of working with small finds and to bring together specialists from all areas of expertise and all stages of the processing of archaeological finds. This included field directors and participants of excavations, specialists in material analyses, staff from museums and universities, as well as independent researchers. It is clear that most scientific personnel fulfill more than one of these positions and functions and are involved in most of the fields of tension concerned with the work on small finds: from the stages of excavation to the post-processing analysis, storage and publication, as well as their afterlife, or better 'new life', in museums and collections. Therefore, we suggested a broad bandwidth of topics for discussion, including:

- How do you deal with largely disturbed contexts?
- How do you manage a huge number of finds?
- How do you identify specific items among mixed groups?
- Which deeper insights do you gain by analyzing difficult objects and contexts?
- Which methods proved useful to you and which not?
- How do you cope with inconclusive results?

The large number of responses to our call for papers demonstrated the relevance and topicality of the subject. Ultimately, the workshop "Excavating the Extra-Ordinary" formed into a two-day event with over fifty international participants and sixteen speakers. The lively discussions mirrored many of our questions and challenges and provided new insights on methodological issues and various fields of research.

2 General questions, definitions and points of discussion

In order to introduce different methods, several *modi operandi* and tested best practices of dealing with small finds, it is necessary at first to

5 Of course, we recognize the value of concise scientific presentation and interpretation of facts; nevertheless, we would like to emphasize the importance of making large quantities of 'ordinary' material available for comparison, verifiability and not least the preservation of knowledge.

6 On the concept of 'small find' see below.

narrow down the understanding of 'small find'. This provides the first challenge: definitions on the concept of small finds are varied and often somewhat vague, especially in regard to the ancient Egyptian setting.

Sometimes, small finds are equated with small 'artifacts', which, for example, C. Renfrew and P. Bahn define as: "*Artifacts are humanly made or modified portable objects, such as stone tools, pottery, and metal weapons*".[7] The definition, however, does not necessarily account for heavy (but still portable) objects, as well as fragmentary items or elements that were originally part of a larger structure, which are usually treated as small finds. Likewise unclear is, for example, the status of small botanical or organic remnants.

In contrast, another definition of 'small finds' results in a description of what it is not, as Feugère has put it: "*Tous les essais de définition proposés ici et là finissent par se replier sur une définition négative: les objets, c'est tout ce qui reste généralement sur la table où on étale le mobilier d'une fouille, quand on a ôté la céramique et les monnaies, qui ont déjà leurs 'spécialistes'.*"[8]

While this holds true in terms of the practical handling of excavated items or museum objects, we think that it is disadvantageous to separate finds by their object classes, material or availability of specialists when trying to compare methods and practices in dealing with large groups of archaeological material, fragmentary finds or disturbed contexts in general. Thus, while we still subdivided (partly material-based) thematic sections for the presentations of our workshop, we wish to emphasize the point that methodological questions are best approached by considering the overall picture, especially including the study of pottery, since ceramologists are very experienced in dealing with large amounts of material and fragmentary items alike. The broad thematic range of the contributions and the informed discussions during the workshop confirmed our assumption that the boundary of the concept 'small find' should be expanded to *small* finds[9], thus including large find groups such as pottery, botanical remains, fragments of larger objects and methodological areas dealing with these fragments.[10]

The challenge of working with small finds is not a new one and certainly not unique to Egyptology, as is the need for a delimitation of the term. Willey, for example, states regarding the work with small finds from contexts in Guatemala: „*We must begin by saying that there are no formal and systematic procedures for Maya lowland classification as there are for Maya lowland pottery. Instead, these 'other artifacts' have been treated in an ad hoc descriptive fashion, in somewhat different ways, by the archaeologists who have addressed the problem.*"[11]

In Egyptology, the separation of object groups by material or (supposed) function has a long

7 Renfrew/Bahn [3]2015: 338. They add that "*some researchers broaden the meaning of the term 'artifact' to include all humanly modified components of a site or landscape, such as hearths, postholes, and storage pits – but these non-portable artifacts are more usefully described as* ***features***" (ibid., emphasis in the original).

8 Feugère 2018: 7.

9 That means, instead of '*Kleinfunde*' as a category, '*kleinformatige Funde*' as an overall term.

10 It is noteworthy that not every 'fragment' is formed unintentional. On fragmentation theories and the theoretical implications of including fragmentary items in archaeological analysis and discussion cf. Martin/Langin-Hooper 2018.

11 Willey 1978: 1, cited after Voss 2004: vi. Compare also the title of Voß' publication explicitly naming "non-pottery small finds" ("*Die nichtkeramischen Kleinfunde aus Xpiché, Yucatán, Mexiko*").

tradition[12] and naturally specialists for these subject areas evolved. However, not only the division of find groups by material or function can cause an unidirectional point of view, but also the biased selection of material deemed worthy for publication by the early excavators. Already C. Kramer, in her seminal paper on interpreting ethnical implications based on variety in pottery findings of the so-called Ḫabur ware, explicitly mentions the danger of biased early publications: "*Ḫabur ware, having been considered diagnostic by its various excavators, has usually been described more fully than those ceramics stratigraphically associated with it.* […] *The absence of published references to specific plain wares resembling those found with Ḫabur ware at Chagar Bazar does not, for example, necessarily mean that such parallels do not exist at other sites, but may mean that for some reason the excavators of other sites considered them less worthy of published mention.*"[13]

The above-mentioned factors influenced our work, too. Our own archaeological specialties cover primarily the analysis of pottery and wooden objects. The challenges in working with these materials can be highlighted through the example of our work with finds from Asyut[14], Asyut being a prototypical example of a disturbed context with over 4000 years of continuous use and re-use and an exceptionally rich history of early excavations. A number of excavations took place during the end of the 19th and the beginning of the 20th centuries.[15] The most important longer-term missions were led by the French É. Chassinat and Ch. Palanque, the Italian E. Schiaparelli and the British E.G. Hogarth. As was usual at the time, missions subsequently provided museums with a large part of their numerous ancient finds made during their work. In the case of Asyut, these were the Louvre in Paris, the Museo Egizio in Turin and the British Museum in London.

Only the French team published their results,[16] whereas the reports, diaries and letters from Hogarth to his employer, the British Museum, were only published decades later by D.P. Ryan.[17] Schiaparelli did not publish anything at all,[18] but this gap is now being filled by the publication of his digging diaries by A.M. Sbriglio and the combined efforts of J. Kahl, P. Del Vesco and M. Trapani to correlate the knowledge about the activities of the early excavator with the recent field work at the site.[19]

Against the background of this complex excavation and publication history, the work on the pottery of Asyut provided a particular challenge, which may illustrate exemplarily some of the difficulties in working with small finds. Merely

12 W.M.F. Petrie is one of the most prominent examples of early researchers dividing finds according to raw material (cf. Bader, this volume: 14), e.g. in his overarching works on tools and weapons or objects of daily use (Petrie 1917 and Petrie 1924).

13 Kramer 1977: 94.

14 Our scientific work in Asyut was conducted as team members of the joint Egyptian-German project "The ancient Egyptian necropolis of Asyut: documentation and interpretation" (https://www.aegyptologie.uni-mainz.de/the-asyut-project-feldarbeiten-in-mittelaegypten fieldwork-in-middle-egypt/ [last accessed 11.12.2020]) of the universities of Sohag, Mainz and Berlin under the project direction of Jochem Kahl and Ursula Verhoeven-van Elsbergen.

15 Cf. Kahl 2007; 2012; Kahl et al. 2019: 10–21.

16 Chassinat/Palanque 1911.

17 Ryan 1988.

18 However, one anthropological report was published by G. Marro (1913), a member of Schiaparelli's team, on the skeletal human remains of the Asyut necropolis.

19 Kahl et al. 2019.

two of the publications mentioned above contain pictures of the pottery found by the early excavators: the excavation report of Chassinat and Palanque about their work in 1903 and the summary of Hogarth's work by Ryan.[20] The volume by Chassinat and Palanque offers, in total, three plates depicting pottery. The first shows a selection of the pottery retrieved from the tomb of Nakhti and a neighboring tomb.[21] The second depicts one clay vessel, which is lost today, originally found inside the coffin of Nakhti.[22] This lost vessel was the only one of its type known from Asyut. It is neither documented on another plate nor to be found in any of the museums into which the finds from Asyut were dispersed.

The third plate[23] is entitled "*Mobilier funéraire de Ouapouaïtoumhâït, tel qu'il était disposé au moment de l'ouverture du tombeau*" and shows the objects that accompanied Wepwawetemhat into the afterlife: a wooden statue, wooden models, a pottery offering tray and vessels. One of the three vessels can only be half seen; its other half was cut off by the photographer. The main focus of the early excavators is absolutely clear, as they devoted the neighboring plate to it: the wooden statue of the tomb owner.

Even the assessment of this photo, which is one out of only two pictures showing the find position of the objects mentioned in the excavation reports,[24] proved to be a misinterpretation. A first hint to this was provided by the photo itself, as it shows footprints below the objects. In the end, it turned out that the objects were not photographed *in situ* in the tomb of Wepwawetemhat, but instead, they were assembled in front of the north wall of Tomb Siut III (M12.1) (Fig. 1). So even the only photograph offering something like an *in situ* context is nothing more than a reinterpretation of the excavators, who arranged the finds either according to their memory or just in a way to be able to depict everything in one single plate, with only minor respect to the pottery.

However, the report itself mentions 302 vessels of pottery retrieved from the tomb of Nakhti alone: "*De nombreuses poteries en terre rouge très fine (il y en avait exactement trois cent deux),* […] *encombraient les abords de la niche autour des statues.*"[25] The Louvre Museum, where a part of the objects from Chassinat's and Palanque's work were delivered to, houses 34 vessels from Asyut. Only five of them can be linked with certainty to the vessels depicted on the first plate (pl. 15.1 cited above) that claims to show pottery from tombs no. 6 and 7, with no. 7 being the one of Nakhti.[26] So, the origin of the majority of the Louvre vessels remains uncertain. Additionally, their connection to the tomb of Nakhti and its neighbor is a matter of debate.[27] As all 34 of them make up only 10 % of the number of ves-

20 Chassinat/Palanque 1911 and Ryan 1988. There are some other publications which are, for the most part, more inventory-like descriptions of objects, but as neither drawings nor photographs were included with these, they are left aside here because they offer virtually no information on pottery at all, apart from the fact that it was found. Of course, nowadays, there are extensive publications available (e.g. Magee 1988, Zitman 2010), but here the focus is on the early excavators and their publications.

21 Chassinat/Palanque 1911: pl. 15.3.

22 Chassinat/Palanque 1911: pl. 23.1, between the wooden *ḥs.t*-vases and the metal washing basin and flask.

23 Chassinat/Palanque 1911: pl. 34.1.

24 The other one being a drawing of the burial chamber of Nakhti and the position of its inventory, Chassinat/Palanque 1911: 47, fig. 3.

25 Chassinat/Palanque 1911: 34.

26 Kilian 2019: 135, Abb. III.9.

27 Kilian 2019: 135–141.

Fig. 1: Combination of the photograph of the north wall of Tomb Siut III (M12.1) (© The Asyut Project) with Chassinat/Palanque 1911: pl. 15.3 (after Kilian 2019: 139, Abb. III.10).

sels found in the tomb of Nakhti alone, a huge amount of pottery must be deemed lost today.[28] Things are a little different when it comes to the publication of Ryan's summary of Hogarth's work in Asyut. Hogarth provided sketches of the pottery he found for every tomb according to "shapes". These "shapes" lack a description in textual form. Instead, Hogarth only provides depictions showing rough outlines of an abstracted vessel form. The trial to do a seriation failed, as the types are not differentiated enough and, as became obvious, different types or subtypes were sometimes attributed to the same "shape" which distorts the picture. It is, for example, not possible to distinguish accurately which vessels belong to Hogarth's "shape 1" or his "shape 13" and what the actual difference between the two shapes really is.

However, Hogarth was the first to provide sketches of about 50 tomb ground plans. Although they cannot be located today, ensembles can still be compiled according to tombs.[29] So, some of the vessels stored in the British Museum in London can still be assigned to certain tombs. However, in comparison with the inventories of the tombs as listed in Ryan's publication, it became quite clear that Hogarth almost never took the complete inventory/content

28 Chassinat and Palanque (1911: 34) mention that "*Tous les objets qui garnissaient la chapelle ayant été mis en lieu sûr,* […]", which has not been discovered yet.

29 E.g. Ryan 1988, Zitman 2010.

of one tomb, but made a very selective decision of which vessels to take and which not. So again, a seriation with the physical specimens stored in the British Museum failed, because there is almost no overlap between the single vessels, indicating that Hogarth aimed at presenting a broad and diverse spectrum more than a complete ensemble. This becomes especially obvious in his description of pottery tomb equipment and the comparison of the physical evidence in the British Museum.[30] Another clue in this direction is given by Hogarth himself: he gives counts of the vessel "shapes" he found in one tomb, but often these numbers are substituted by descriptions as "several",[31] "many",[32] "some",[33] "few",[34] or he gives descriptions like "[s]aucers, approximately 100 complete and fragmentary, plain",[35] or he only mentions "fragments"[36] of "shapes" or guesses[37] about the number.

This immensely distorts the overall picture and makes some important observations impossible. It is, for example, not possible to analyze if the number of vessels given to the dead increases over time (it does, judging by the descriptions, but how exactly and which kind of vessels is unclear). The function of the vessels cannot be analyzed either, because we do not know which kinds of vessels were found in which parts of the tomb and so on.

Although the situation regarding the attention of early excavators on the wooden (model) material from Asyut is somewhat better in comparison to the pottery, similar difficulties arise when consulting the few publications. Complete and aesthetically pleasing objects and object groups were described and sometimes photographed or drawn,[38] yet undecorated, fragmentary or simply 'uninteresting' objects of daily life were often summarily treated[39] or excluded from the descriptions altogether. Furthermore, fragmentary elements were often disposed of by early excavators, thrown away haphazardly or – as in the case of Asyut – shoveled from one tomb shaft into the other: "*A native guard informed Hogarth that this south side had not been excavated by Faraq so workmen were set to the task of clearing this area, Faraq's piled debris being thrown into one of the previously cleared shafts.*"[40]

This provides, for example, a specific challenge for the analysis of the fragmentary wooden material found during the re-excavation of the large nomarch's Tomb Siut III (M12.1). Although there is ample evidence that the tomb was used by the early French, Italian and English excavation missions as a base station and camp,[41]

30 See the compilation of the vessels and tombs with the description given by Ryan based on Hogarth's documents in Kilian 2019: 379–414, Dok. 1–Dok. 42.

31 Ryan 1988: 26 referring to "Shape 1" vessels, ib. 44, 57, 60.

32 Ryan 1988: 31 ("*many complete and fragmentary specimens*"), 36, 55, 32 ("*many plain complete and broken examples*"), 64.

33 Ryan 1988: 35, 61.

34 Ryan 1988: 65.

35 Ryan 1988: 19.

36 Ryan 1988: 28.

37 Ryan 1988: 79 referring to the number of vessels of "Shape 1": "[…] and about the same number broken".

38 Cf. e.g. the female offering bearers/estate figurines from the tomb of Nakhti in Chassinat/Palanque 1911: pls. 4. 9–10.

39 Compare, for example, Chassinat/Palanque's note on wooden handles of shields, after describing and displaying only one sample object: "*Cet objet, assez commun dans les musées, a été rencontré à plusieurs exemplaires au cours des fouilles.*" (Chassinat/Palanque 1911: 18).

40 Ryan 1988: 13.

41 Kahl 2007: 31–32; Kahl et al. 2016: 339–343; Zöller-Engelhardt 2016: 5; Kahl et al. 2019: 14, 78, 234, pl. 67a.

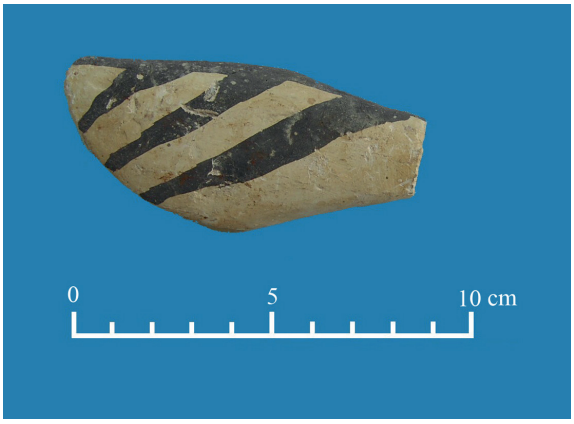

Fig. 2: Wings of model bird (photo: M. Zöller-Engelhardt, © The Asyut Project; cf. Zöller-Engelhardt 2016: 62, cat.no. M123.1; Zöller-Engelhardt 2012: pl. 6).

Fig. 3: Female offering bearer/estate figurine from the tomb of Nakhti at Asyut (Cairo, Egyptian Museum JE 36290; Chassinat/Palanque 1911: pl. 9).

we have no account of the actual field work conducted inside the tomb or the removal of objects. In addition, the quote above illustrates that fragmentary or 'ordinary' objects were removed from their findspot and disposed possibly within the context of another. The additional analytical dimensions of subsequent re-use in antiquity, tomb robbery and environmental influences create a multi-layered challenge for the researcher. Without sufficiently published comparison material or with only insufficient information on original contexts, it is difficult to identify small wooden fragments out of their original structure or context. Tomb Siut III (M12.1) offered various examples of such fragmentary wooden material – see, for example, the object M123.1 (Fig. 2), a small wooden item with a forked upper end, painted with a black stripe design on a yellow background. The identification as the wings of a bird, carried by a female offering bearer/estate figurine[42] (Fig. 3) is only possible on the basis of published comparison material or the comparison with the originals in the museum, respectively. Even more challenging are small wooden sticks: Sometimes, the decoration and specific design offer clues on their original position and function. An example are the small canopy posts (Figs. 4–5) found separately in the side chamber of the largest burial shaft in Tomb Siut III (M12.1). More difficult can be the interpretation of undecorated, plain fragmentary sticks, which may theoretically have been parts of the rigging of a model boat or upper ends of the handles of oars, as well as tips of model arrows or bows.[43]

42 On the discussion of "offering bearer" vs. "estate figurine" cf. Zöller-Engelhardt forthcoming.

43 Zöller-Engelhardt 2016: 26 with fn. 133. 164–168.

Fig. 4: Wooden model canopy post (photo: M. Zöller-Engelhardt, © The Asyut Project; cf. Zöller-Engelhardt 2016: 96–98, cat.no. M251–M255).

Fig. 5: Wooden Model Boat from the tomb of Nakhti at Asyut (Cairo, Egyptian Museum JE 36293; Chassinat/Palanque 1911: pl. 14.1).

These examples illustrate the every-day necessity of combining the work with the often insufficient publications of early excavators, which is also critically highlighted in-depth in the article by Henning Franzmeier in this volume. The research in museums and archives is demonstrated exemplarily by Cristina Ghiringhello and Marcella Trapani, too, as is the cautious reconstruction of disturbed find contexts on the basis of displaced, disturbed and fragmentary material, which Vera Müller clarifies comprehensively in her contribution on the situation of Abydos. In dealing with masses of sherds, Bettina Bader draws on a great deal of expertise from different sites in explaining how to deal with pottery stemming from utterly disturbed contexts. Fortunately, in the meantime, the methods of recording have changed and new technologies allow a handling of 'big data' as pointed out by Martin Odler. Methods have changed, too, and lead to more data gained by using new digital methods. Nevertheless, it is the specialist working with the respective material who has to analyze the data. Disturbed contexts and broken material still offer astonishing results, as is not only the case with pottery, but also with minuscule coffin ensemble fragments as shown by Charlotte Hunkeler or by 'valuing weights' as done by Silvia Prell and Lorenz Rahmstorf.

The examples described above clearly illustrate that the conceptualization of small finds naturally touches the area of archaeological classification, which has always been a focus of attention of advancing archaeological theory.[44] The underlying reason for any kind of archaeological classification – apart from practical, empirical and analytic purposes of the scientific process – is the wish of the researcher to better understand the ancient culture. Or, to be more precise, to further the insight into the interdependency of the material sphere with the way of life of the users and manufacturers of the classified items.[45] This process can be severely hindered by several factors as addressed above, like disturbed contexts, incomplete or biased publications by early excavators, the state of preservation of the finds and the accessibility of comparative material, objects without reliable provenance or too little resources (time, personnel, funding etc.). The contributions in the present publication address all of these factors and offer different solutions, suggestions and ideas for dealing with the challenges.

3 Topics of the volume

The present volume opens with an article on one of the largest and most challenging groups of finds, of which - despite its often fragmentary nature – a multitude of information can be gained: pottery. Bettina Bader's contribution provides an elaborate insight into the different aspects of her work in handling vast amounts of pottery. She comprehensively describes the necessary practical steps in analyzing ceramics and combines this example of her tested workflow with the theoretical background. Additionally, she emphasizes the crucial importance of documenting every step of the work process as accurately as possible and in a way that allows verifiability for fellow and following researchers.

44 Including typologies and taxonomies, cf. e.g. Rouse 1960; Adams 1988; Adams 1991; Read 2007; Read 2018. We thank Nadine Gräßler for literature references on archaeological typologies. On the challenges of taxonomies as subjective, modern 'Western' classification systems cf. for example Meskell 2004: 39–58.

45 Read 2018: 1.

She closes with a strong appeal on the importance of taking into account even the tiniest body sherd of a context which can influence the entire interpretation.

The topic of publishing highly accessible data is described by Martin Odler in his contribution on the need of an Egyptological data turn. He discusses digital solutions for dealing with (big) data gained through the analysis of larger groups of finds and emphasizes the necessity to not only publish the results of these examinations, but also the obtained data, preferably in a machine-readable format. This procedure should enable other scholars to approach the material under different research questions without having to carry out the analysis of the objects in question anew.

Naturally, early excavation reports may not provide the datasets we are used to nowadays, but nevertheless they contain invaluable information, especially since most of the sources of the data are no longer available. This information has to be considered by everyone working at a modern excavation site, but critically reviewed, too. This is especially stressed by Vera Müller, Henning Franzmeier and Marcella Trapani together with Cristina Ghiringhello.

Vera Müller underlines different factors when "re-excavating re-excavated material": She combines the information of the latest fieldwork results with that of earlier excavations, thus gaining additional and new insights on the historical sequence of events. Furthermore, she highlights the various influences tombs and objects are exposed to from the time of their deposition or manufacture until the moment of discovery or excavation. Hereby, she is able to demonstrate how even small burnt fragments give clues on the former use-life of tombs and their equipment.

Henning Franzmeier analyzes early excavations and early publications, stressing the need of a critical reading of these accounts. Focusing on the work of W.M.F. Petrie, he demonstrates the profits and limitations that arise by critically assessing publications from the early stages of archaeological work. Through his meticulous review, he raises awareness for the importance of further background knowledge on the restrictive and often biased decisions of former scholars to include or exclude objects or features in a publication. This can result in a distorted picture of the history of a site as further exemplified in his case study on Sedment.

Marcella Trapani and Cristina Ghiringhello demonstrate another challenge of working with small finds: the examination of unpublished objects with ambiguous provenance, in their case bone and ivory objects stored in the Museo Egizio in Turin. Their approach combines archival work with the study of early excavation reports and the analysis of objects from the related field work. By their interdisciplinary approach, they are able to point out the benefits of combining the results from material analysis and archival work to achieve a better understanding of the original context and function of the items. This leads to a deeper insight into the conceptual sphere of their usage and the way of life of their users and producers.

This crucial aspect is also central in the contributions by Silvia Prell and Lorenz Rahmstorf and by Charlotte Hunkeler. Silvia Prell's and Lorenz Rahmstorf's interdisciplinary approach shows the depth of insight that can be gained from investigating weights, a category that has not gained much scholarly attention so far. By precisely analyzing the distribution of shapes and the metrological system inherent in the weights, they are able to prove an Eastern Mediterranean influence on the Egyptian weighing system. Against the background of this adoption of a foreign metrological system, they are able to extract further information on trade relations and contacts between different powers.

Likewise illuminating are the results presented by Charlotte Hunkeler on her work on mi-

nuscule wooden fragments of coffins, mummy masks and mummy boards. Earlier excavations often deemed such fragments as not worth mentioning. However, the analysis of the sometimes tiny fragments allowed her to gain not only insight into the different phases of the use-life of the related tomb, but also resulted in the detection of an as yet undocumented manufacturing technique used in the production of parts of these objects.

All of these contributions demonstrate that methods and attitudes have come a long way since the early days of Egyptology. Moving forward from too restricting processual theories into fields of post-processual, ethno-archaeological and cognitive archaeology, researchers find themselves faced with the challenge of extrapolating broader explanations from the examination of material cultures. New approaches, new emic viewpoints and new technologies have paved the way for new reflections on the past. Yet, science always strives for further development and the present publication aims to provide useful information for like-minded professionals in the fields of Egyptology and Archaeology. It allows to see exemplarily how fellow researchers cope with difficult contexts and material to improve our understanding of the past, as well as help students in accessing challenging archaeological material. Thus, we hope to provide a small step into the work on the rich, but often challenging material of the culture of ancient Egypt and beyond.

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Finally, we also thank the participants of the workshop, first of all the speakers for their engaging presentations, the poster presenter, our chairs of the individual thematic sections and the audience for the lively discussions. Our special thanks go to Univ.-Prof. Dr. Willeke Wendrich for her inspiring keynote lecture. She emphasized not only the importance of working with small 'ordinary' finds, but also reflected on the constant flux in archaeological methods, techniques and theory, also addressing the colonial past of the discipline and the emergence of community archaeology.

In 2020, SARS-CoV-2 and the pandemic evolving from it hit the world and affected the lives of millions of people. One of the side-effects were several temporary lockdowns which impeded research considerably. We are grateful that despite all of the hindrances this publication could be finished. We thank all contributors for their persistent efforts in the publication process during these very difficult circumstances.

Papers presented at the workshop „Excavating the Extra-Ordinary. Challenges & Merits of Working with small finds", Mainz, 8–9 April 2019

Bettina Bader:
From knobbly bits to complete vessels – information contained in finds made of clay

Paolo Del Vesco:
Excavating and curating "disturbed" contexts

Henning Franzmeier:
"...half a loaf is better than no bread". On the fragmentary nature of early archaeological publications and their utilisation in the 21st century

Cristina Ghiringhello & Marcella Trapani:
Bone and ivory carvings preserved in the Museo Egizio in Turin – Interdisciplinary approach

Charlotte Hunkeler:
A Ramesside coffin ensemble: what information can be gained from fragmented and incomplete material?

Chiori Kitagawa & Silvia Prell:
The bone workshop of the armoury of the chariotry of Ramesses II in Qantir-Piramesse

Clara Jeuthe:
Objects in space – spatial analyses at Elephantine and Ayn Asil

Manuela Lehmann:
Amara West: ancient fragments from a modern perspective: an ethno-archaeological approach

Vera Müller:
Re-excavating re-excavated materials – A case study from the royal necropolis of the Early Dynastic Period at Umm el-Qaab/Abydos

Martin Odler:
On computers, typewriters and small metal finds

Silvia Prell & Lorenz Rahmstorf:
The value of weights – what they can tell us about economic changes and changes of power

Johanna Sigl:
Dem bones, dem beads, dem botany ... Dealing with mass finds from the settlement excavations on Elephantine, Aswan

Leslie Anne Warden:
But it's just another body sherd... Thoughts on ceramic processing from two Middle Kingdom settlement sites

Katharina Zinn:
Narrating the Extra the Ordinary has: "Re-excavating" objects in storage rooms of local museums as part of an archaeology of unloved object

Keynote Lecture: Willeke Wendrich
The Ties that Bind: Excavating the Extraordinary

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From Knobbly Bits to Whole Vessels – Information Gleaned from Pottery from Large Disturbed Contexts

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Pottery represents the largest find group in almost all excavations in Egypt. Whilst not every context type can, or should, be treated in the same way, each of these provides data and insights into the history of the site under scrutiny. Besides dating, typology and functional issues can also be highlighted as well as raw material distribution, history of technology and units of measurement.

Even very broken material in surface contexts informs us about the periods in which activities took place, because the general sequence of pottery development is well researched, so that, at the very least, a general date can usually be proposed. This is not to say that no more progress and refinement can be achieved or that new research is superfluous in the light of advances in research method and technology. The practice of dating by parallels from other sites is to a certain extent problematic especially in transitional periods because an absolutely uniform time horizon for certain pottery types seems to be the exception rather than the rule as well as total conformity in technology as well as in typology across Egypt and Nubia.

Methodology in processing, data collection and ways to tease out information from the smallest pieces of pottery including material from drill cores is also discussed. Last but not least the controversial topic of discarding ceramic material will also be debated.

1 Introduction

The purpose of this article is to draw attention to the type of information and data inherent in pottery finds from large and disturbed contexts and how to unlock it for the benefit of the archaeological interpretation of a site.[1] The strategy to be chosen and followed depends, of course, on the type of the site, the amount of material recovered and the financial means and team power of the project to collect, process, record and interpret pottery data. It must be made clear in this instance that a good result can only be obtained

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1 At this point I would like to thank Andrea Kilian and Monika Zöller-Engelhardt for their initiative and the organisation of the inspirational workshop "Excavating the Extra-Ordinary" at Mainz. My thanks go to D. Aston for correcting my English. All remaining mistakes are my own.

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with full support for the ceramicist as the process of collecting the data is not particularly complicated but is time consuming and therefore a major financial factor. It must also be stressed here, that current developments to officially forbid the storage and safekeeping of pottery in safe places in Egypt jeopardise the best possible collection of data and as a knock-on effect the knowledge to be gained from this immensely important source. This political move even threatens material from secure contexts, which is so rare and so valuable for Egyptian Archaeology. Without this input of data, we might as well stop research, because if the most ubiquitous source type is missing any result gained by archaeology will be compromised. Therefore, this article should also serve as an appeal to stop this development because we will lose the backbone of archaeology – the pottery as well as other broken finds as a vital source. This would definitely throw us back to procedures common at the beginning of the 19th century AD, when archaeology in Egypt was all about colonial hunting for treasures for museums in the west.

It is not the intention to duplicate previous work on functional aspects of pottery[2] or quantification[3] but to give a brief overview of the types of data elucidating ancient activities[4] at any given site from large and disturbed contexts that may otherwise remain invisible and lost to research. The simple reason is that human activities in ancient times are very often carried out in connection with pottery. Turned on its head this means, where ancient pottery was found, there is a high probability that human activities had taken place. This fact is relevant not only for large surface contexts but also for the microcosm of material recovered from augering (see below).

2 Types of information to be gained – general benefit

The evidence from pottery collected from large and most probably disturbed surface contexts can be summarised as follows. The scrutiny of **all** sherds found provides hard data on the variety of pottery fabrics having been used at the site, as well as on surface treatments, and manufacturing technologies. Already at this stage of excavation some conclusions about a rough estimate of use periods can be undertaken, which may prove essential for further planning of excavation – e.g. concentrations of sherds of uniform date as focus for intended future work. It is immediately roughly apparent which periods occur because the pottery develops sufficiently to divide the ceramic material even from the surface: the Pre-dynastic-Early Dynastic, Old Kingdom, Middle Kingdom, New Kingdom, Late Period to Ptolemaic, Roman and Late Roman to Islamic and this knowledge is widely distributed among scholars and ceramic specialists. Depending on the nature of the site it may be necessary to wash the ceramic material - with utmost care and scrutiny - to see if dockets or ostraca are present. Most likely the pottery from the surface is broken (although that is not always the case), but even the smallest sherd of a Late Roman Amphora 7[5] vessel is recognisable as well as that of a Meidum bowl[6] or an Old Kingdom 'beer jar'[7].

Beside the use of surface finds to roughly date the activity periods at the site[8] at least in the beginning of the archaeological work, the occurrence of certain fabrics – especially Marl clay

2 Bader 2013: see also for bibliography.

3 Bader/Kunst/Thanheiser 2008; Bader 2010; see also for general bibliography: Bader 2016.

4 Some of the points are mentioned in Bader 2017.

5 E.g. Peacock/Williams 1986: 204–205; Pyke 2005 with references.

6 Op de Beeck 2000 with references.

7 E.g. Rzeuska 2011 with references.

8 That such an endeavour is entirely possible and feasible has been shown by Rzeuska 2017, who used a large body of uncontexted material that was not too fragmented. See also Bader 2019 for a review.

fabrics – should be noted in order to produce a dense distribution network of raw materials. While for Nile clay fabrics such an approach is more problematic without scientific testing, because macroscopically the petrofabrics often look very similar to the unaided eye or under 10 x magnification, the Marl clay fabrics provide a better chance of identification by means of using macroscopic methods (although, obviously, scientific testing would be an asset[9]). In this way it is possible to draw distribution maps of raw materials and to better understand the production and transportation modes of marl clay pottery as well as distribution of vessels made of certain materials. In this question, quantification is of more importance due to the thought that any given raw material is most frequent close to the site where it had been produced.[10] Whether surface pottery should also be quantified depends very much on the specific nature of the site[11] and most definitely needs the keen support for the ceramicist by the excavating team. However, the disturbed nature of the material needs to be made clear and consequently the limitations of the validity of any results for the interpretation of the site. In general, quantification serves to answer the question how many? in any type of context. As one example I can quote the situation to the north of the Temple of Millions of Years of Thutmosis III in Qurna, where depositions of tons and tons of pottery were found. Initially, it was not clear whether this was a modern deposit, or an ancient one and it turned out that at least in some stretches the deposit had been initiated in antiquity with exclusively contemporary or roughly contemporary material.[12] The predominance of Holthoer's BB jars[13] led to the development of a specific recording form (Fig. 1), which was entirely devoted to cope with the immense frequency of this vessel type and get some analytical results from this deposit in a reasonable way. The result of this scrutiny is a robust data set of the frequency of occurrence of fabrics, base diameters, the frequency distributions of the various base types as well as the presence of pierced bases in this material. The other example comprises shaft fills from Deir el-Bersha, which were quantified although it was known that they were disturbed from antiquity up to the very recent past. The task was to have a means to compare the character of different shafts quite beyond the fact that they were severely disturbed. The results show that each of these shafts has a different set of characteristics, which opens up possibilities for interpretations.

The variety of pottery types and shapes can best be tackled by dividing the diagnostic pottery fragments from the less diagnostic body sherds if there are no joins to be found: here the rims, bases and handles have predominance, but also painted, incised and otherwise remarkable fragments should be collected and studied. From this body of material a preliminary typology of vessel types occurring can be arranged to be used as an open type corpus after Petrie's practice[14] to which more shapes and rim and base variants can be added as the work progresses and thus a useful catalogue of pottery vessels and parts thereof can

9 Considering the cost of such scientific analyses as well as the difficulties met to try and do so in the modern Egyptian context, it would be advisable to use such methods rather for well contexted material with a recognisable shape. This would serve to connect certain fabrics with certain shapes rather than testing only more ambiguous surface sherds. The strategy depends on the circumstances of the site.

10 See for example Arnold 1981.

11 Op de Beeck 2006 for an example of quantification of a spoil heap, where such a study was usefully applied.

12 Bader/Seco Álvarez 2016: 247–249, 253–256. This circumstance could be tested by means of a small trench (1.0 m by 1.0 m), from which all ceramic fragments were collected and recorded.

13 Holthoer 1977: 86–88, fig. 18.

14 E.g. Petrie 1921; Petrie/Brunton 1924.

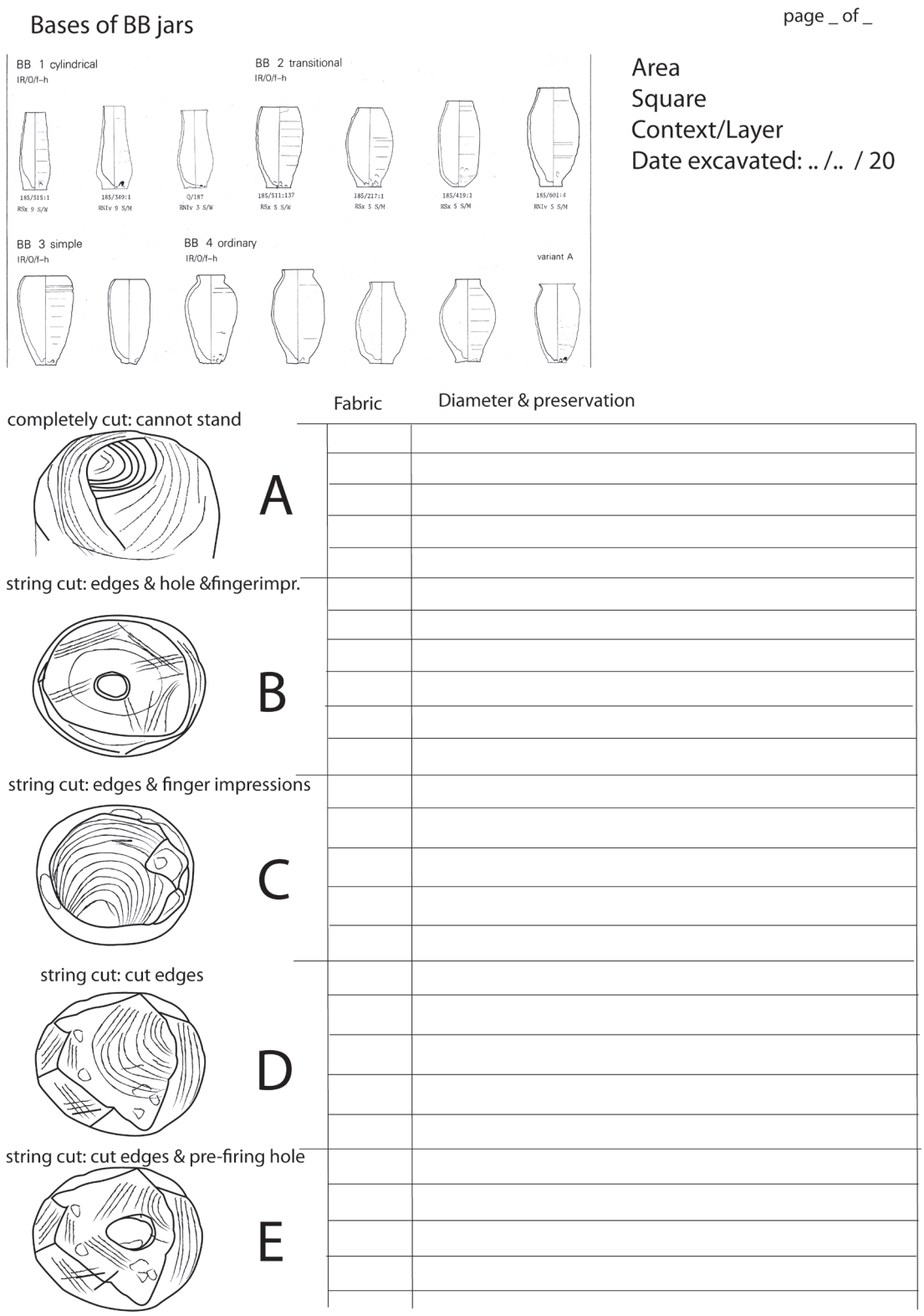

Fig. 1: Recording sheet designed for the recording of Holthoer's type BB.

be produced for immediate reference and later publication. While most likely the type corpus from surface layers consists of fragmented material and is therefore of a certain ambiguity, it is of vital importance to know which shapes are present in the material to allow a judgement of function of the site. For frequently appearing pottery types the introduction of special recording forms may be viable, especially if the degree and date of disturbance of the context is not clear. The benefit of creating a typology connects again with a more secure means of general dating, because the pottery types can be better defined and also paralleled at other sites. For dangers of exclusively relying on dating by external parallels see below. Moreover, the typology provides evidence for the activities conducted at, and functions of, the site (open and fine table wares – consumption of food; closed, large vessels for storage; pottery used for cooking; bread moulds for a bakery; even very specific insights such as e.g. vessels for animal mummies or the ubiquitous Late Antique 'pigeon pots', etc. to name but a few[15]). The distinction of size classes in pottery provides information on measurement systems as certain sizes might be related to inherent systems of units about which other sources do not come forward.

The scrutiny of the manufacturing technology in the widest sense (including *chaîne opératoire*[16]) gives clues on the history of technology on a general level and the organization of pottery production (mass production versus small scale individual production) on a more specific level. For example the presence of 'touching stains' on pottery in regular places proves the firing in a kiln situation in larger batches (Fig. 2). In general, the technological sophistication used for pottery production is also a splendid marker for dating the material, especially in the earlier periods of Egyptian history, such as the Predynastic up to the New Kingdom.[17] This does not mean, of course, that early pottery cannot be made to a very high level of quality. Some technologies, on the other hand, can with certainty be dated to later periods, such as material with diagnostic narrow ribbing, which is derived from using a fast wheel.

Fig. 2: Kiln stain on a vessel from the Egyptian Museum Berlin ÄM 18718 (© Courtesy of the Egyptian Museum Berlin, photo: C. Knoblauch).

15 See for more detail on this question Bader 2013; Sullivan 2013: 113–137 with references.

16 Leroi-Gourhan 1993; De Vreeze 2016.

17 Bourriau 2006.

While scientific analyses,[18] such as chemical analysis, petrography, pigment analysis, residue analysis and x-ray technologies used for the study of provenience, surface treatment and contents analysis of pottery might be applied to material from closed contexts, it is usually not considered viable for finds from the surface due to high costs. Exceptions may be made for particularly unusual vessels/vessel fragments. Also x-ray technologies e.g. x-radiography and Computer Tomography (visibility of technological details) may be used for exceptional material to add knowledge.

While much information can still be collected even if the 'context' is as vague as 'disturbed surface' (Fig. 9) such as the nature of activities (filling up to raise levels, depositions of waste, cooking, cultic activities) and certain functions (storage, dining, cooking, offering, cultic activities, etc.), a clear statement of the duration of activities in certain places and specific locations may not be possible or is at least compromised.

The study of re-used and worked pottery fragments should not be neglected, as this re-cycling habit – a very ancient social practice currently particularly relevant – is still not very well understood, because the tools and objects made from disused pottery are either not usually collected and studied in their own right for recording and publication or they are already separated from the contexts they were found in so that this aspect of pottery tools is not obvious to the ceramicist.[19] These finds provide vital clues for the social practice in ancient times, which will continue to be missing if research ignores them.

Finally, the distribution patterns of pottery, even when it is broken, provides clues on post-depositional processes such as frequent movement either by human or natural agency. Especially the detection of cross joins between contexts elucidates the connection between assemblages that are conceived as contexts but might have been mixed more frequently than it appears during the actual excavation.

The interpretation of all of this data feeds into the dating of the pottery within the periodization of Egyptian history from the Pre-dynastic to the Late Antique Period and up to modern times. It is a commonplace to state that pottery changes over time in a number of characteristics, by which it can be identified and compared with other sites and dated accordingly. However, awareness should be raised that searching for external parallels and dating the pottery of one site exclusively by parallels from others leads inevitably to circular arguments. Thus, in a best case scenario the information from large disturbed contexts is there to be used additionally to the contexted material and not on its own. One could say the scrutiny of large surface layers gives a précis of activity periods and the nature of activities conducted before proper excavation proceeds although in some cases it might provide all data available (e.g. when sites are destroyed).

2.1 What and how to record? Data collection – a personal view

The following is a sketch of the kind of data routinely collected and the kind of results expected. Of course, there are other ways of analysing ceramic material, and often time constraints are such, that not all of these areas can be covered.[20] Nevertheless, it is hoped that the examples given below serve to demonstrate the immense possi-

18 The following references are only intended to give a start and are not thought to list all possibilities available: Bader 2017; Ownby 2011; Ownby 2016; Tschegg/Hein/Ntaflos 2008.

19 One notable exception Raedler 2007 for scrapers. Often material has been collected but never published, e.g. in the settlement finds from a late Middle Kingdom settlement at Tell el-Dabᶜa. Cf. Bader in preparation.

20 Arnold 1985; Sinopoli 1991; Rice 1987; Orton/Tyers/Vince 1993; Orton/Hughes 2013.

bilities inherent in pottery as source material, rather than to view it as a nuisance that has to be dealt with as quickly as possible and can then be safely discarded in a deep dark hole never to be seen again. Not only does that defeat the scientific requirement to make results reproducible, but also other ceramicists and other scholars will not be able to study pottery corpora from specific periods and sites: a tragic loss of the opportunity to build up site specific study collections for teaching and research purposes. Moreover, if the material is dumped in its entirety there is no way to be able to fulfil scientific demands of reproducibility and repeatability of results, which compromises not only specific results but the whole field of Egyptian archaeology.

2.1.1 Fabric

The single most important descriptive property of fired pottery is the raw material: the fabric or as it is called in petrography, petrofabric.[21] In the current understanding this consists of the raw material and any natural or artificially added inclusion with the characteristics acquired during the process of firing, such as colour, hardness and porosity.[22] The best known fabric classification system in Egypt is the so-called Vienna System.[23] It has to be stressed that this classification system was agreed upon as a reference system for comparative purposes rather than as a fabric classification system in its own right to be used at every site regardless of the historical period(s) occurring at Egyptian sites. This is simply not what the Vienna System was set up for. Thus, every site and period needs their own fabric classification system, even more so as for example the predynastic period[24] is quite different in terms of raw material from the classic pharaonic period[25] and Late Antiquity.[26] Also there may be regional variations that are otherwise lost, if immediately the Vienna System is used instead of a local, site specific fabric classification system, which is specifically adapted to the site under study and later given as correspondence to the Vienna System.[27] Moreover, different periods see the advent of different fabrics, and this is particularly obvious with Egyptian Marl clay fabrics. Scholars have noted that the Vienna system does not work for them, but it was never thought to be universal for all periods and sites.[28]

Continuously collected evidence on the marl clay fabric 'Marl C' as classified by the Vienna System[29] shows that the distribution of vessels made of certain fabrics within Egypt and also outside of it gets better known and allows glimpses on commodity exchange patterns, which are otherwise very remotely known and only for very restricted periods. Since the last comprehensive distribution study the material was also identified[30] in Egypt at Tell el-Retaba,[31]

21 Köhler/Ownby in press.

22 Nordström/Bourriau 1993: 40.

23 Nordström/Bourriau 1993; Bader 2001; Bader/Knoblauch/Köhler 2016; Bourriau/Bellido et al. 2006; Bietak 1991b: 317–333.

24 Köhler 1998; Köhler/Ownby in press.

25 For the New Kingdom also other fabric classification systems exist: Bourriau/Aston 1985; Bourriau/Nicholson 1992; Bourriau/Smith/Nicholson 2000.

26 Bader/Knoblauch/Köhler 2016; Köhler 1998; Gates-Foster 2012; Pyke/Ownby 2016.

27 Bourriau/Gallorini 2016: 22–37; Budka 2017: 120–126 as example.

28 Nordström/Bourriau 1993; Bader/Knoblauch/Köhler 2016.

29 Nordström/Bourriau 1993: 179–180; Bader 2001; Bader 2002; Bader 2009: 646–652.

30 Unfortunately, at many sites only a macroscopic identification could be done, as petrography and other analyses were not possible. It is hoped that these analyses proving or disproving the presence of that fabric at these sites can be conducted soon.

31 Seen at a site visit in 2019. Rzepka/Hudec et al. 2014: 97–98.

Sedment,[32] Kom el-Hisn,[33] Abu Ghalib,[34] Heliopolis,[35] Deir el-Bersha,[36] Asyut,[37] Qau el-Kebir,[38] Western Thebes,[39] Hierakonpolis,[40] Edfu,[41] and Elephantine[42]. In Nubia it has been reported at Toshke,[43] Gebel el-Asr,[44] Debeira East,[45] Uronarti,[46] and Kerma[47] as well as in the Levant.[48] The vessel types found belong to the pottery repertoire of the Middle Kingdom and the Second Intermediate Period. Although the distribution pattern of that material was already known along these lines, the additional data show that the material was in much wider use than hitherto acknowledged. The importance of this data for the economic history goes well beyond the scope of this short article but renewed scientific analyses should be undertaken to scrutinise whether the oft repeated dogma of the exclusively northern origin of Marl C in the Memphis-Fayoum region is actually tenable.[49] The many visual varieties of the fabric group observed over the years in terms of colours, firing variants and spread of inclusions as well as the long use period (Old Kingdom to beginning of New Kingdom) might suggest a series of workshops rather than a single one (or a group of workshops spatially close together) but only more petrographic as well as chemical analyses can clarify this question as well as the discovery of a kiln site.

The way to set up a fabric classification system is to begin observing fabrics macroscopically by means of simple stereoscopes with a magnification of up to 30 times and keeping a standard sample collection for continued visual comparison, which may be developed over time and ideally submitted for scientific analysis as soon as viable to check whether the visual division is congruent with the petrographic result. The most obvious divisions to start with in Egypt are alluvial clay fabrics, marl clay fabrics, imported fabrics (Levant, Cyprus, Nubia) and others that do not fit into these categories, for example mixed clays which are problematic to identify in any period.[50]

It is worth thinking about possible divisions the ancient potters might have made as the modern classification exclusively helps the modern ceramicist to categorise ancient but human made relics rather than a natural taxonomy as for example for animal bones. Because it is a human product there is no 'natural evolution' as in any biological remains. Observation of the same vessel types made of fabrics that the ceramicist divides but not the ancient potter might reveal hidden connections and social processes.

32 Identified among the material excavated by Brunton and Petrie during 1920/21 in the Royal Museum of Art and History, Brussels, with many thanks to L. Delvaux and I. Thalasse.

33 Wodzinska in Wenke/Redding/Cagle 2016: 297.

34 Bagh 2012: 29.

35 Ahmed Mahmud/Faris et al. 2008: 195–196, 204.

36 Willems/De Meyer et al. 2004: 253 and multiple incidents seen personally since 2013.

37 Rzeuska 2017: 438–439.

38 Visually identified by Bader among surface debris during a site visit in 2013.

39 Seiler 2012: Fig. 4, 7. Visually identified by Bader among surface material cf. Bader/Seco Álvarez 2016: 161, 222, 224.

40 Giuliani 2004.

41 Ayers 2018: 65.

42 Personal involvement in the Elephantine project (with the *Swiss Institute for Architectural and Archaeological Research on Ancient Egypt, Cairo*) since 2017 in addition to Von Pilgrim 1996.

43 Bader 2006 among ceramic material excavated by Junker.

44 Shaw/Bloxam et al. 2001.

45 Personal communication 2019, A. de Souza.

46 Personal communication 2013, C. Knoblauch.

47 Bourriau 2004: 8–12.

48 See Bader 2015 for the collected evidence with detailed references.

49 See also Bader 2019.

50 Rzeuska 2006: 522–536.

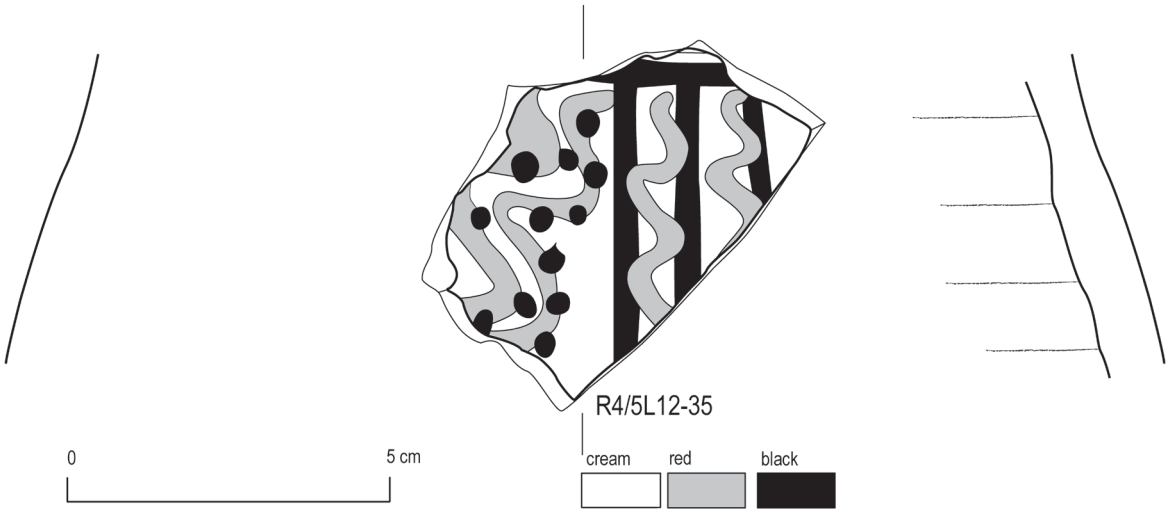

Fig. 3: Drawing of a painted sherd (after Bader/Seco Alvarez 2018: Fig. 48e).

2.1.2 Surface treatment and decoration

The definition of 'surface treatment' includes any steps after the manufacturing process proper with the aim to reduce porousness and to enhance the finished product, i.e. to remove (some of) the traces of the manufacturing process or to decorate the vessel to make it look more appealing to presumptive customers.[51] Sometimes it is not easy to decide whether appearances of vessels are intentionally produced or if they are brought about by firing.[52] Just as an example the white surface of some marl clay vessels may be mentioned, which had previously been described as a 'white coating' of some sort or a 'self-slip' before it could be proved that this effect is often brought about by chemical reactions during the drying and/or firing process.[53] It is also not easy to know whether a vessel had been wet-smoothed or wet-finished after the manufacturing process, because the wet smoothing might just have been a final brush over of the vessel with the wet hands of the potter as the same material is used as for the body of vessel. The term self-slip is avoided here for wet-smoothing as this is often defined very vaguely and used for widely different features.[54]

However, the classification of the surface treatment allows an opinion on the quality of the vessel under scrutiny and the effort expenditure afforded for each single item. Moreover, certain surface treatments and decoration types such as incised pattern or painting are more common in certain periods and thus, corroborate or refute an opinion about dating, e.g. blue painted pottery or decoration of pottery with black bands around the rim of vessels, most often on a dark red overall slip and many more. It seems superfluous to list all possible surface treatments and decoration types[55] especially as they change over time but I would like to focus on painting of vessels. Especially in the New Kingdom more complicated patterns are in use for vessel decoration and the observation of the *chaîne opératoire* of the painting process allows perhaps in the long

51 E.g. Sinopoli 1991: 23–27; Arnold 1993: 85.

52 Still this would imply that the ancient manufacturers knew very well about the properties of the material they were using.

53 Ownby/Griffiths 2009.

54 Arnold 1993: 85; Pape 1991: 55, 67–68.

55 Arnold 1993: 99–102.

run the identification of several workshop traditions or even single painters. This may be achieved by observing the overlaps of the single elements of the painting (Fig. 3). In this example first (a) the cream slip was applied, next (b) the black vertical lines, then (c) the red vertical wavy lines, (d) the black dots. When exactly the black horizontal line was added is currently not clear, but most probably between (a) and (b). In a similar manner the exact description of the patterns of ring pattern burnishing (fastest by digital photography) that is not always perfectly round has not been undertaken at different sites or regions. So we do not have information on the variety in this decorative pattern yet, and whether it might contain any meaning hitherto missed in the interpretation currently followed (Fig. 4). This figure suggests subtle differences in the way the rings are made: they could be derived from various potters, various work-shops or even various regions. To be certain which explanation is the most reasonable, we need more data and from more regions and to analyse it carefully.

2.1.3 Manufacturing technology

The detection of the *chaîne opératoire* of the manufacturing process of pottery vessels goes a long way towards finding out about the organisation of pottery production, the organisation of the mode of distribution of the finished product, and – most importantly – of the dating of the pottery. The process of producing pottery underwent an 'evolution', roughly and almost dangerously simplified, from entirely handmade to entirely wheel-made/wheel-turned,[56] the increasing use of *Rotary Kinetic Energy* (RKE)[57] and finally the production of pottery entirely made on the kick wheel.[58] The very rough dating of purely handmade vessels and those in combination technology can be set prior to the New Kingdom, while entirely wheel-made vessels occur more frequently after the beginning of the New Kingdom. Nevertheless it needs to be stressed that this transition is not smooth and clear cut and coincides with the transitional period of the later Second Intermediate Period to the early New Kingdom, again a historical division that is largely made up by modern scholars. Moreover, even after the beginning of the New Kingdom there are exceptions[59] and difficulties, which prevent us pinpointing an unequivocal date for the change from combination technology to entirely wheel-made pottery vessels. Thus, this development is not absolute and should not be viewed in a Darwinistic, teleological way.[60] There are always exceptions and difficulties as well as transitional periods, when more than one technology is used at the same time, for example trimming bases of jars with a tool by hand and turning the jar over on the wheel and trimming it with a tool horizontally using *Rotary Kinetic Energy* (RKE) which produces deep horizontal scratches in the area towards the base (Fig. 5). In general, it is unrealistic to expect that technological changes coincide neatly with different Egyptian Dynasties, as Dynasties are a retrospective, later concept and technological changes are induced by different processes than purely political ones. Moreover, such changes are also not always induced by innovations coming from

56 Beware of the fact that for turning lines no wheel is necessary: a turning device such as a bowl in a basket or a wooden board on a basket already provides momentum for wheel-aided turning.

57 Courty/Roux 1995.

58 Arnold 1993: 16–17, at least in the Late Period, but unclear when it started; Bourriau 2006. See also Klotz 2013, who found a depiction of a kick wheel in the Ramesside period in hieroglyphic signs. Unfortunately the pottery of that time does not look notably different to what was used before in terms of visible manufacturing processes. A real difference can be observed in pottery in the Late Period.

59 Aston 2020, in press.

60 Loney 2007; Loney 2011.

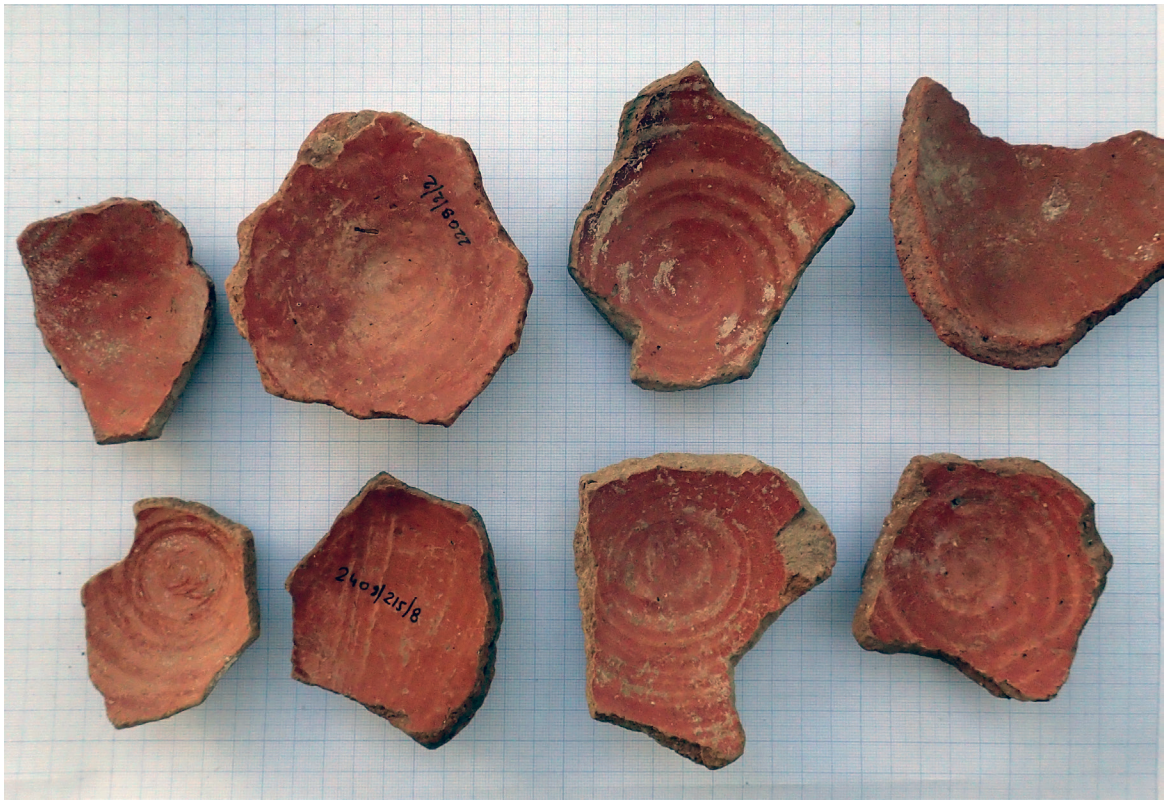

Fig. 4 : Variety of ring pattern burnishing (© Courtesy of KU Leuven Dayr el-Barsha Project, photo: B. Bader).

Fig. 5: Bases of jars: left trimmed obliquely with a tool; right trimmed with a tool on a turning device (© photos: B. Bader).

outside the local cultural environment, but they may be rooted in specific uses or developments of specific vessel types.[61] At the same time ancient techniques may be kept because it is necessary for specific reasons or material constraints, for which the improved technology did not provide a solution after all. The actual date of the widespread use of the kick wheel is also not particularly clear. It should also be stressed that even in the Late Period pottery is also produced using the 'normal' wheel.[62] Perhaps scientific methods such as xeroradiography or computer tomography may help to clarify this point in the future. However, the difference in manufacture between Pharaonic pottery and Graeco-Roman, Late Roman and Medieval productions can be used to get an overview for a rough periodization of a given site.

2.1.4 Diameter and preserved percentages (for quantification)

The detection of the diameter or other diagnostic features as well as diagnostic fragments (if necessary with a diameter chart[63]) allows the division into size classes and, as well, the measurements of the parts preserved and therefore quantification.[64] Although I would not like to go into detail here, it is important to state how many specimens of one given type are represented for a reasonable interpretation of archaeological features such as cooking installations, storage facilities or the like. Also in comparative studies of any type quantity has an important role to play.[65] Suffice to say that most methods here have their merit in certain situations, but that simple sherd count is the worst approach because it is not a stable measurement: for an assessment of how broken pottery is in combination with weight on the other hand, it can be considered as useful, because this correlation gives evidence about the post-depositional process and leads to a better understanding of the fate of the material.[66] Quantification by means of minimum and/or maximum number of vessels represented makes sense if the pottery is fairly well preserved, because it is important to be able to assign pottery vessels or vessel fragments to types. The wider these types have to be defined due to small fragments from high breakage the less stringent any analysis can be applied. Material from surface layers is often very numerous and very broken and therefore the time consuming process may not provide a particularly useful result. 'Estimated vessel equivalents'[67] have the great advantage that there is no inherent bias due to vessel size or wall thickness. 50 % of the rim of a small vessel can be considered as the same quantity as 50 % of the rim of a large one. Problems arise for vessels with irregular rim shapes or heavily asymmetrical ones. Moreover, it is very easy to collect the necessary data with a diameter chart also including the percentage grid (Fig. 6).

2.1.5 Vessel shape – drawing or typing?

The best method to learn about vessel shape and vessel morphology (and incidentally manufacturing technology as well) is to record ceramic material by means of drawing it. No particular drawing skills are necessary for this type of drawing, as it is purely technical following a convention, to record certain properties of the vessel shape and the technology, because some details of shape are much easier to visualise than to describe with words. This recording process should also be done

61 Van Oyen 2017: 55–57.

62 I would like to thank D. Aston for drawing my attention to this fact.

63 Orton/Tyers/Vince 1993: Fig. 13.2.

64 Bader 2016; Orton/Tyers/Vince 1993.

65 Bader 2009.

66 Orton/Tyers/Vince 1993: 166–171, 178; for a use of this data see Bader/Seco Álvarez 2016: 199.

67 Bader 2010: 62–63; Orton/Tyers/Vince 1993: 171–173.

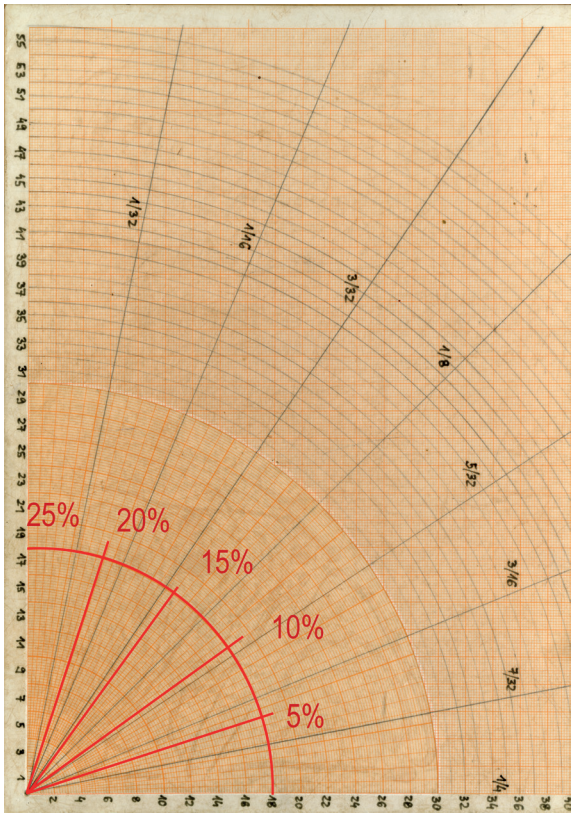

Fig. 6: Diameter chart with percentage divisions.

by the ceramicists themselves because, at least in the beginning of analysis at a new site or in a new period the best way to know is to handle the material for long enough to know how to identify it also by means of the finger tips. The tactile experience of objects is one of the most important aspects in recognising them. Thus, it follows that identification of pottery done by means of publications alone, can never be as certain as having seen and handled it. This experience is all the more valuable when it comes to identify various pottery types from very small fragments, which are in the end decisive about dating assemblages.

Recording a lot of ceramic material from a multitude of sites of roughly the same chronological period led to the realisation that generalisations across the whole area of Egypt are often not valid and that a diachronic regional view from intact contexts provides a better starting point to understand the material and its regional developments better. Recent research, for example, led to the observation that the bases of hemispherical cups, a hall mark of the Middle Kingdom and the Second Intermediate Period shows different patterns of base trimming in various regions. While we know for some time now, that the vessel index of such cups[68] is an important descriptive element for the pottery itself, it is not a given *a priori* that similar vessel indices indicate the same shape and the same manufacturing technology. At Memphis for example a type of round based cup develops over time that has a much thicker base and a different pattern of finishing the base on the exterior than in the previous period at Memphis[69] and at other sites. Most importantly their vessel index resembles more the earlier cup series at other sites, because instead of more closed the development reverts and the shape becomes again more open especially in the period after the Middle Kingdom.[70] Similar differences can be observed at Deir el-Bersha, where the cups are smaller with a different base finishing pattern.[71] The more research is conducted at Second Intermediate Period sites the more the diversity in the morphology of the cups becomes clear in the various regions of Egypt. Thus, a simple correlation of vessel indices does not work for a chronological synchronization especially if there are only a few.[72] Only a close look at a lot of vessels brought about this knowledge.

68 Arnold 1982: 60–62; Bietak 1991a: 49–50.
69 Bourriau/Gallorini 2016.
70 Bader 2007; Bader 2009: 281–285, type 28d2.
71 Bourriau/De Meyer et al. 2005: 118–120.
72 Bader 2009; Ballet 1990: 25–28; Bourriau/Gallorini 2016: 40–41; Rzeuska 2017: 157–159; Bader 2019; Von Pilgrim 1996: 186–188; Seiler 2012: 318–319, Fig. 19.

One of Petrie's darker legacies is the ongoing division and specialisation in finds according to raw material (pottery, stone vessels, textiles, wooden implements, etc) overriding the importance of the original assemblage (as found) for archaeology in Egypt,[73] which still persists and often leads to circular arguments as conclusions found by means of one material group often feeds back in the same context and is then re-applied. The other great problem is the culture-historical corpus approach, where only one specimen is shown and properly recorded while the numerous others are just seen as variations of this one proto-example and not separately recorded and drawn. Thus, we only have an overview of a small percentage of the actual material excavated. While typing, the notation of virtually the same kind of vessel or vessel fragment was contemplated in order to save time and recording resources, to actually draw the piece is often faster than to deliberate whether it is dissimilar enough to warrant its own drawing (especially when complete profiles are preserved). With hindsight I would insist on drawing all complete profiles as a record as well as a good sample of vessels and vessel fragments of each stratigraphic unit (ideally)[74] or chronological group (in case the context is from the surface). Such methodology prevents typing across stratigraphic units or chronological groups, which would compromise the result of the analysis.

2.1.6 Recording of special features

The scrutiny of use traces such as smoke blackening, certain intentional abrasions, pre- and post-firing holes, pre- and post-firing marks, etc. provides crucial information about how vessels were used in daily life. Not so long ago Egyptian pottery was not described routinely when scorched and smoke blackened for example, so that for some periods it is not clear if cooking vessels as separate types existed or if vessels were used arbitrarily for that purpose. Also it is not possible to ascertain whether vessels depicted in cooking scenes in tombs were really found with smoke staining and thus corroborate the pictorial sources.

The rounded black/grey/reddish dis-colourations of the surface of pottery vessels termed kiln stains or touching patches have already been mentioned before, but they allow the observation that multiple pieces of pottery were fired together at the same time in batches proving serial manufacture. Whilst this is perhaps obvious, it is also nice to have proof for it.

The recording of the weight of pottery has increased in the past decade and the use of this measurement, which is quickly to obtain and stable and free of bias if the fabric groups are compared with each other has been used for some interpretations of material: in combination with sherd count it is possible to ascertain whether pottery of a certain fabric group is more broken than a comparable assemblage and allows inferences of post-depositional destruction and movement of material.[75]

Increasingly the documentation of details is done by digital photography, replacing time consuming drawing processes and allowing quick documentation. This is not to say that digital photography should replace old-fashioned recording by drawing because the haptic experience of exploring an object first hand cannot be easily replaced. To touch an object is very much connected to the overall experience to know and recognise it and no technological progress in 3D scanning technology can replace such kind of knowledge.

73 Van Oyen 2017: 55–56.

74 Bader 2009: 72 for typing fragments.

75 Orton/Tyers/Vince 1993: 171–173, 179; Maxwell/Peacock 2006: 5–6; Puschnigg 2006: 46.

3 Degree of preservation and information gained

Although ceramicists continuously stress that analytic work should concentrate on diagnostic pieces such as rim and base fragments, handles, decorated pieces etc. it also needs to be put in writing that body sherds do have their information value by their sheer presence: Old Kingdom Maidum bowl body sherds are almost as unmistakable as are body sherds of Late Roman Amphora 7 (ribbed or not). They point directly to a longer era, even if it cannot be said where exactly within it. That is most valuable information which should not be thrown away lightly. This fact is also of particular importance for work with material from drill cores, where well preserved diagnostics are rarely to be found. Crucially, anything that is not immediately known should be kept for study because it may become clearer later, after having seen more and perhaps more complete material. Thus, the 'unknowns' will become less over time.

Complete vessels give the most precise information about ceramic receptacles, while fragmented material can generally be divided into open, closed and restricted vessel types as well as some subgroups. These categories, albeit very broad still allow inferences on functions of the archaeological features but the ambiguity is much higher so that circumspection has to be applied when the final summary of the analysis is composed because often one rim fragment may belong to more than one vessel sub-type.[76] Despite these difficulties it would be wantonly negligent to disregard the information from broken and incomplete material, a point that sadly seems to need stressing over and over again. Very small fragments of different periods may entirely change the interpretation of an archaeological context.

Here a word about the use of collecting even 'knobbly bits'[77] is in place (Fig. 7). These are small rounded and partly eroded pieces of pottery and other ceramics defying classification as belonging to particular vessel types in many cases. Notably, most of them consist of Nile alluvium which is softer than the marl clay fabrics and while they are usually not assignable to any one group mentioned above their presence indicates post-depositional processes, which involve a lot of movement of ceramic material that is abraded and rounded as result of either human agency or natural causes. Observation of this phenomenon was particularly strong in sieved material, for example from tomb shafts. While their appearance and feel can be distinguished between pre- and post NK, exact dating cannot be achieved. Similar processes can be observed in ceramic sherds from drill cores and there it is important to note it for the processes of sedimentation of layers.

4 Strategies of tackling large amounts of pottery

In the process of sorting the material into fabric types and shapes it will quickly become clear if there are possibilities (or not) for reconstruction of larger pieces, which are more useful for typological analysis. Again the strategy will depend on how much is already known of a given site and on the resources available.

One of the crucial points in pottery processing is the knowledge of the composition of the context (or equivalent unit) before any reduction of material can be undertaken. It is essential to know the proportion of diagnostics and non-diagnostics and their characteristics, especially if any material is discarded afterwards. Generally,

76 E.g. Bader 2010: Fig. 8–9.

77 This term has been coined by Janine Bourriau.

Fig. 7: A heap of knobbly bits (© Courtesy of KU Leuven Dayr el-Barsha Project, photo: B. Bader).

the various fabrics occurring, the discernible shapes, diameters and quantity in various forms should be noted and, importantly, what was discarded and at which point. The development of time saving recording forms specific for each site requires experience and experimentation but the usefulness of such forms is indisputable. The design of such forms can also be done with the idea of digitisation in mind.

One way to cope with huge quantities of finds may be by means of random sampling techniques.[78] This does not mean a 'shopping list' approach but that a certain percentage of the finds is chosen in a random way without preconceived bias, for example, by means of the selection of each 10th context depending on the overall number of contexts to be analysed.[79] The procedures are complex and they should not be influenced by purposiveness in order to provide an overview of what is the common element in the assemblage, in which way ever the assemblage is composed. For the unusual element, additional choices can be made driven by personal experiences[80] or specific research questions. These two

78 Bourriau 1991: 267; Bader 2009: 61–147; Bourriau 2010: 1–16.

79 Consultation of a statistician is necessary.

80 This method was used for the comparative study between Tell el-Dabʿa and Kom Rabi'a in the Second Intermediate Period. One of the points that the existing research design did not cater for was the distribution of finger pinched ring bases. The random sampling technique concentrated on rims because they are more diagnostic for vessel typology than bases. The bases were exclusively chosen purposively and thus, it was not possible to prove the distribution because the bases were not taken systematically.

constituents of a context need to be marked clearly so that they will not be mixed and they can be analysed separately by means of strictly statistical methods. No information is lost. The advantage is the statistical validity of the material in the random sample, but the speed of the analysis is probably not much enhanced.

5 Drill cores

The ceramic material out of drill cores warrants a small paragraph on its own, due to the increasing amount of such work being done.[81] Again it depends on the questions asked from the material. While the description of the process of coring, the processing of the materials from the core and the analysis of the ceramic material goes beyond the scope of this paper, the engagement with extremely small fragments sieved with 4 mm mesh size is certainly a challenge but allows insights into the archaeology of sites in a depth usually well below accessible levels. The Theban Harbour and Waterways Survey project[82] not only looks at any dating possibilities for the layers within the cores but also at the processes that led to the formation of the layers and in this view it is very interesting to observe whether the material is very rounded, eroded or angular. Also the number of the fragments allows insights in the profile of the activities. Admittedly that is only valid for the tiny spot of where the core is set but that is 100 % more information than we had before, although the evidence is not easy to interpret. Best results can, of course, be achieved by coring in combination with excavation from which a valid stratigraphy can be used as immediate reference.[83]

Fig. 8: Fragment of a trimmed base sherd (© Courtesy of KU Leuven Dayr el-Barsha Project, photo: B. Bader).

The same but slightly different is done at Deir el-Bersha, where only larger material, i.e. sherds, is collected. The focus there is not so much on formation processes of the waterscapes as at Luxor but where the settlement areas were and the periods of activity. Of course, that cannot be too precise but sequences of several metres add significant evidence to the overall picture and some pottery is very distinctive even in small fragments. For example sherds of the base of a Middle Kingdom dish (Fig. 8) and a hemispherical cup cannot be mistaken for other pottery vessel types, if the ceramicist handled such material in the past.

6 Conclusions and appeal

The initial aim of the workshop in Mainz was to answer the following questions: (a) How do you deal with largely disturbed contexts? (b) How do you manage a huge quantity of finds? (c) How

81 Toonen/Graham et al. 2017 with bibliography.

82 Graham/Strutt et al. 2012; Graham/Strutt et al. 2015.

83 Toonen/Graham et al. 2017: 277.

do you identify specific items among mixed groups? (d) Which deeper insights do you gain by analysing difficult objects and contexts? (e) Which methods proved useful to you and which not at all? (f) How did you cope with inconclusive results? While questions (a) to (e) have been answered in the above text, I would like to sum up the contribution of data derived from pottery even from disturbed contexts for an enhanced interpretation of any given site : (a) general dating of activities at the site; (b) nature of activities at the site; (c) aspects of function of the site; (d) distribution/presence of certain raw materials and vessel types; and (e) history of technology.

The question of inconclusive results did not yet appear in my research as the data collection undertaken so far resulted in multiple lines of interpretation, which so far was not conceived as contradictory.

In an adaptation of a previous diagram[84] the information without the archaeological context is not so much worse (Fig. 9).

As a closing remark I would like to stress that project ceramicists **must** see everything that is contained in a context in order to date it correctly. There could be a tiny body sherd of a different date, which would change the interpretation of the context as a whole completely. If this information is missing or has been removed inadvertently, the final dating and interpretation of any given context is incomplete and perhaps totally wrong. Therefore any pre-sorting and discarding of pottery from any context compromises the result of the analysis before it even started. Nevertheless, the bulk of the context can likely be reduced by controlled, recorded and supervised discarding some of the material *without losing any information* and keeping the crucial elements of it – be they broken or not. This is something that needs to be stressed – even broken and 'non-diagnostic' material holds information that we cannot afford to throw on the dump heap.

For this reason archaeologists and ceramicists need to record clearly which and how much of the ceramic material was discarded, for the benefit of future students of the material.

How to deal with the ceramic material after its data and information was collected is also dependent on factors that are rarely in our own hands. While we can suggest strategies to reduce the bulk, although of course it would be much better and ethically correct to keep everything as the excavator is ethically obliged to do everything possible to safeguard, record, study and publish the excavated finds of all kinds, the total discard of the pottery as currently seen more frequently in Egypt is a huge step backwards to the bad old times. Nothing less than the credibility and scientific rigour of Egyptian archaeology is at stake, which will irretrievably be lost if there is no way to go back to ceramic material in order to reproduce and reassess previous results. Moreover, the chance to conduct new types of analysis will then also not exist.

84 Bader 2013: Fig. 1.

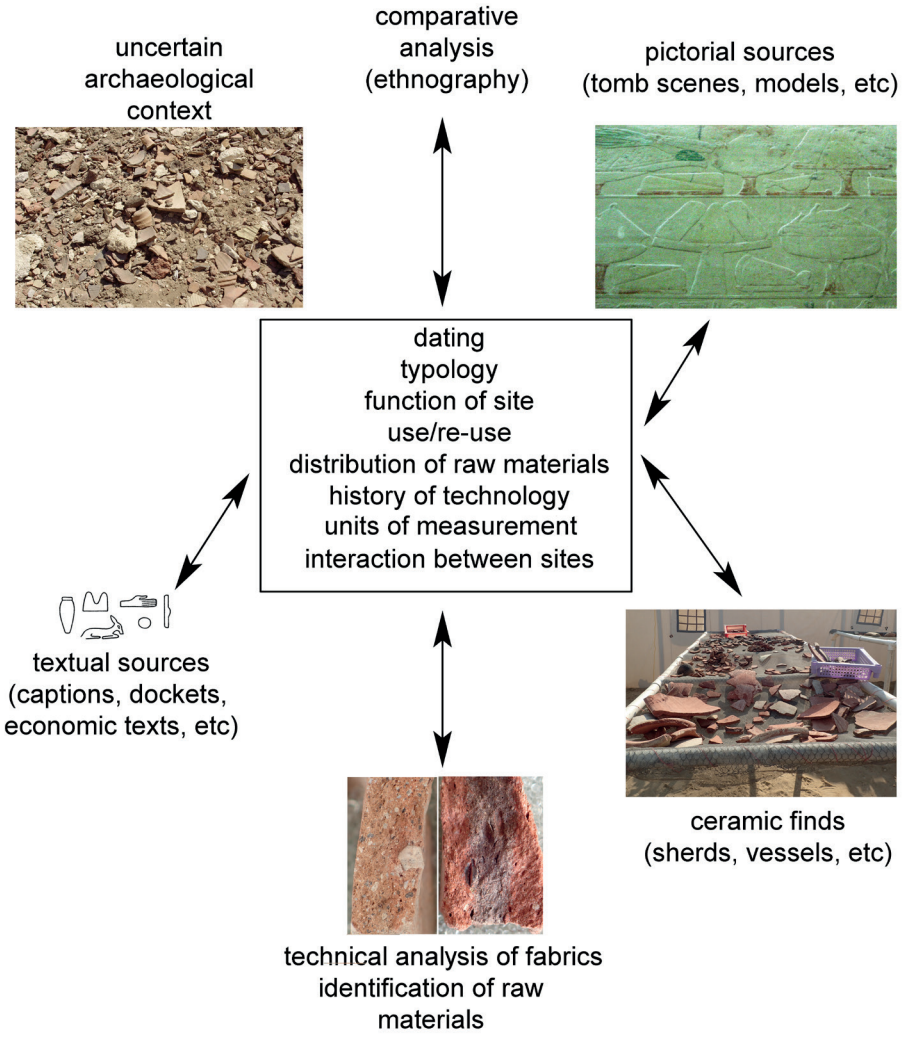

Fig. 9: Diagram of types of information to be gained from pottery and other sources (adapted from Bader *2013: Fig. 1).*

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Egyptian Archaeology in Need of a Data Turn

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The paper offers a proposal of elementary data formatting for publication, as the various existing approaches may gravely impede any larger syntheses of published data on the level of regions and countries. The key lies in the structuring of the published data, in intentional presentation of data in tabular form whenever possible. These tables ought to parse the data into the smallest possible units, securing a potential for machine-readable processing. The possibilities and limits of suchapproach are herein demonstrated on a particular and specific group of objects, Old Kingdom copper model tools, using the statistical software R.

1 Introduction

The global output of (only) all scientific research articles was estimated to reach 50 million in 2009.[1] Egyptology may be a small discipline in this spectrum of research, yet I hope I am not the only one feeling despair at the number of books and journals in the shelves containing new additions to the library. One cannot read them all, and one never really tries. The computer age offers faster methods of producing texts and forms of instant communication across the globe, but we read at the same pace as before. In our field, the Online Egyptological Bibliography offers now, in June 2020, 149,000 separate records online, adding new ones almost every day, with an estimated 6,000 additions each year.[2] How can we become truly interdisciplinary if the discipline itself has grown vast?[3]

Shall we capitulate? Each one of us is the master of their own specialist fiefdom – that is absolutely all right. Yet somebody sitting next to us might be achieving major breakthroughs e.g. in Egyptian philology, and we can barely notice and hardly appreciate. Is it possible, under such circumstances, to produce a larger synthesis of data?

It is impossible to cover every aspect of the problem; instead of a grand theory, I am offering a proposal of a single fundamental idea. In this paper, I would like to focus solely on the material culture and the form of presentation of data about it. After all, do we even have an idea of how much material, published or unpublished, there is? Taking architecture as an example, we know that there are c. 500 decorated Old Kingdom tombs preserved,[4] but how many undecorated tombs of the same period are there?[5] Porter, Moss, Burney and Málek gathered all inscribed mate-

1 Jinha 2010.

2 oeb.griffith.ox.ac.uk, accessed 29.06.2020.

3 Some of the problems mentioned herein were discussed also by Cruz-Uribe et al. 2013.

4 Linacre College 2007.

5 Old material that is often re-studied and re-dated, e.g. in the case of Meidum, a seemingly one-phase cemetery,

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rial,[6] but what with those thousands of unlucky artefacts bearing no inscription? The current estimate is that there are more than 2 million ancient Egyptian objects in over 850 museums in 69 countries.[7]

I would like to propose an initial step for a "data turn" in Egyptian archaeology. The key lies in the structuring of newly published data, in intentional presentation of data in tabular form whenever possible. Of course, this is often the case, but these tables ought to parse the data into the smallest possible units, securing a potential for machine-readable processing. The possibilities and limits of such an approach are herein demonstrated on a particular and specific group of objects, Old Kingdom copper model tools. Experience obtained on them can be, hopefully, applied also to other types of preserved archaeological evidence.

2 Archaeology and Egyptian archaeology – syntheses and material culture

As regards archaeology, an observation from 2006 is still valid: "... archaeological research remains a mosaic of parochial efforts. ... Research on large geographical areas is particularly difficult at present."[8] If you want to work with a large dataset, the quickest way (measured in years) is to create your own from scratch based on the published literature. While this is the best way, the collection and formatting of the data takes precious time that could be better spent analysing and thinking.

Computers have made it possible to produce longer texts more quickly. However, if we count (Egyptian) archaeology among the humanities, one of the greatest impediments of research is that the researchers often treat computers as typewriters – smarter, less loud and with less effort needed to press the keys, but still essentially as machines destined to produce texts accompanied with textual catalogues of data and illustrated by a "company of images".[9] Even though the digital humanities exist, they tend to be perceived as another "fancy" collocation in our vocabulary rather than as a completely new approach to doing research.[10] In order to achieve this, however, one must perceive the fundamental difference between digitized/digitizable information and mere printed textual information or searchable PDF.

(Egyptian) archaeology is in a phase similar to where classical philology was a hundred years ago. Quoting an early article mentioning computerized texts: "*searching for clusters of words, for metrical patterns and stylistic patterns, and similar philological procedures, can now be done in minutes and hours – where the nineteenth-century scholar spent years of toil*".[11] Texts are, however, easier to be processed by digitization than three-dimensional objects of material culture – and archaeologists are used to the toil, as there is hardly any other option now, especially for intra-site and supra-regional analyses. Forced to remember innumerable entries of the published data, an Egyptian archaeologist spends time that could be devoted to analyses in search for analo-

turned out to be much more complex: Rzeuska 2011; Warden 2015.

6 http://topbib.griffith.ox.ac.uk//index.html, accessed 2.11.2019.

7 http://www.globalegyptianmuseum.org/, accessed 29.11. 2019.

8 Snow et al. 2006.

9 Miniaci et al. 2017.

10 For an overview cf. Wendrich 2018 and for the Egyptology on the Internet, see Claes/Van Keer 2014; Odler 2018.

11 Thomas 1990: 72. For a more recent summary, see e.g. Revellio 2015.

gies. An excellent archaeologist either becomes a specialist in the myriads of monographs, articles and reports and the ways they present the data or a less excellent archaeologist resigns and quotes only parallels from major, most important sites. A synthesis is possible, but only after a lifetime of reading and making excerpts from catalogues.

Numerous monographs on material culture have been published in Egyptian archaeology. Even if we stick to the realm of the copper alloy artefacts (the subject of the following case study), the outputs are manifold.[12] However, any attempt to collect, compare and analyse published or unpublished data means a lot of precious time spent in an effort to accommodate the data to the desired structure, not mentioning the difficulties of accessing the material or travelling to it, if access is allowed at all.

3 A proposal for data analysis

The potential of data structuring and subsequent analysis goes deeper and further. Instead of just looking for parallels in other excavation reports, we could properly analyse statistical data and discover the structures that are "hidden" behind the objects. A solution for material culture studies can lie in a structured and machine-readable presentation of selected data. The data points ought to be parsed into the smallest possible units, thus enabling faster work with them later.

Here I would like to turn away from a detailed presentation of advanced statistical methods.[13] In fact, we can gain fundamental information from data even by using descriptive statistics, which is available in each and every personal computer. Statistical "heavy machinery" of exploratory statistics is often not necessary, although it will be inevitable for the solution of complex problems.

Apart from software present among the applications of any personal computer, often proprietary, the statistical software R can be proposed as another important solution. "*R is a free software environment for statistical computing and graphics. It compiles and runs on a wide variety of UNIX platforms, Windows and MacOS.*"[14] It is a free open-source tool widely used by professionals in the fields of data science, statistics, and many other scientific disciplines. Moreover, you can start using the R software immediately, without any barriers except for the R learning curve. Many textbooks and guides on R exist, freely downloadable on the Internet. Fortunately, archaeology also has its introduction to R, written by Michael Baxter and Hillary Cool, with a PDF version available for free online.[15] In understandable style and clear language, the authors propose many possibilities of data analysis and statistical graphics beyond the ubiquitous and often unnecessary "pie charts". Herein, I would like to apply some of the methods to a selected structured dataset.

4 Case study and proposal of data structuring

An example of the data structuring and simple analysis is provided again in a form of a case study. It is focused on Old Kingdom copper model tools, miniaturized blades of full-size functional tools that were deposited in the bu-

12 Kühnert-Eggebrecht 1969; Lilyquist 1979; Radwan 1983; Davies 1987; Philip 2006; Petschel 2011; Odler 2016, etc.

13 For introduction to them, see e.g. Shennan 1997; Baxter 2003; Baxter 2015.

14 https://www.r-project.org/, accessed on 1.11.2019.

15 Baxter/Cool 2016. See also Carlson 2017.

rial equipment of the Old Kingdom social elite.[16] Several tool kits of the period included copper objects of various uses: artisan, cosmetic, textile and leatherworking, hunting and food processing, weaponry. Standard burial equipment often contained only four classes: chisels, adzes, axes and saws – tools from the artisan tool kit that were used for working wood and stone (Fig. 1). The tomb owner himself or herself – or the person buried in the burial chamber of another tomb owner – did not work with those tools during their lifetime. It was an expression of the owner's social status: this person was capable of ordering and funding craftwork for his or her needs, especially in the creation of the tombs and their functional cultic parts, such as false doors and other decoration.[17]

These model tools were often uninscribed and thus less interesting for publication in detail. In order to document unpublished material and check published objects, the author used a student grant to study them and create a database in the FileMaker software. Four main parameters were recorded for each object or fragment: length, width, thickness and weight, apart from other description entries listed in the monograph. Drawing and photograph documentation was also added, but more complex methods, such as 3D scanning or 3D modelling, were ruled out due to time constraints. Comparative knowledge of the material was gradually acquired, as a direct experience with the artefacts cannot be fully replaced by either the published information or an entry in an online museum database. Archaeology is also a "craft" that must be learned, and such informal knowledge of the material is often difficult to deliver in writing or lecturing; similarly, there are not many texts dealing with crafts written by ancient Egyptians.[18]

This exercise in documentation proceeded from several assumptions. Copper and metals in general are among the items of material culture that were controlled in the Old Kingdom, in the case of metal by weighing.[19] The weight of the objects has been documented, but the original weight of the objects themselves is not accessible due to the corrosion processes in many cases; moreover, smaller model tools may have completely lost their metal cores. Thus, other measurable properties, proxy descriptors, of the objects are observed. The measurements and weights are only proxy data, as we cannot access the objects in their original form, right after the moment of production, in their finished intended shape. Nevertheless, the data cannot be much different from the original size of the objects, if preserved complete.

Besides the measurements, another important descriptor is the completeness. In the stage of analysis, as presented here, only complete artefacts are analysed. In the Old Kingdom, model tools were complemented by small wooden hafts and handles, sometimes bound into bundles or packed in the textile, most probably imitating

16 For a detailed discussion, the reader is referred to the publication of the material in Odler 2016. Only issues relevant to data structuring and data analysis will be highlighted here.

17 For written evidence of contracts between the patrons and the artisans, see Wilson 1947; Müller-Wollermann 1985.

18 For an overview of what we know about ancient Egyptian craft and especially metalworking from ancient Egyptian sources, see e.g. Drenkhahn 1976; Scheel 1985; Scheel 1986; Scheel 1987; Drenkhahn 1995; Davey 2012. As an example of ancient Egyptian text on the craft, cf. Barta 1970; Stauder 2018. On the modern importance of craft and process of its learning, cf. Sennett 2009, although the book lacks substantial information from archaeology, e.g. in a chapter on clay.

19 Scheel 1985; Odler 2016: 29–30, Fig. 11.

Fig. 1: Old Kingdom copper model tools from Abusir South, from Shaft 2 of the tomb AS 29. Following main classes are present: a – chisel blades, b – adze blades, c – axe blades, d – saw blades (photo by Kamil Voděra, © Czech Institute of Egyptology, Faculty of Arts, Charles University, Prague).

real-life storage of the objects.[20] Nevertheless, only the blades were weighed and metal was the material depicted under supervision, not the wooden complements of the models.

5 Complete artisan tool kit blades: a comparison

In this case study, we focus on completely preserved artisan tool kits, meaning that at least a single specimen of each main class – the chisels, adzes, axes and saws – was preserved. Forty such archaeological contexts have survived from the Old Kingdom, defined as Dynasties 4 to 6 (c. 2600–2180 BC), and were documented (Table 1). Even if we limit ourselves to these contexts, the number of preserved specimens is 1,172, which can be considered as an example of ancient Egyptian "big data". The enthusiasm is, however, quickly cooled down by the number of complete specimens (although it is still well over 100 in the case of chisels and adzes) and a subsection of those that could be directly measured (altogether 235 artefacts, or 20 % of the assemblage).

This subset of data was plotted out in several scatter plots, displaying the length of the complete artefacts on the x-axis and the width on the y-axis. When we plot out the measured dimensions, the measurements are apparently different for each of the four classes of model tools. In cases of overlap, the class typology can successfully help in distinguishing between the object shapes (Fig. 2).

20 Odler 2016: 222–223.

Table 1: Tool counts in the Old Kingdom artisan tool kits preserved with all main four classes of tools.

Context (Odler 2016)	Site	Structure	Period
G39	Giza	G 8250	Old Kingdom, Dynasty 4, end
Ay1	Abydos	Tomb 918	Old Kingdom, Dynasty 6
G33	Giza	G 8260	Old Kingdom, Dynasty 4 to 5
Ba4	Bubastis	Tomb 161	Old Kingdom, Dynasty 6, the reign of Pepy II
G45	Giza	G 4360	Old Kingdom, Dynasty 4 to 5
EK2	el-Kab	Tomb of Kaimen	Old Kingdom, Dynasty 6, the beginning
G48	Giza	G 7143, Shaft B	Old Kingdom, Dynasty 5, beginning
A15	Abusir	Burial chamber of Kahotep	Old Kingdom, Dynasty 5, the reign of Nyuserra
G46	Giza	G 4631	Old Kingdom, Dynasty 5, the reign of Weserkaf
A28	Abusir	Tomb AC15	Old Kingdom, Dynasty 5, the reign of Djedkara
G53	Giza	Mastaba of the Shaft 559	Old Kingdom, Dynasty 5, middle
A40	Abusir	Tomb of Qar Jr.	Old Kingdom, Dynasty 6, the reign of Pepy II
G63	Giza	G 8656, Shaft 585	Old Kingdom, Dynasty 5, second half
A41	Abusir	Tomb of Qar Jr.	Old Kingdom, Dynasty 6, the reign of Pepy II
A37	Abusir	Tomb Lake of Abusir 5, Shaft 2	Old Kingdom, Dynasty 6, early
A44	Abusir	Tomb of Inti	Old Kingdom, Dynasty 6, the reign of Pepy II, first half
A31	Abusir	AS 68d, Tomb of Nefer	Old Kingdom, Dynasty 5, late
A46	Abusir	Tomb of Inti	Old Kingdom, Dynasty 6, the reign of Pepy II
G71	Giza	G 8853	Old Kingdom, Dynasty 5, late
A49	Abusir	Tomb of Inti, Burial chamber of Inti Pepyankh	Old Kingdom, Dynasty 6, the reign of Pepy II
G68	Giza	G 4520	Old Kingdom, Dynasty 5, late
G97	Giza	G 2381, Shaft A	Old Kingdom, Dynasty 6, the reign of Pepy II
G50	Giza	G 4920	Old Kingdom, Dynasty 5, end
S2	Saqqara	Tomb of Ptahshepses	Old Kingdom, Dynasty 5, end
G92	Giza	G 8640	Old Kingdom, Dynasty 6, first half
S4	Saqqara	Grave 240 in Mastaba of Kaemsenu	Old Kingdom, Dynasty 5
G88	Giza	Mastaba Lepsius 55	Old Kingdom, Dynasty 5 to 6
G105	Giza	Mastaba with Shafts 125/157	Old Kingdom, Dynasty 6
Gb1	Gebelein	"Large Tomb"	Old Kingdom, Dynasty 5 late or 6
	Sedment	Tomb 2106	Old Kingdom, Dynasty 5 late or 6, Stufe IB
G107	Giza	Mastaba S 309-316, Shaft 316	Old Kingdom, Dynasty 6
G109	Giza	Mastaba of Setka and Ptahhetep, Shaft 890A	Old Kingdom, Dynasty 6
S7	Saqqara	Tomb of Ankhmahor	Old Kingdom, Dynasty 6, early
S9	Saqqara	Tomb of Neferseshemra Shesi	Old Kingdom, Dynasty 6, the reign of Teti
S6	Saqqara	Tomb of Kagemni	Old Kingdom, Dynasty 6, the reign of Teti
S14	Saqqara	Tomb of Khentika	Old Kingdom, Dynasty 6, the reign of Pepy I
Ay14	Abydos	Tomb 747, A.09	Old Kingdom, late / First Intermediate period
Mr1	Meir	Tomb of Pepyankh the Middle	Old Kingdom, Dynasty 6, the reign of Pepy II
G124	Giza	Context IV	Old Kingdom general
G125	Giza	Context VIII	Old Kingdom general
Total			
Total			

Table 1 (continued): Tool counts in the Old Kingdom artisan tool kits preserved with all main four classes of tools.

Region	chisels complete	chisels incomplete	chisels fragment	chisels total	adzes complete	adzes incomplete	adzes fragment
Memphite region	7	1		8	6	2	
Abydos	27	11		38	9	10	
Memphite region	1			1	2		
Delta	4	1		5	1		
Memphite region	7			7		1	
between Thebes and el–Kab	6			6	2		
Memphite region			1	1		1	1
Memphite region	12	1		13	6		
Memphite region	4			4	1	1	
Memphite region	10	3		13	1	1	
Memphite region	19			19	14		
Memphite region	28	4	1	33	6	9	
Memphite region	22	5		27	12	4	4
Memphite region	9			9	6	5	
Memphite region	17	6	6	29	17		2
Memphite region	4	8	29	41		3	20
Memphite region	11		14	25	1	12	5
Memphite region	7	1	19	27	1	2	2
Memphite region	9			9	1		2
Memphite region	35	5	3	43	20		
Memphite region	2			2	2		
Memphite region	11	5	5	21	3	3	1
Memphite region		2	3	5	3	1	1
Memphite region	11	4	1	16	2		
Memphite region	28	2		30	7	3	6
Memphite region	3			3	1		
Memphite region	16	4	1	21			1
Memphite region	5	4		9			2
between Thebes and el-Kab	3			3	3		
between Fayum and Beni Hasan	5			5	2		
Memphite region	8		2	10	1	1	
Memphite region	5		1	6	2	1	1
Memphite region		1		1	1		
Memphite region	3			3	3		
Memphite region	4			4	4		
Memphite region	2			2	2		
Abydos	3			3	10		
Between Amarna and Asiut	14			14	8		
Memphite region	8	1	3	12	6	6	
Memphite region	2	5		7		4	
	372	**74**	**89**	**535**	**166**	**70**	**48**
				535			

Table 1 (continued): Tool counts in the Old Kingdom artisan tool kits preserved with all main four classes of tools.

adzes total	axes complete	axes incomplete	axes fragment	axes total	saws complete	saws incomplete	saws fragment	saws total	Total
8	1	1		2	1	3		4	
19	9			9	5	4	1	10	
2	2			2	1			1	
1		2		2		1		1	
1	1			1		1		1	
2	1			1	1			1	
2		1		1			1	1	
6	3			3	7			7	
2	3			3		2		2	
2		1		1		2		2	
14	6	6		12	5	2		7	
15	15	6	1	22	1	2		3	
20	4	7		11		4	8	12	
11	2			2	2	2		4	
19	9			9			5	5	
23	1		2	3			2	2	
18	1	2		3	1	3	1	5	
5	1	1	3	5			1	1	
3	1			1			2	2	
20	2		15	17	15			15	
2	1			1	1			1	
7		10		10	2	6	6	14	
5		1		1		1	1	2	
2	4	2		6			1	1	
16	1	11		12	2	4	4	10	
1	1			1	1	1		2	
1		1		1		3	1	4	
2			1	1		8	1	9	
3	2			2	1			1	
2	3			3	1			1	
2	2			2		2	1	3	
4			1	1		1		1	
1	1			1		1		1	
3	4			4	1			1	
4	1			1		1		1	
2	1			1	2			2	
10	10			10	4			4	
8	5			5	7			7	
12		4	1	5		6	7	13	
4		2		2	1	6	2	9	
284	**98**	**58**	**24**	**180**	**62**	**66**	**45**	**173**	
284				**180**				**173**	**1172**

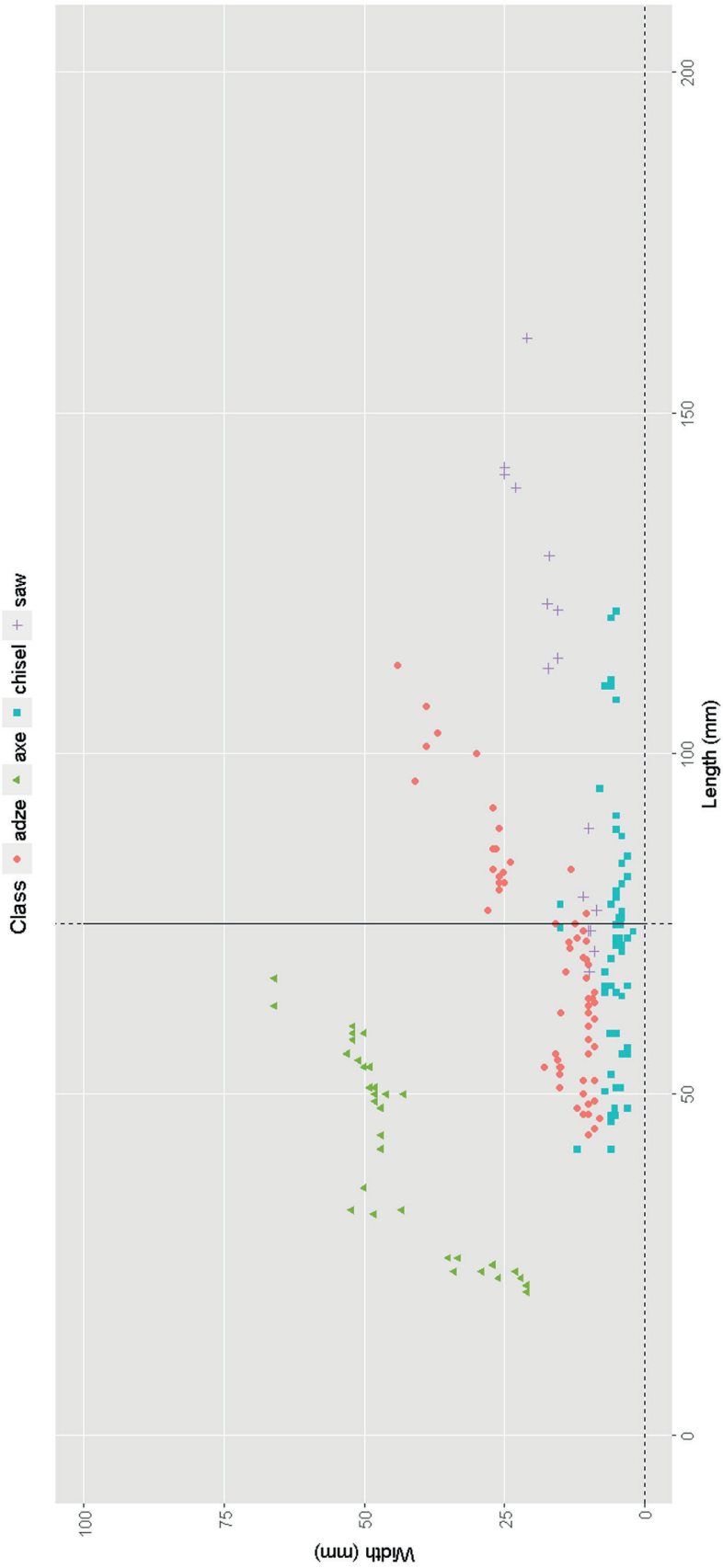

Fig. 2: Scatter plot of the lengths and widths of copper model tools from completely preserved Old Kingdom model tool kits, divided on the basis of the main tool classes. Solid line denotes 75 mm.

The categorization of the data can reveal several important aspects of the subset. Most of the data come from the Memphite necropoleis, especially from Giza and Abusir (Fig. 3). Then, if we compare the dating of the assemblages, most of the complete models of exceptional size are from late Dynasty 6, from the reign of Pepy II (Fig. 4). A closer study leads to an assumption that most of these were under the length of 75 mm, i.e. the ancient unit of one Egyptian palm, one-seventh of an ancient Egyptian cubit (the length of c. 52.5 cm).

Instead of dealing with all classes, let us focus on a measured sample of Old Kingdom adze blades.[21] In absolute numbers, 59 artefacts are longer than 75 mm and 77 specimens are shorter. Statistical graphics offers an advantage, as it demonstrates not only the counts but most importantly the structure of the data. A specific type of boxplots, so-called violin plots, helps to establish that the bulk of the adze blades is concentrated below the level of 75 mm, but not in the case of each variant (Fig. 5).[22] This is also confirmed by a specific type of histogram, the kernel density estimate, which once again demonstrates a concentration of the lengths below the given level (Fig. 6).

6 Discussion of the results

A check of the contexts of longer, exceptional blades, reveals that they most often belonged to high-ranking Old Kingdom officials, their families or members of the royal family (Table 2). On the other hand, many important personages are missing from the table, either having blades shorter than expected or not having measured blades at all. It is important to note that other variables might have also expressed status, including a different alloy (many model tools have not yet been analysed, however) or the gilding of a copper artefact. Such contextual information can also be delivered in tabular form, but it was not examined and published for all contexts. Size could have mattered, but it was most probably not the only variable.

This confirms on the level of funerary material culture an observation Janet Richards made in her study *Society and Death in Ancient Egypt: Mortuary Landscapes of the Middle Kingdom*: "*… (Middle Kingdom) Egyptians may have invested in grave wealth as an alternative to grave size in materializing status*".[23] Such "fuzzy rule" can be applied also to the Old Kingdom and its funerary culture, even within a focus restricted solely to copper artefacts. Bigger does not always mean better; a broader context and socio-cultural setting of the data is important, together with tabular representation of the data.[24]

Old Kingdom written and iconographic sources offer an interpretation of the occurrence of larger model tools, although only by the use of analogy, as they did not inform particularly about the issuance of copper model tools. Larger models could have been issued from the Treasury as a "gift" from the king or the royal administration.[25]

21 On Early Dynastic and Old Kingdom adzes, see Odler 2015. Adze blades have also been analysed using complex methods: Odler/Dupej 2016; therefore, they can be instructive also within descriptive statistics.

22 For the discussion of specific variants and their chronological and chorological meaning, see Odler 2016: 140–142.

23 Richards 2005: 175.

24 I have dealt with these issues in detail in this article: Odler in press.

25 Discussed in Odler 2016: 233–235. Old Kingdom evidence of objects issued from Treasury is listed in Desplancques 2006: 200–206.

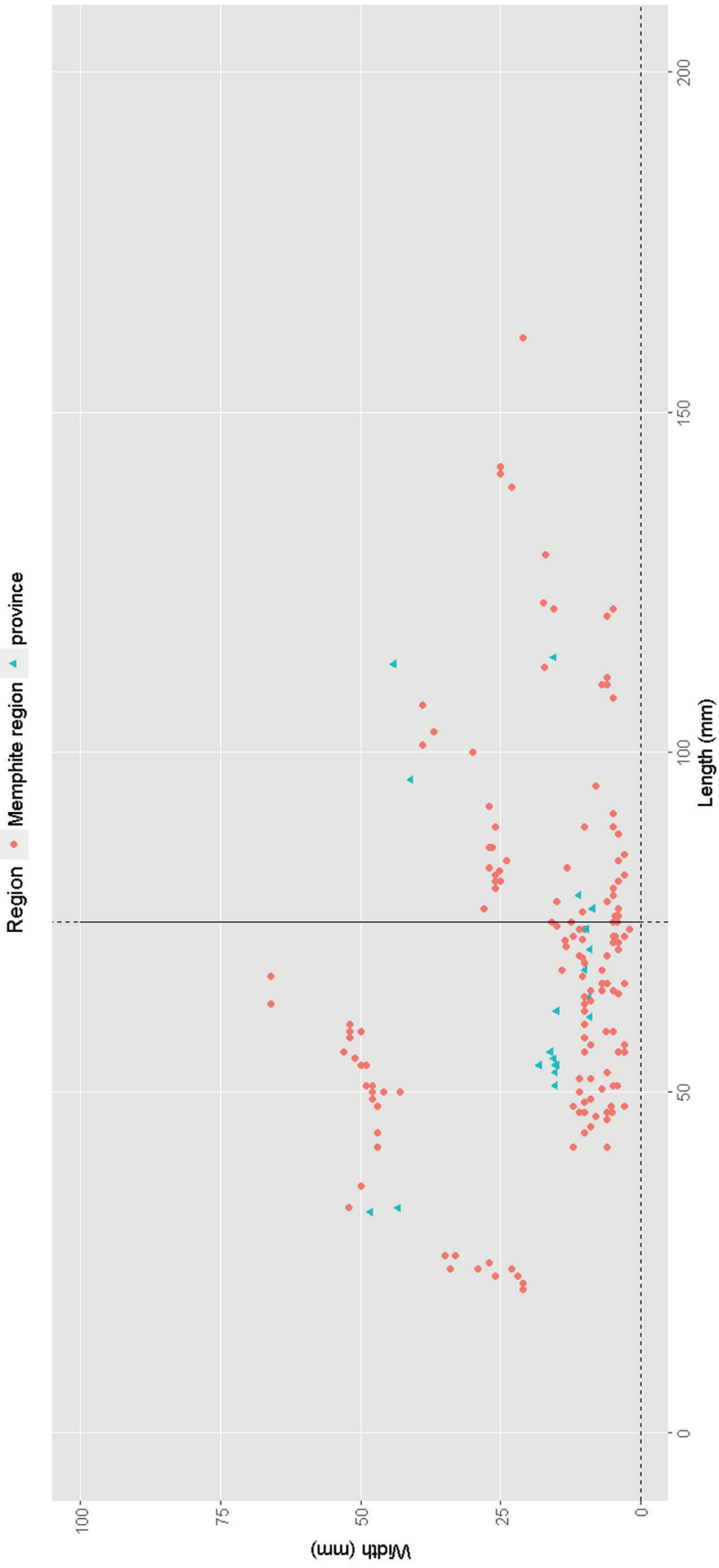

Fig. 3: Scatter plot of the lengths and widths of copper model tools from completely preserved Old Kingdom model tool kits, divided on the basis of the provenance of tool kits. Solid line denotes 75 mm.

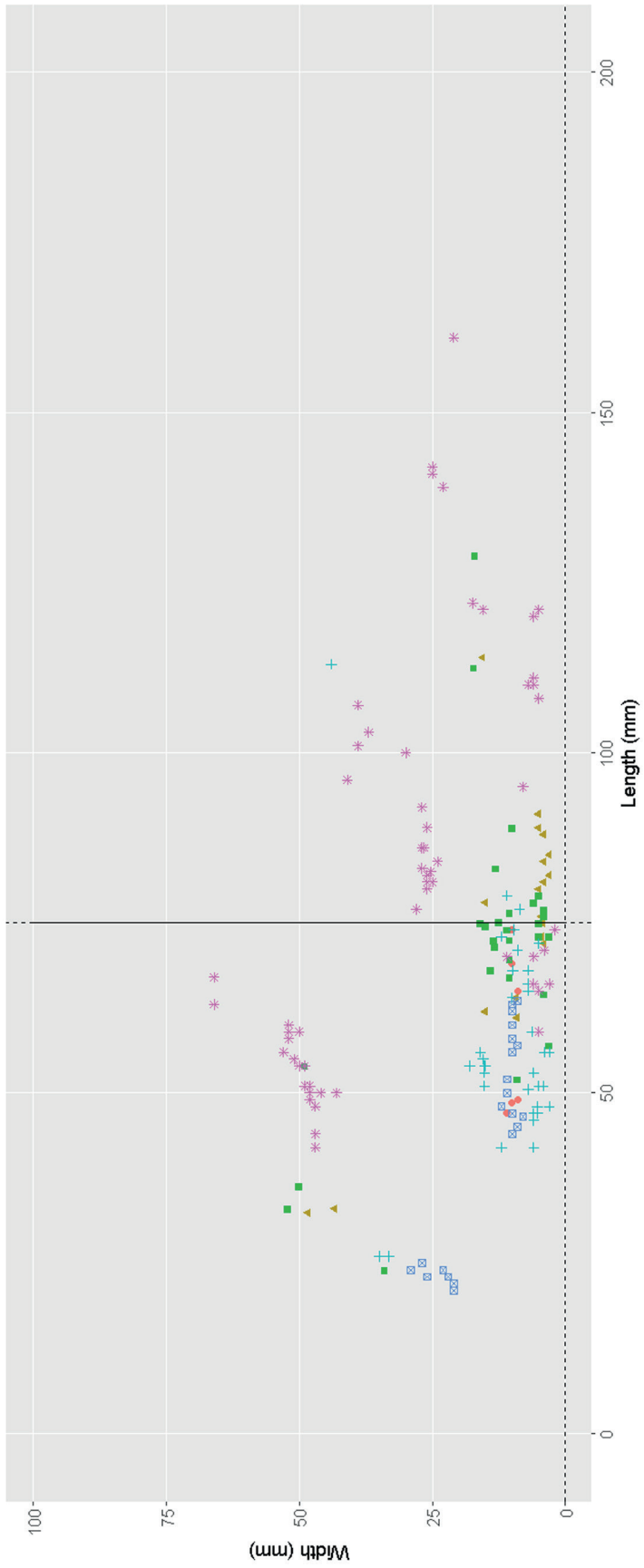

Fig. 4: Scatter plot of the lengths and widths of copper model tools from completely preserved Old Kingdom model tool kits, divided on the basis of the dating of corpora. Solid line denotes 75 mm.

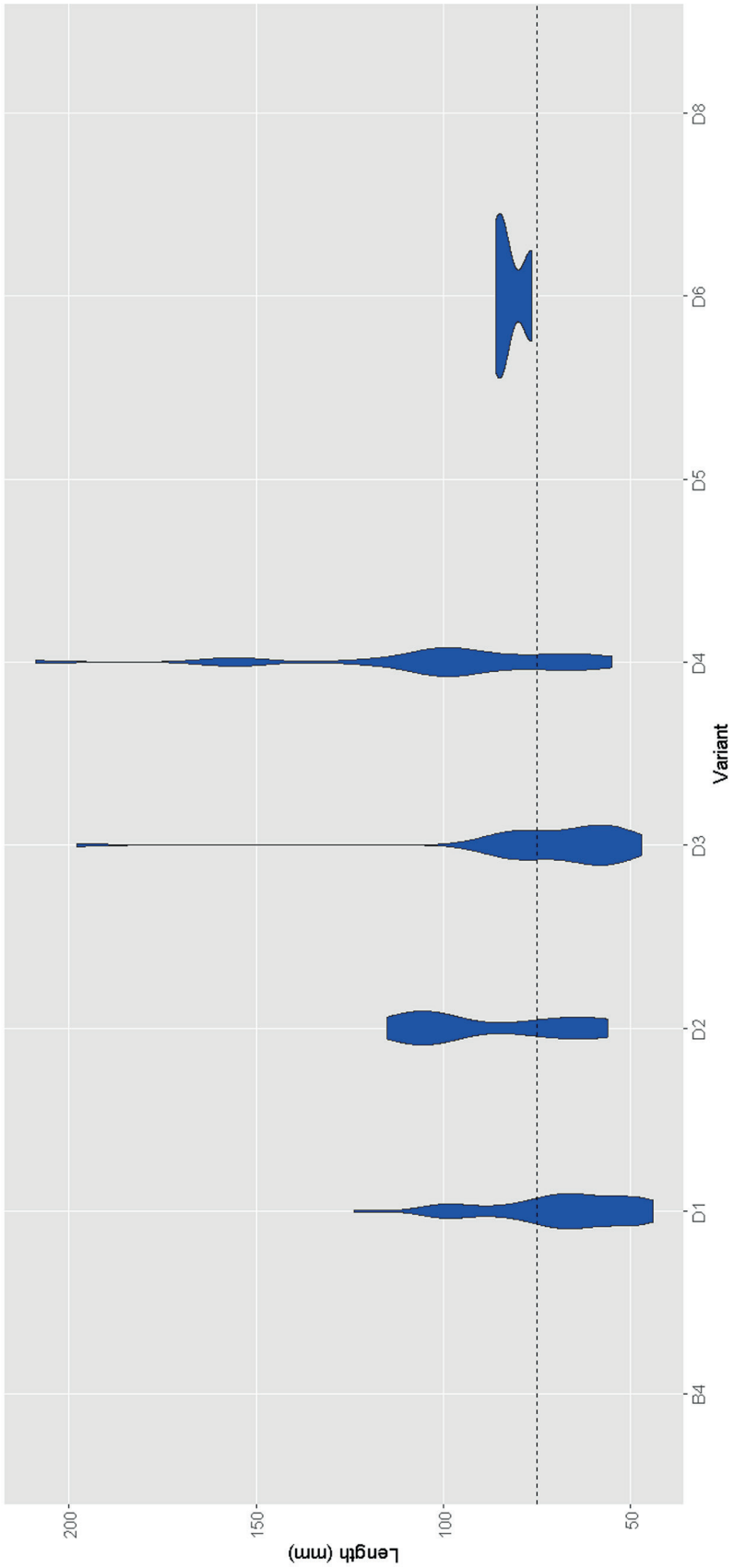

Fig. 5: Violin plots of the lengths of complete Old Kingdom adze blades, divided on the basis of adze variants. Dashed line denotes 75 mm.

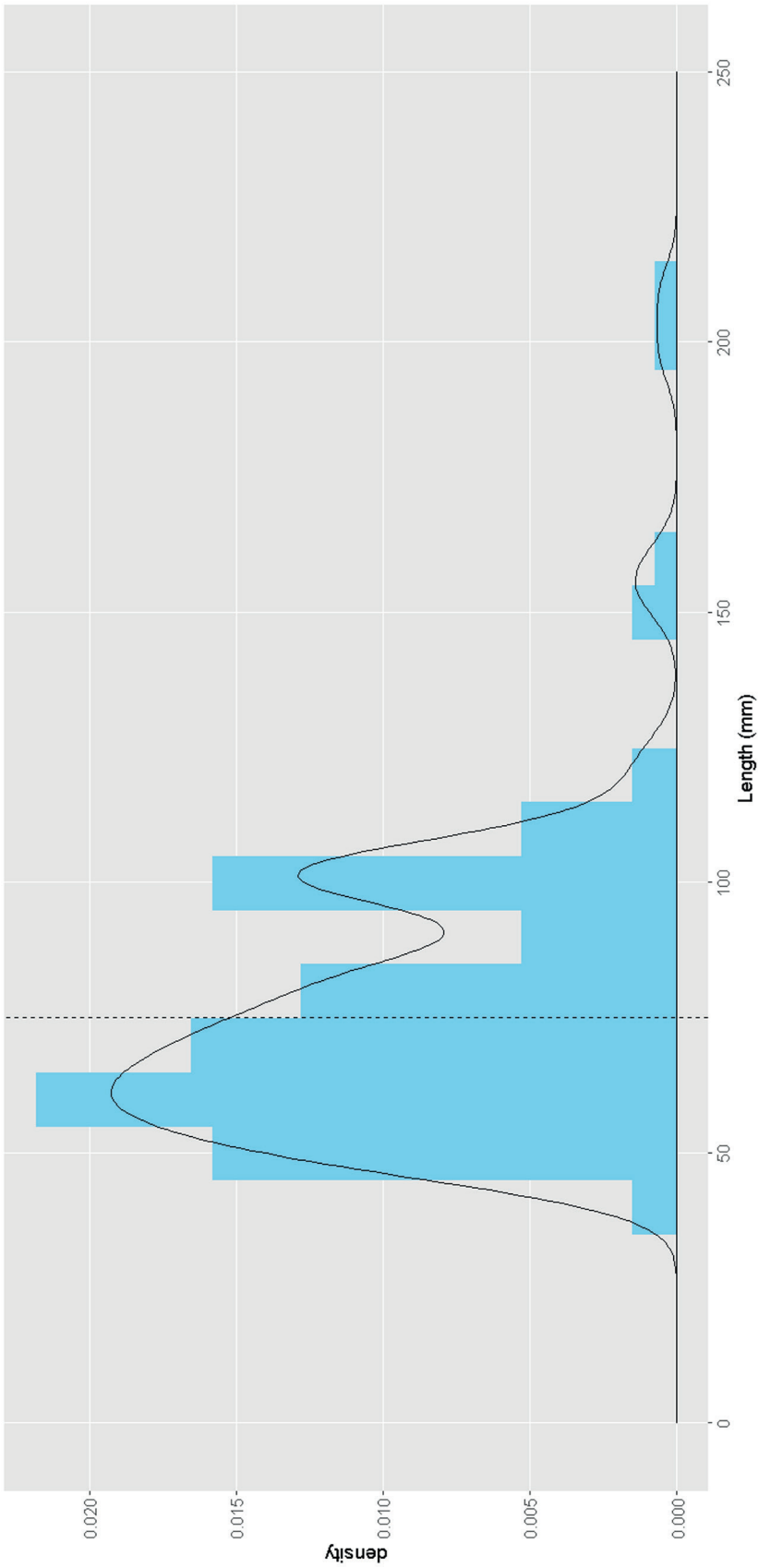

Fig. 6: Kernel density estimate of the lengths of complete Old Kingdom adze blades. Dashed line denotes 75 mm.

Table 2: Old Kingdom model tool assemblages with blades longer than 75 mm.

Site	Structure	Owner	Tools	Period	Social status
Abusir	Tomb of Princesses Khaemerernebty and Meretites, and Kahotep	*Kɜ(=j)-ḥtp*	adzes, saws	Old Kingdom, Dynasty 5, the reign of Nyuserra	sole companion
Abusir	Tomb AC15	*Ḫkr.t-Nb.ty*	chisel	Old Kingdom, Dynasty 5, the reign of Djedkara	princess
Giza	Context IV	unknown	saw	Old Kingdom, Dynasty 5 to 6	unknown
Giza	Mastaba Lepsius 55	*Ny-ꜥnḫ-Rꜥ(.w)*	chisels	Old Kingdom, Dynasty 5 to 6	inspector of physicians of the Great House
Abusir	AS 68d, Tomb of Nefer	*Nfr-Ḥwt-Ḥr.w*	saw	Old Kingdom, Dynasty 5, late	spouse of a middle-ranking official
Giza	G 4520	*Ḫw(j)=f-wj-ꜥnḫ*	chisel	Old Kingdom, Dynasty 5, late	singer and khentyesh
Giza	G 4920	*Ṯn.tj*	adzes, chisels	Old Kingdom, Dynasty 5, end	sole companion, controller of the palace
Abydos	Tomb 918	unknown	adzes, saws	Old Kingdom, Dynasty 6	unknown
Abusir	Tomb of Inti	*Jn-tj*	adzes, chisels	Old Kingdom, Dynasty 6, the reign of Pepy II, first half	judge
Abusir	Tomb of Inti, Burial chamber of Inti Pepyankh	*Jn-tj ꜥnḫ-Pp.y*	adzes, chisels	Old Kingdom, Dynasty 6, the reign of Pepy II	scribe of the royal documents in the king's presence
Abusir	Tomb of Qar Jr.	*Ḳꜥr*	adzes, chisels, saws	Old Kingdom, Dynasty 6, the reign of Pepy II	judge
Bubastis	Tomb 161	*Mr(j)-Mr-n-Rꜥ.w*	adzes, chisels	Old Kingdom, Dynasty 6, the reign of Pepy II	sole companion
Giza	G 2381, Shaft A	*Mr(.y)–Ptḥ–ꜥnḫ Mr(.y)–Rꜥ.w Špss-Ptḥ Jmp.y*	adzes, chisels, saws	Old Kingdom, Dynasty 6, the reign of Pepy II	vizier
Meir	Tomb of Pepyankh the Middle	*Ḥw.t–jꜥḥ*	chisels	Old Kingdom, Dynasty 6, the reign of Pepy II	spouse of a nomarch

Table 3: Examples of the data presentation.

A	Category	Class	Type	Variant	Completeness	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)
	model blade	adze	D	D1	incomplete	97	18	2	8.9

B	Category	Class	Type	Variant	Completeness	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)
	model blade	adze	D	D1	incomplete	97	18 + x	2	8.9

C	Category and class	Variant	Completeness	Dimensions	Weight
	model adze blade	D1	incomplete	97 × 18 + x × 2 mm	8.9 g

An inscription is not needed if the "high-status" connotation is understood by the society or if the inscriptions were present on other objects coming from the king. Singer Khufuankh's false door was a gift from the king, as an inscription on it states clearly.[26] Did this royal favour extend to the burial equipment, as among the model tools was also a single specimen longer than 75 mm?

7 Structured data

If you open any publication of "material" from ancient Egypt, many pages are devoted to its catalogue presentation. However, analytical work is only possible after investing considerable effort in transcribing the data into a structure, nowadays preferably machine-readable. A data structuring proposal is offered in Table 3. Sample A divides all information and is the preferred template used in this study. Sample B adds more complex information about the completeness of the data, but it may complicate machine processing. Sample C is the least user-friendly, merging many data points into one field. Sample A can be processed using an OCR software, although after the publication of a corpus, there is no reason not to offer the data in an openly accessible form, as a structured computer file.

What I have tried to argue in this article is that at least part of the data should be parsed into the simplest possible units. Such units are machine readable and can be easily imported and worked upon. On the other hand, detailed descriptive catalogue presentations can impede its processing.

This contribution presents a fundamental approach to data structuring applicable virtually on any computer, even on simpler ones. I have tried a similar approach in the presentation of data on Old Kingdom copper vessels found in the burial equipment of Inti Pepyankh from Abusir South (Table 4).[27] Another practical example of a formatting of archaeological data is represented by our recent archaeological report on the excavations of the tomb AS 104 at Abusir South, where this approach was used for presentation of the metric data on offering basins and shafts.[28] A similar approach was applied also in author's PhD thesis, completed and submitted in March 2020.[29] As a commendable example on wider scale outside of our field, we can mention a recent monograph on a category of Bronze Age Scandinavian objects with fundamental measurements of the objects presented in a table rather than in a catalogue.[30]

8 Complex approaches to analyses

Naturally, more complex analytic methods are also available. In the monograph mentioned above, case study was devoted to a morphometric analysis of the Old Kingdom adze blades, based on geometrical morphometry and principal component analysis and providing results similar to our basic approach. We have applied geometrical morphometry to represent the shapes of 199 complete Old Kingdom adze blade outlines; a peculiarity of information processing by the software Morphome 3CS enabled also the analysis of adzes not included in the plots presented above.[31]

26 Museum of Fine Arts, Boston, accession number 21.3081, https://collections.mfa.org/objects/144615/false-door-of-khufuankh, last accessed 29.11.2019.

27 Published as Table 1 in Odler 2017.

28 Odler/Peterková Hlouchová et al. 2019, Tables 1, 2.

29 Odler 2020.

30 The monograph is available in open access, the referred table is Table 1 in Nørgard 2018.

31 Odler/Dupej 2016.

Table 4: An example of the data publication, parsed into separate data units (published in Odler 2017: Table 1).

Find no.	Owner	Category	Type	Completeness	Diameter (mm)	Height (mm)	Base diameter (mm)
101/AS22/2000_rr	Inti	miniature vessel	bowl with flat base and concave sides	complete	70	13	22
108/AS22/2000_y	Inti	miniature vessel	convex bowl	fragment			
127/AS22/2002_a	Inti Pepyankh	miniature vessel	nemset vessel	complete	48	171	83
127/AS22/2002_a	Inti Pepyankh	full-size vessel	lid of nemset vessel	complete	80	67	40
127/AS22/2002_b	Inti Pepyankh	full-size vessel	spouted jar	incomplete	68		
127/AS22/2002_b	Inti Pepyankh	full-size vessel	wash basin	incomplete	280	146	138
127/AS22/2002_c	Inti Pepyankh	full-size vessel	spouted jar	complete	66	225	112
127/AS22/2002_c	Inti Pepyankh	full-size vessel	wash basin	complete	330	165	177
127/AS22/2002_d	Inti Pepyankh	full-size vessel	hes vase	complete	72	278	53
128/AS22/2002_d	Inti Pepyankh	miniature vessel	bowl with flat base and inclining sides	complete	59	25	32
128/AS22/2002_e	Inti Pepyankh	miniature vessel	bowl with flat base and inclining sides	complete	52	22	29
128/AS22/2002_f	Inti Pepyankh	miniature vessel	hes vase	incomplete	28	92	24
128/AS22/2002_g	Inti Pepyankh	miniature vessel	hes vase	complete	30	94	26
128/AS22/2002_h	Inti Pepyankh	miniature vessel	cup with pointed base and flaring rim, S-shaped section	complete	36	65	
128/AS22/2002_i	Inti Pepyankh	miniature vessel	bowl with flat base and inclining sides	complete	58	27	33
128/AS22/2002_j	Inti Pepyankh	miniature vessel	bowl with flat base and inclining sides	complete	59	25	32
128/AS22/2002_k	Inti Pepyankh	miniature vessel	bowl with flat base and inclining sides	complete	51	20	30
128/AS22/2002_l	Inti Pepyankh	miniature vessel	bowl with flat base and inclining sides	complete	50	22	29
128/AS22/2002_m	Inti Pepyankh	miniature vessel	bowl with flat base and inclining sides	complete	52	22	32
128/AS22/2002_n	Inti Pepyankh	miniature vessel	bowl with flat base and inclining sides	complete	51	24	29
130/AS22/2002_a	Inti Pepyankh	miniature vessel	censer on foot: lower part	complete	83	111	38
130/AS22/2002_a	Inti Pepyankh	miniature vessel	censer on foot: lid	complete	82	47	82
130/AS22/2002_b	Inti Pepyankh	miniature vessel	spouted carinated bowl on stand: bowl	incomplete	107	39	
130/AS22/2002_b	Inti Pepyankh	miniature vessel	spouted carinated bowl on stand: stand	complete	26	35	44
130/AS22/2002_c	Inti Pepyankh	miniature vessel	kebeh vessel	incomplete	33	113	31
130/AS22/2002_d	Inti Pepyankh	miniature vessel	bowl with convex base and vertical side	complete	118	19	
130/AS22/2002_e	Inti Pepyankh	miniature vessel	stand	incomplete	41	111	67
130/AS22/2002_f	Inti Pepyankh	miniature vessel	spouted jar	complete	16		25
130/AS22/2002_f	Inti Pepyankh	miniature vessel	wash basin	complete	101	56	49
130/AS22/2002_g	Inti Pepyankh	miniature vessel	nemset vessel	complete	27	56	25
130h/AS22/2002	Inti Pepyankh	miniature vessel	spouted jar	complete	20	59	29
134/AS22/2002	Inti Pepyankh	miniature vessel	spouted convex bowl	incomplete	115	22	
135/AS22/2002	Inti Pepyankh	miniature vessel	spouted convex bowl	fragment			

More complex structure of the data was uncovered, with some persons of higher status having rather small objects and vice versa. Continuing in this line of research, a paper is being written on the results of the application of artificial neural networks to a selection of data on Old Kingdom model tools, namely chisel blades.[32]

The case study is demonstrably material-dependent – we need first to have an idea of what can be done with a particular material and then accommodate the structure of the data to the formulated questions and working hypotheses. However, preserved material culture is usually represented by a stable set of data representing measurements and a description of other features and traits. By combining statistics with contextual information, we might be able to address the issues of the differences in the production and their meaning. Thus, it could be possible to reach beyond the simple search for analogies in other excavation reports.

A reader who expected a sophisticated treatise with showing off of the latest and most complex statistical methodology will probably be disappointed. What I wanted to demonstrate is that the fundaments of our approach to data and its structure need to be clear and simple to explain. Only detailed analytical parsing of data enables a later synthesis with datasets from other disciplines, such as archaeometallurgy in the case of copper artefacts, or with GIS data on sites and tombs, making spatial analysis possible. In selecting of the vocabulary, existing thesauri might be of help, e.g. Thot.[33] Fundamental explanations of database systems are also available.[34]

9 Conclusion

The aim of this article is to demonstrate that a simple description of the finds can lead to complex thoughts about their interpretation. Ancient Egyptian culture, with its rich material culture that is often mentioned or explained in ancient Egyptian texts and iconography, offers intriguing possibilities of intra-site, regional and supra-regional studies. This is especially the case for objects that were produced in regularized forms and shapes. In order to save time in data formatting, we have to think about their most useful initial structure first. Herein, I tried to propose a tabular representation parsing the information into the smallest possible units. Hopefully, this paper opens the discussion on the most useful possible ways of data presentation in the Egyptian archaeology, in the so-called "computer age".

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32 Daniel Gaude Fugarolas – Martin Odler, Whose tools are these? Artificial neural network applied to the classification of Old Kingdom Egyptian chisels, in preparation.

33 http://thot.philo.ulg.ac.be/index.html, last accessed 20.11.2019.

34 Adams/Strudwick 2008; Bergman 2008.

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Re-excavating Re-excavated Materials – A Case Study from the Royal Necropolis of the Early Dynastic Period at Umm el-Qaab/Abydos

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Naturally all objects deposited in a royal tomb are of considerable interest, especially since only a limited number of royal tomb inventories are preserved from Ancient Egypt. Thus, it is the main aim of the German Abydos project to gather as much as possible from the burial equipment, no matter how fragmented the objects are nowadays. That this endeavour has its limits due to a diversity of reasons will be discussed in this paper. On the basis of some examples it will be shown that the effort is nevertheless worthwhile, as also tiny bits and pieces can tell a lot of information revealing the immense quality and high standard of Early Dynastic workmanship that otherwise would be lost.

1 Introduction

Until the actual burial of the kings of the 1st Dynasty and the two latter of the 2nd Dynasty at Umm el-Qaab in Abydos could be substantiated by the resumed excavations on behalf of the German Archaeological Institute Cairo,[1] it was a wide-spread view that all kings of the first two dynasties were buried at Saqqara while the tombs at Umm el-Qaab served as cenotaphs or a 'southern tomb' for the kings of the 1st Dynasty and the last two kings of the 2nd Dynasty.[2] Beside the seemingly more elaborate tomb architecture, also the amount of finds seemed to favour Saqqara as burial ground.[3]

The paradigm "the larger the tomb, the more important the owner" was naturally transferred to the tomb architecture of the kings as well. On this basis it was quickly obvious that the huge mastabas with their impressive superstructures discovered at Saqqara are more sumptuous than the brick-lined pit-tombs discovered before at Abydos. Thus, for the longest time, the size of the tombs as well as the design of the superstructures were compared with each other, although only at Abydos stelae depicting the royal name were encountered and also the number of subsidiary burials far outnumbered those at Saqqara.[4] In addition, it was always difficult to explain, why

1 The excavations were initiated by Werner Kaiser in 1977 and transferred very soon to Günter Dreyer, who directed it until 2014 when it was passed to Christiana E. Köhler. For literature of the German excavations see the latest preliminary report with references to older publications in Dreyer 2017: fn. 1.

2 Stadelmann 1997: 10–34 with a good overview on the main literature concerning the two main positions cited in fn. 14. See also Engel 2003; Hendrickx 2008.

3 Emery 1954: 3.

4 See especially Emery 1961: 38–104; Emery 1954: 1–4. He was supported by further colleagues, see Stadelmann 1997: fn. 14.

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to some kings several mastabas of nearly the same size could be attributed at Saqqara and a few other places. It was Barry Kemp in 1966 who first took the enclosures at Abydos and the number of subsidiary burials into relation with their respective tombs when comparing the structures with those at Saqqara.[5] This led to a completely different picture revealing that the architectural lay-outs at Abydos were in fact much larger than those at Saqqara.[6]

The impression of the more substantial tomb equipment at Saqqara is readily to be grasped when comparing the publications of the two sites.[7] While in Saqqara lavish amounts of a diversity of objects in a good state of preservation were retrieved, the material from Abydos was to a large extent shattered into small bits and pieces. Although the excavators of Abydos tried to compensate this situation with considerable quantities of photographs and drawings, it remained difficult to get a good idea of the articles deposited in the tombs. In addition, it was impossible to present the amounts of objects, as in both excavations either no or only limited amounts of time were spent for reconstructing the fragments.[8]

This situation changed considerably during the German excavations (Fig. 1).[9] For the first time, the excavations were not only directed at the exposing of the architecture, but the surrounding dump hills containing the bulk of the tomb inventory were investigated as well.[10] Since 1993 the author was involved in the excavation and the processing of the tomb equipment of king Den as well as in the depositions discovered below the dump hills surrounding that tomb. Since then a lot of time was spent on sorting, joining and documenting the material in drawings, photographs and descriptions. There are, however, nevertheless a lot of hindrances for a complete reconstruction of the original tomb inventory.

2 Disturbing factors on the site[11]

2.1 Tomb robbing

As in many cases throughout time and space, the tombs were robbed soon after the burial. Signs for the robbing were encountered at all tombs. Thus, for instance, the walls between the subsidiary chambers at the tomb of Den were broken through directly below the roof.[12] The location of these holes makes only sense when conjecturing that the roof was still intact during the

5 Kemp 1966.

6 Kemp 1966; Kemp 1967. He was soon followed by Kaiser who pointed out the same arguments after he started his work at Umm el-Qaab, see Kaiser 1981; Kaiser 1982.

7 For Saqqara see especially Emery 1938; Emery 1939; Emery 1949; Emery 1954; Emery 1958. For Abydos see Amélineau 1899a; Amélineau 1902; Amélineau 1904; Petrie 1900; Petrie 1901; Petrie 1902.

8 Petrie mentions that he spent a lot of time for amending stone vessels, he does, however, not refer to other materials, see Petrie 1900: 18. This is also corroborated by the limited number of and randomly chosen pottery vessels published from Abydos.

9 For the latest excavation report with references on older publications of the German excavations see Dreyer 2017: fn. 1.

10 It has to be mentioned that this concept only developed in the 1990ies. At the beginning the excavations were restricted as well only to the architecture and some peculiar finds, such as inscribed pottery fragments and sealings, see Kaiser/Grossmann 1979; Kaiser/Dreyer 1982.

11 Abbreviated versions can be found in Müller 1998: 147–149; Müller 2006: 37–38.

12 Dreyer 1998a: 145–146.

Fig. 1: Map of Umm el-Qaab/Abydos (© DAI Kairo, drawing: M. Sählhof).

robbing. That the time-lapse between burial and robbing was rather short can best be recognized at the tomb of Khasekhemwy. In contrast to other tombs at Abydos, the roof of Khasekhemwy's structure was situated 5 m below the walking horizon involving that the pit was completely filled up with the diggings.[13] In addition, there are signs that the tomb was covered by a large tumulus.[14] Furthermore, the burial chamber was placed in a pit below the floor of the tomb and covered with plaster so that its location was not visible.[15] In spite of these protective measures, the burial chamber was directly affected by robbers' holes leading from the walking horizon vertically down between the sides of the pit and the brick lining leading then horizontally to the burial chamber.[16] As no robbers' holes were encountered at other places of the tomb, their location suggest that the robbers had precise knowledge of the position of the burial chamber. Thus, in all probability the robbers were either involved in the building of the tomb or were part of the personnel responsible for the filling of the tomb with grave goods or even the burial itself.

Be this as it may, judging from the objects recovered during the excavations it is quite certain that the robbers' endeavour was directed on the most precious objects of the tomb inventory, most probably objects made of metals and semi-precious stones, such as jewellery, weaponry and other prestige goods. As side-effect of robbing procedures a part of the grave goods certainly was destroyed either by the dropping of mud bricks from the robbers' holes, by trampling on the densely packed grave goods during the search for the more precious objects kept in boxes or inside the coffin and of course by ransacking the buried person in the search of the adorning jewellery and maybe weapons.

2.2 Burning of the tombs

At an unknown moment the tombs were burnt. Interestingly, the burning was directed on the royal burial chambers alone, while the subsidiary chambers were to a large extent spared. This consistent focus on the burial chambers of the kings excludes an accidental event but argues instead for an intentional act of destruction.[17] Furthermore, the two royal tombs from the late 2nd Dynasty were not affected by the fire. Therefore, two time spans were proposed: Either, the middle of the 2nd Dynasty for which period political turmoils can be reconstructed,[18] or, the First Intermediate Period. For the latter surmise a passage in the 'Teaching for Merikare' could be referred in which the destruction in the Thinite nome is mentioned.[19]

The fire had a much worse effect on the preservation of the grave goods than the tomb robbery. Especially in the tombs of Den and Djer, the fire was very severe resulting in the baking of the mud-bricks walls of the thicknesses up to 4 m.[20] Some of the bricks as well as some pot-

13 Dreyer 1998b: 164.

14 Dreyer 2003: 110.

15 Dreyer 2003: 108.

16 Dreyer 2003: 111.

17 This is in contrast to Petrie's supposition of an accidental burning, see Petrie 1900: 7.

18 This was transmitted in a personal communication by Jochem Kahl to the author.

19 See in Quack 1992: 71. He refutes, however, this interpretation, see Quack 1992: 81–82. That the burning of tombs took place after the Old Kingdom at Abydos could be observed by Janet Richards for instance in the tomb of Wnj, see Richards 2002: 100.

20 For the tomb of Djer see Petrie 1901: 9 and for the tomb of Den see Dreyer 1998a: 141–142; Müller 2009: 13; Müller 2013b: 256 fn. 6. In contrast to the tombs of Djer and Den, other tombs were only affected in the upper parts where the beams of the roof had been inserted into the walls, see Engel 1996: 58; Engel 2006: 94.

Fig. 2: Fragment of an inlay made of ivory, partly burnt, tomb of Den (Ab K 411) (© DAI Kairo, photo: F. Barthel).

tery vessels even melted.[21] Naturally, a large part of the grave goods completely disappeared in the fire. Interestingly, however, from the pieces which survived can be concluded that at a certain point during the fire the roof broke down covering a part of the grave goods, so that unburnt fragments can be joined with burnt fragments (Fig. 2). But, as will be shown below, also completely burnt fragments still hold interesting information.

2.3 Restoration of the tombs

Also at a point that cannot exactly be dated, parts of the tombs were restored with unbaked mud-bricks.[22] Naturally the restoration took place after the burning of the tombs. Some scarce evidences point to a date at the beginning of the Middle Kingdom,[23] but it also could have happened a bit earlier.

Although only small parts of the tombs were restored, it is obvious from the location of the restorations that a secure access to the royal chambers was intended.[24] For this endeavour large parts of the material filling the royal chamber as consequence of the burning and the collapse of the roof had to be removed.[25] As till the modern excavations the majority of the preserved grave goods were encountered in the dump hills surrounding the individual tombs, the material taken out of the burial chambers was obviously deposited in the immediate vicinity.

This process of re-deposition of the grave goods certainly entailed additional fragmentations.

2.4 Osiris cult

It is most likely that the restoration of the tombs were directly connected with the installation of cultic activities for Osiris that were inaugurated in the late Old Kingdom.[26] Interestingly, the Osiris cult was not only focused at the tomb of Djer as burial place of Osiris, but was encountered at all royal tombs. In the course of these cultic activities which lasted until the Roman

21 The melting of the bricks and pottery is based on personal observation.

22 For restorations in the tomb of Djer see Dreyer 2013: 20; for the tomb of Den see Dreyer 1998a: 141–142; Dreyer 2000: 124; Dreyer 2003: 111; Müller 2004; for the tomb of Qaa see Engel 1996: 64–66; for the tomb of Khasekhemwy see Dreyer 1998b: 165.

23 See fn. 22.

24 Engel 1996: 58; Dreyer 1998a: 141–142; Dreyer 2003: 111.

25 The complete clearance of the royal chambers in the course of the restorations could best be attested in the tomb of Qa'a. Here a cup from the 12th Dynasty was unearthed directly on the wooden floor of the king's chamber which was covered by several clearly discernible layers of wind-borne sand which themselves were concealed by a staple of loose bricks, see Engel 1996: 64–66, Abb. 21a, Taf. 13c.

26 For the latest publications with references on earlier literature to the Osiris cult see Budka 2019; Effland/Effland 2013. In recent years pottery and other objects from the late Old Kingdom could be attested, see Budka 2019: 16; Effland/Effland 2016: 34; Müller 2004: 145.

period[27] a lot of depositions were arranged some of which are situated relatively close at the tombs.[28] When considering that at this period already dump hills existed around the tombs from emptying the royal burial chambers, we have to account for further relocations of material.

2.5 Destruction by Copts and search for gold

Also during the Coptic period activities could be detected at the royal tombs.[29] While at the tomb of Khasekhemwy an installation consisting of a diversity of vessels could point at a living place of a monk or a storage place for jars on his way to the mountains, it is surmised that in this period a range of destructions took place.[30]

In the following centuries a lot of activities in the search of gold and other treasures are attested throughout Egypt and at Abydos a variety of objects dating to the 10th to the 16th centuries AD were discovered.[31]

We have no record on illicit diggings in the course of the emerging interest in Egypt by Europeans from the 16th century onwards. But judging from the amount of objects that arrived in European collections we have to reckon with more disturbances in the course of search for precious objects.[32]

2.6 Excavations in the 19th and 20th centuries

As a result of the development of Egyptology several excavations were undertaken at the site. Nothing is recorded about the activities that took place under the auspices of Mariette at Umm el-Qaab in the 1860ies. It is, however, well-known that his teams were active in all parts of Abydos and thus in all probability also at the royal cemetery of the Early Dynastic Period.[33] Although published in three large volumes, Emile Amélineau was not able to retrieve a conclusive picture of the royal cemetery or even to reconstruct the sequence of the kings after his excavations from 1895 to 1898.[34] He was, however, the first modern scholar who recognized the historical importance of this site. From his excavation report it becomes clear that he did not uncover the tombs systematically from one end to the other, but that instead parts opened and cleared from interesting objects were refilled with the rubbish from neighbouring parts. All excavated objects that were not taken by the museum in Cairo, were transported to Paris where a large part was sold during an auction in 1904, while a part stayed in his private collection.[35] As can be gleaned from his publication, during his excavations a lot of objects were complete but he was also interested in fragments of broken objects which exhibited interesting details.

Although excavated in a much more systematic way than Amélineau, Petrie also refilled emptied parts of the tombs with the rubbish of newly opened structures in his clearance of the cemetery in the two winters of 1899/1900 and 1900/1901, i.e. immediately after Amélineau had left the site.[36] Also his excavation resulted

27 Effland 2013; Effland 2014; Effland/Effland 2013: 126–129.

28 See for instance the depositions to the north of Djer's tomb complex in Budka 2019: 21 fig. 1.4.

29 Effland 2013; Effland/Effland 2013: 130–131.

30 Effland/Effland 2013: 131.

31 Effland 2008; Effland/Effland 2013: 132–135.

32 For a short overview of attested visitors of Abydos see Effland/Effland 2013: 135–138.

33 Petrie 1900: 2.

34 Amélineau 1899a; Amélineau 1899b; Amélineau 1902; Amélineau 1904.

35 Vente Amélineau 1904.

36 Petrie 1900; Petrie 1901; Petrie 1902.

thus in a more complex relocation of the material. Like in Amélineau's case, the better preserved objects were transported to Cairo, while the majority of the excavated material consisting of bits and pieces were taken to London where they were auctioned and spread to a large diversity of private and public collections.

Interested in the discovery of new tombs, Édouard Naville re-excavated in 1909–1910 only small parts of the known tombs and concentrated instead on the areas not touched by Amélineau and Petrie in the surrounding areas of the tombs.[37] While he cleared the tomb of Peribsen completely, the tombs of Djer and Den were only partly excavated.[38] Although in the text he mentions that he decided to excavate the tomb of Djer entirely once more, on the published map can be gleaned that he focused on the burial chamber and a few subsidiary chambers only. In addition, he mentions that he stopped at the staircase of the tomb of Den and entered his burial chamber.[39] Contrary to his predecessors, he used a narrow-gauge railway and removed the material deposited in the vicinity of the tombs to an area far to the east of the tomb of Den and to the northwest of the tomb of Peribsen.[40] The number of published objects is very limited. Not surprisingly, the new dump hills he created are thus full of relocated materials from all periods. Due to the huge size of these dump hills, it was not possible to include their clearance into the re-investigation of the German excavations.

Finally, Walter B. Emery spent some time in the early 1930es at Umm el-Qaab and focused most probably on the tomb of Den.[41] He did not give any report on his activities. That work was done at the tomb could, however, be gleaned from the considerably lower level of filling of the royal chamber of Den's tomb and the low level of material covering the walls when the German Archaelogical Institute started its work at Abydos. In addition, to the east of the tomb irregular dump hills were encountered next to the staircase which according to the map and photographs published by Naville had been removed during his work there. Thus, also Emery's investigations resulted in the displacement of some material.

2.7 Tourism

Since at least 200 years Abydos was an attractive site visited by myriads of tourists.[42] Usually, visitors are not particularly interested in potsherds or small fragments of broken objects, but it cannot be excluded that some material disappeared in the course of the visits. Even if only minor numbers of objects were taken away, a lot of material was further fragmented or even completely destroyed by trampling over the site. Furthermore, it has to be accounted for the displacement of fragments, as people interested in old stuff use to pick up fragments while walking and dropping them at other places, when not interested anymore.

2.8 Environment

Last but not least, also the effects of the environment should not be neglected. The destructive effects of the wind on unbaked mud-brick

37 Naville 1909; Naville 1910; Naville 1914.

38 Compare the plan published in Naville 1914: pl. XXI in which the areas investigated are indicated.

39 Naville 1914: 35.

40 In his reports he only mentions that he used the railway-gauges but not where he delivered the material, see Naville 1909: 2–3; Naville 1910: 1–3; the rails are visible in Naville 1914; pl. XVIII.

41 See Kaiser/Dreyer 1982: 211 fn. 2.

42 For visitors of the 19th century see Effland/Effland 2013: 135–138.

architecture was already noticed by Naville who argued that this was one reason why he refrained from re-opening all tombs at Umm el-Qaab.[43] The destructive force is also nowadays visible in a quite short period of time.[44] But not only mud-bricks are easily affected by the wind, the effects are also visible on other objects. Thus for instance, Petrie was able to locate the original place of erection of the royal stelae on the basis of the state of their surface condition.[45]

Although only encountered a handful of times during a century, rains have a devastating effect on the objects. The desert keeps a lot of salt-crystals in the sand which dissolve during the rains and spread over the goods imbedded. These salt-crystals break the objects open and cause additional fragmentation.

Further fragmentations, dislocations and destructions are caused by a diversity of animals. Thus, termites destroy wood and other organic material; saurian, snakes, a variety of mice and other animals living in the desert build holes and nests which also results in the relocation of material.

2.9 Effects of the disturbances

Many factors of disturbances led to the destruction, fragmentation and dislocation of the objects on the site and the mixture of grave goods with that of the neighbouring tombs. Thus, even when thoroughly gathering all fragments which are still on the site, only a part of the original tomb inventory is still available. In addition, a lot of fragments are nowadays distributed in museum and private collections around the world handicaping their reconstruction further. Furthermore, the dislocation of the material complicates the attribution of the grave goods to their respective original placement.

3 Attribution of the objects to specific tombs and to the location inside the tombs

Due to the disturbing factors discussed above, it is rather challenging to reconstruct the objects' original location. The difficulties are not restricted to problems concerning the placement of the goods inside the tombs, but also the correct attribution of the items is a complex task.

In this respect the fire that attacked the tomb is of considerable value. As only the royal chambers were affected by the burning, it is easy to attribute all burnt objects to these localities. More care has to be taken with the relocation of the unburnt material. The reconstruction of fragmented objects revealed that unburnt pieces can be fitted with burnt remains (Fig. 2). The fact that not the complete material shows stains of burning that was once deposited in the royal chamber definitely goes back on the collapsing of the chamber's roof resulting in the covering of parts of the grave goods which were thus protected from the fire.

In general one would assume that material found inside the chambers and in their immediate vicinity should be identical or at least closely related with the location of their original placement. That this reasoning might be misleading has been discussed above, as the degree of dislocation depends very much on the size and layout of the royal chamber as well as the number of activities that took place at the tombs. Thus, for instance the tombs of Den and Djer were more often investigated by modern excavators than the others. Due to the staircases, the entry to and the possibilities of easy removal of the fillings were an easier task than for tombs without a

43 Naville 1914: 35.

44 Adams 2012; Gleeson et al. 2017.

45 Petrie 1900: 6.

staircase. Also, the amount of material that had to be taken out of the royal chambers caused a more sophisticated system of working procedures. Furthermore, when considering the layout of the cemetery, it becomes evident that some parts of tombs are more affected by material mixed with that of the neighbouring tombs than other parts. Thus for instance, a location at the edge of the cemetery leaves at least two sides of a tomb more or less free from the effects of mixing, while a placement in the middle of the cemetery asks for more care in the attribution.

The degree of mixture can best be gleaned from the inscribed material. Fortunately, a lot of objects had been inscribed with the royal name or with the names of officials that can be attributed to specific kings.[46] The majority of inscriptions can be found on inscribed sealings used for a variety of items, such as pottery vessels, bags and boxes.[47] Tags made of ivory and bone were once attached to oil jars, textiles, sandals and further items.[48] Also some of the stone vessels, gaming pieces, weapons, furniture and some other objects carried once a royal name. It seems rather straightforward that objects associated with the inscribed material derive in their majority from the same tomb.

But also this conclusion cannot be taken without some restriction. Firstly, there are several clear evidences of heirlooms. Thus, for instance a stone vessel fragment bearing the name of Narmer (Fig. 3) was found in the dump hills to the south of Den's tomb.[49] Although reasons could be brought forward that this fragment once was transferred from Narmer's tomb to Den's burial place by one of the diverse reasons mentioned in the section of disturbing factors, there are two main arguments which rather suggest that the vessel represents an heirloom. The strongest argument concerns its state of preservation: as it is heavily burnt, it cannot originally have been deposited in the tomb of Narmer, as that tomb had not been set on fire. Furthermore, there are other cases in which heirlooms could be attested. For instance, a complete stone cylinder jar bearing the name of Aha was found in tomb S 3036 at Saqqara which dates to the reign of Den.[50] Also in this case a direct mixture with the content of a neighbouring tomb can be excluded due to the large distance of the mastaba dating to the reign of Aha.[51] The most plentiful case in this respect is presented by the tomb of Djoser which contained a lavish number of inscribed stone vessels of all predecessors encompassing the 1st and 2nd Dynasties.[52]

Secondly, there is proof for the immediate successors having delivered items inscribed with their names for the funeral. This habit is easily recognizable for succeeding kings who were buried at Saqqara, such as king Hetepsekhemwy and king Djoser, for both of which inscribed sealings have been encountered at the tomb of Qaa and the tomb of Khasekhemwy respectively.[53] It is also traceable for items bearing the name of

46 The extent of inscribed material in the royal tombs can best be gleaned from the excavation reports by Amélineau, Petrie and the German excavations. Meanwhile the first volume dedicated to the publication of the Early Dynastic cemetery at Umm el-Qaab was published, see Engel 2017.

47 Besides the volume of Engel 2017 and the excavation reports see also Müller 2012. For a definition of the different types of sealings see Engel/Müller 2000.

48 For the use of tags see Dreyer 1998d: 113–145; Engel 2017: 314–352.

49 Kuhn 2017: 78–79.

50 Emery 1949: 76, pl. 19B.

51 For this tomb, S 3357, see Emery 1939.

52 Lacau/Lauer 1959; Lacau/Lauer 1965.

53 For sealings of Hetepsekhemwy in the tomb of Qaa see Dreyer 1996: 71–72; for those of Djoser found in the tomb of Khasekhemwy see Dreyer 1998b: 166; Dreyer 1998c.

Adjib whose tomb is in quite a distance of Den's grave.[54] More difficult to interpret are, however, objects with the name of Djet or Meret-Neith which were found between their tomb and the tomb of Den. For those items each of the three graves could be the original place of location.[55]

In the case of the grave goods belonging to the tomb of Den, several criteria could be worked out implying their attribution to that grave (Fig. 1). Firstly, material deposited in the dump hills on the south-western part and the north-eastern part can with great certainty be attributed to his tomb as no other tombs are in the immediate vicinity. Furthermore, in the case of the north-eastern dump hill the location of the staircase leading to the royal burial chamber at this side was by far the easiest and most direct way for the removal of its filling. Secondly, only in Den's tomb the floor of the burial chamber was covered with slabs of granite, gray granite as well as rosary granite,[56] many fragments of which were found in the surrounding dump hills together with burnt brick fragments. Thirdly, in a lot of cases the dispersion of fragments belonging to the same object encompassing all areas of the tomb ascertains an attribution to Den's tomb. This is for instance the case for the fragmented inlay shown here in Fig. 2 whose parts were collected in areas T-SW + T-S + T-W + T-NO + T-OO (see Fig. 4 for the locations of the find positions).

At the same time, these dispersions also reveal the extent to which some fragments spread revealing that some pieces were distributed to areas which cannot be explained by the activities of tomb robbers, excavators or other direct involvement at the tombs proper but must be the result of other types of visitors at the tombs.[57] And finally, the concentration of fragments especially belonging to wine jars in the south-eastern part of Den's tomb can easily be explained with the existence of vast chambers used as magazines for these vessels, as the bottoms of the oblong chambers are covered with the impressions of hundreds of wine jars.[58] The dispersion of the

Fig. 3: Stone vessel fragment with the name of Narmer inscribed, Calcite-alabaster, burnt, tomb of Den (Ab K 5093) (© DAI Kairo, photo: F. Barthel).

54 The stone vessels of the tomb of Den were the subject of the dissertation of Robert Kuhn accomplished in 2019 who is in the process of publication.

55 Kuhn 2017: 77.

56 Amélineau 1899a: 124–125; Petrie 1901: 9; Dreyer 1998a: 142.

57 For the spread of material in the tomb of Qaa see Engel 2017.

58 Dreyer 1993: 59, pl. 11c.

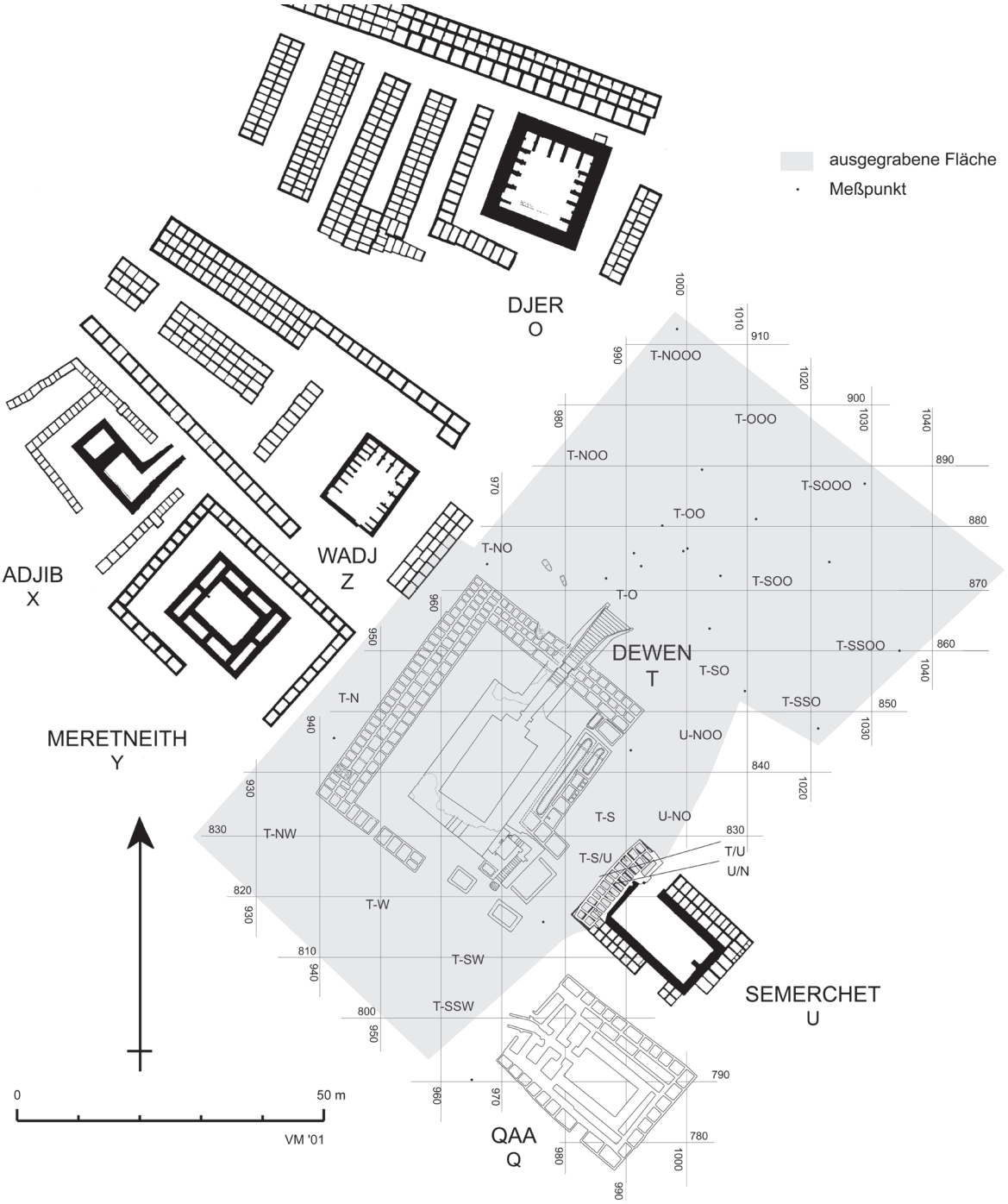

Fig. 4: Map of the tomb of Den with designations of the areas of origin (© DAI Kairo, drawing adapted by V. Müller).

objects throughout the cemetery also revealed that the excavators worked in many cases from north to south. The reason for this procedure can be found in the direction of the wind which is most often blowing from the north, as working against the wind is rather painstaking.

4 Dealing with large amounts of fragmented objects

Although the tomb robbers stole the most precious items, the fire destroyed the majority of grave goods in the royal burial chambers and former excavators removed a lot of the material, still several thousands of objects are left of the former burial equipment.[59] The quantity of material that has to be processed is even higher, as the majority is broken into small bits and pieces. During the excavation each fragment was therefore labelled with a shortened designation of its find position (see Fig. 4) so that dislocations and dispersion could be reconstructed and thus the most probable attribution to its place of origin. This procedure was done with fragments of pottery vessels, stone vessels and objects belonging to other categories alike.

The largest amount of deposited objects consists of vessels made of pottery and stone. For both categories only a limited amount of fragments could be reconstructed to complete vessels or at least complete profiles. All vessels of which a considerable part was preserved were drawn, photographed and their data inserted into a database. Of the tens of thousands of fragments the diagnostic pieces were drawn, such as rims, bases and handles as well as pieces with paintings, inscriptions or pot marks, while the wall fragments were counted and weighed according to wares and types. Together with the dispersion of the inscribed material, the distribution of the vessels is building the basis for the attribution of the material to the specific tombs and the chronological development of the material.[60]

In contrast to the vessels, each fragment of the other object categories was documented as single item with drawings, photographs and descriptions inserted in a database – at least as long as part of the original surface could be detected. This effort seemed to be warranted, as so many fragments of the same or similar items are distributed in the diverse museums around the world. The documentation should make a possible reconstruction more promising on the basis of the envisaged publication – especially since the appearance and character of some objects are difficult to discern when the state of preservation is too fragmentary. It was also interesting to note during the documentation that many of Petrie's illustrations were not well identifiable because he often only produced line drawings without shadowing and only a minority was photographed. Thus, for instance, an inscribed object made of ivory was illustrated only partly by a photograph and interpreted by him as handle of a measuring cord.[61] Fragments belonging to a similar piece were found during the German excavations in subsidiary chamber T-O 3[62] and area T-S (Fig. 5a–d). They both represent gaming pieces in the shape of granary models typical for the *snt*-game. The inscriptions name "follower of *ḫ3st.j*" (i.e. the *nzw-bjt*-name of Den) and the name of a grain, here *bd.t*, i.e. barley, together with the *ꜥnḫ*-sign in its typical

59 A good impression is given by the publication of the tomb of Qa'a, see Engel 2017.

60 Confer for this procedure Engel 2017.

61 Petrie 1901: 25, pl. VII/13.

62 For the designations of the locations inside the tomb see Dreyer 1993: 58, Abb. 13.

Fig. 5a–d: Gaming piece with inscription made of ivory, partly burnt, tomb of Den (Ab K 980 + Ab K 10665) (© DAI Kairo, photo: F. Barthel; drawing: V. Müller).

form of the Early Dynastic period.[63] Petrie is of course not to be blamed for a false understanding, yet the lack of a photograph showing the whole object, also from the broken side, as well as technical drawings forced the reader, however, to rely on his interpretation.

Amélineau on the other hand had only documented fragments of the more peculiar objects. While the illustrations are also difficult to read, only one side of the object is represented by the photographs. The latter is naturally also valid for Petrie's photographs.

Fig. 6: Fragment of stone vessel with decoration made of green siltstone and gold leaf application, tomb of Semerchet (Ab K 6195 = MoA R 1073) (© DAI Kairo, photo: F. Barthel).

5 Informative value of fragments – Reconstructing objects from bits and pieces

Even if only preserved in small parts, the objects encountered in the royal tombs reveal their high quality. This applies not only to the diversity of exclusive materials, such as precious stones and metals or ivory, but also to the high standard of manufacturing techniques which were already available in this early period.[64] Most obvious are these exorbitant qualities and high level of craftsmanship in the variety and technical perfection of stone vessels.[65] It seems that no kind of stone was spared, even from coarse-grained stones, such as rosary granite, delicate thin-walled plates were produced. Nearly all stones were available in Egypt. Small quantities were, however, imported such as obsidian which was either imported from Ethiopia or southern Turkey[66] and lapis-lazuli which came from Afghanistan. While the latter was only used for the production of beads, small vessels were made of obsidian.[67]

Naturally due to the many disturbing factors only very tiny amounts of gold could still be detected, but the few preserved pieces clearly reveal that gold was widely used for the covering of stone vessels (Fig. 6)[68] and furniture (Fig. 7a–b). That the wooden piece was also gold plaited can be deduced from the use of fine textiles which was soaked with resin for fixing the gold on the surface of the stone vessel fragment in Fig. 6. The existence of textile on the wooden fragment must have served the same purpose. The fragment was found to the northeast of the tomb of Den (T-NO, see Fig. 4) and could thus likewise derive from the tomb of Djet. The latter's tomb was, however, less affected by fire. The reading of the

63 For a discussion of the two pieces see Müller 2000: 111–113 with fig. 22d. At that time only the larger part was known, the additional fragment with the *ꜥnḫ*-sign was only later found. For the reading as *ꜥnḫ*-sign S34 see Regulski 2010: 184, 256.

64 See Engel 2017 for the tomb of Qa'a. The amount of material used in the tomb of Den was much larger and more lavish than that in the tomb of king Qaa.

65 Kuhn 2017; Hendrickx 2008: 66; de Putter 2000.

66 Bavay et al. 2000.

67 Engel 2017: 409.

68 Müller 2013a: 39, Abb. 25b.

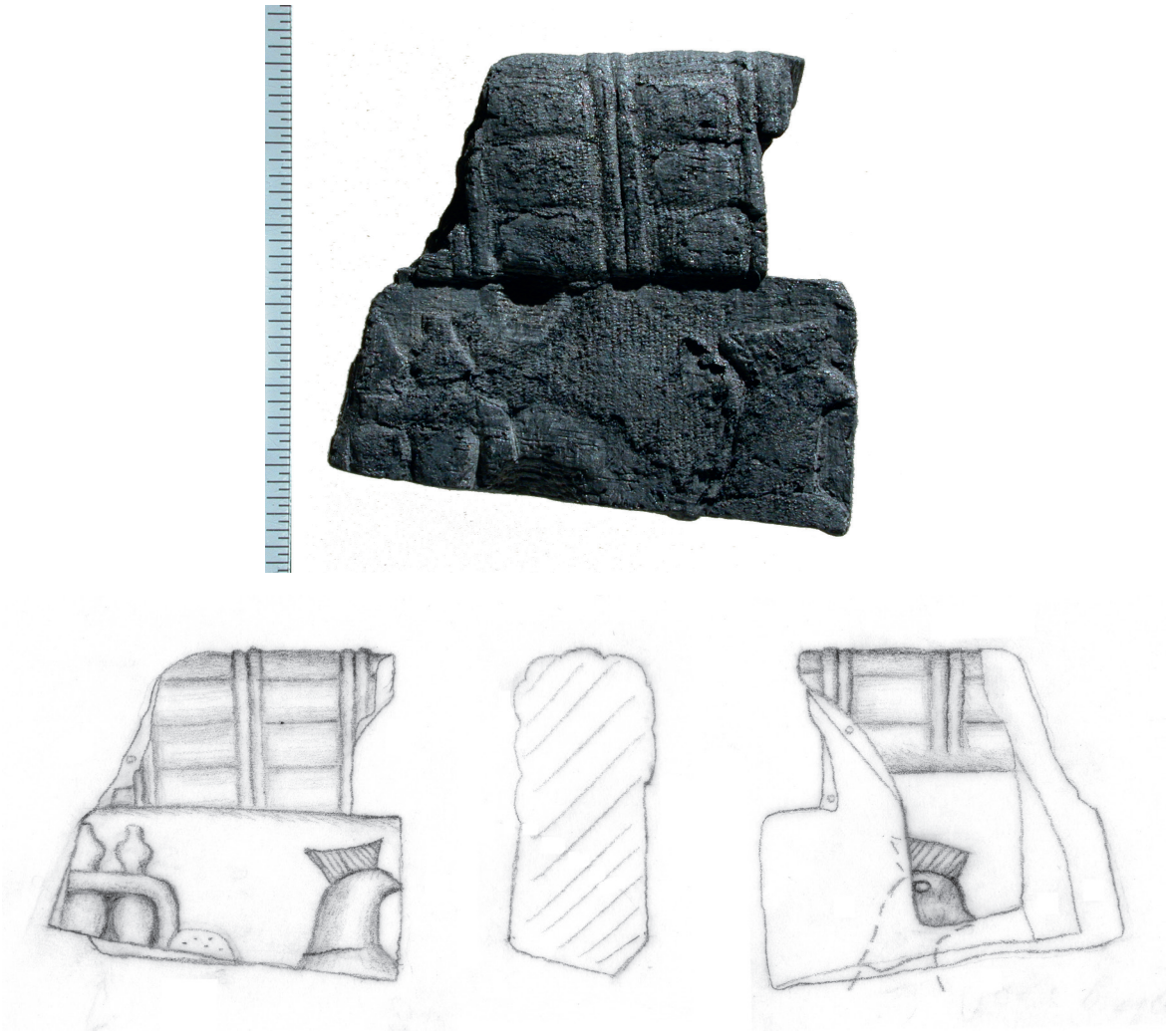

Fig. 7a–b: Fragment of decorated furniture with inscription, charred wood, tomb of Den (Ab K 977) (© DAI Kairo, photo: F. Barthel, drawing: P. Müller).

inscription is not straightforward: the combination of a bird with the sign W17 is reminiscent of the reading "*ḫntj*" as part of *ḫntj-jmntjw*, i.e. the god Chontamenti, were it not for the bird's head, which proposes a reading as G22, the hoopoe. This sign was albeit not yet attested in the Early Dynastic period.[69] Although only small pieces are preserved, it is recognizable that the furniture resembled in many respects those discovered in the tomb of Hetepheres at Giza.[70]

The decoration on fragments like this one as well as pieces made of ivory and bone reveal that the imitation of perishable material was in wide use. Ropes, reeds and other plant material were lavishly translated into other materials made of wood, ivory and stone. The tiny piece of ivory

69 Regulski 2010.

70 Reisner 1955.

Fig. 8a–b: Fragment of decorated furniture made of ivory, tomb of Den (Ab K 05330) (© DAI Kairo, photo: F. Barthel, drawing: V. Müller)

Fig. 9: Fragment of a gaming piece in the shape of a lion made of ivory, tomb of Den (Ab K 382) (© DAI Kairo, photo: F. Barthel).

Fig. 10: gaming piece in the shape of a lion from the tomb of Djer, Cairo JE 43939 (after Petrie 1901: pl. VI/3-4).

Fig. 11: Legs of a board game in the shape of bulls' legs, made of ivory, from the offering place to the south of Djer's tomb (Ab K 6070a-b = MoA R 548a-b) (© DAI Kairo, photo: F. Barthel).

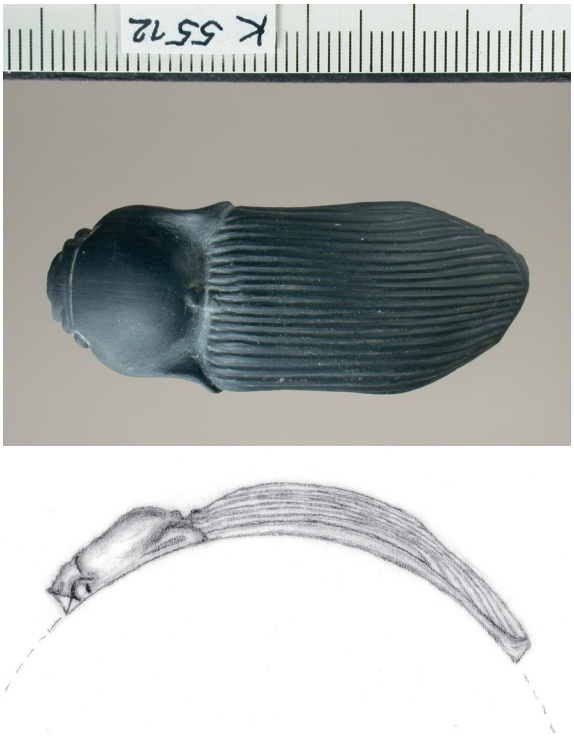

Fig. 12a–b: Fragment of an armlet in the shape of a beetle, made of black siltstone, tomb of Den (Ab K 5512 = MoA R 1060) (photo: F. Barthel, drawing: I. Nebe).

(Fig. 8) discovered in the royal burial chamber of Den represents reeds wound together with other reeds. Similar fragments were found by Petrie in the tombs of Den, Djer and Semerchet[71] – it is at the moment not determinable from which tomb this piece originally came.

But also the depiction of animals or at least parts of them played an enormous role. Lions (Figs. 9–10) and dogs made of ivory were used as gaming pieces. The legs of furniture and board games (Fig. 11) made again of ivory are constructed in the shape of bulls' legs and stone armlets could be decorated in the shape of beetles (Fig. 12). The piece of armlet was found to the east of the tomb so that the probability that it came from Den's tomb is rather high.[72] This type of beetle is connected with the goddess Neith and often depicted twice as mirror-inverted.[73]

For more abstract designs, inlays made of ivory, bone, wood and faience were in wide use for all kinds of boxes, stools and beds (Fig. 2).[74] These abstract designs imitate in many cases colourful woven mats. Ivory was also used for other objects, such as bracelets, gaming pieces, clappers, etc. In their majority it derived from hippopotami, but a small amount was definitely taken from elephants. Different kinds of local wood were used for a variety of objects, next to furniture, coffins as well as parts of tools and weapons were pro-

71 Müller 2000: 113 with fn. 186.

72 Müller 2003: 91.

73 Hendrickx 1996; Adams 1999.

74 For inlays used for a diversity of boxes see Müller 2016.

duced of this material. Also rather simple materials were encountered among the grave goods, such as reeds, papyrus and other plants for boxes or unbaked mud, which was not only used for a large amount of sealings, but also for models of granaries[75] and for a variety of gaming pieces. Textiles were an important commodity not only for garments but also for a diversity of other purposes, such as for coverings of vessels before they were sealed or for stabilizing stone vessels inside boxes.[76]

In many cases the fragments themselves reveal enough for giving an impression of their original appearance. For the identification of others, comparative material from contemporary tombs are necessary. In this regard, the good state of preservation of the huge mastabas at Saqqara, Helwan, Abu Roash and other places are of unmeasurable importance.

6 Aims of the project

The main aim of the project is naturally the reconstruction of the original tomb equipment of king Den and its attribution to specific chambers and areas inside the tomb. It is also of interest to characterize the diversity of objects used for a royal burial.[77] Which objects had their purpose during the funeral? Which objects were considered important for the here-after? Which objects were a royal requisite and which were independent of the social status? What is an heirloom and what a present of funeral attendants or the royal successor? Does the funeral equipment of the subsidiary burials differ from contemporary burials of the middle or lower class?

The vast amount of inscribed sealings will allow for important insights into the administration of the 1st Dynasty as many offices, administration units and titles are mentioned. The analyses of the pottery vessels will not only reveal the wares and types in use of a royal tomb in the 1st Dynasty, but it will also suggest which vessel types were part of the general trading network of the country as a whole and which types were of a more restricted nature. It should also be possible to elucidate some special workshops. A side-effect of the tomb's location in the middle of five other tombs will furthermore allow for the establishment of a fine chronology of vessel types due to the mixed nature of the material found in the dump hills.

Finally, the presentation also of the tiny and on first glance unspectacular fragments will hopefully activate some attentiveness to material still kept unnoticed in some museum storerooms.

75 Müller 2018.

76 Jones/Killen 2008.

77 Preliminary thoughts on some aspects were formulated in Müller 2013b.

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"...*half a loaf is better than no bread*"*

On the Fragmentary Nature of Early Archaeological Publications and Their Utilisation in the 21st Century

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W.M.F. Petrie is without doubt one of the most influential figures in late 19th/early 20th century Egyptology. This impact, lasting until today, is based not just on his advancement of methodology and excavation techniques, but also on the great number of publications he produced during his long career. Due to the destructive nature of archaeological research, these publications remain an important and irreplaceable source for modern Egyptologists. Based on a reassessment of the New Kingdom remains of the cemeteries of Sedment in Middle Egypt, unearthed during the 1920/21 excavations, this article analyses the 1924 publication of the site. The main focus is laid upon the questions of how much of the archaeological finds and features are included in the publication, and whether certain criteria can be identified that determined the inclusion or exclusion of information in the publications. As can be shown, only a minor part of the findings was published, and while some groups of finds, such as Myceanean pottery, were presented virtually complete, plain domestic pottery or finds from the Ramesside period in general are underrepresented in the publication. As not all on-site documentation has been preserved, the possibilities of any reassessment of a given site are limited. Nonetheless, the value of the publications still remains, as long as a sound source criticism is carried out.

1 Introduction

William Matthew Flinders Petrie is without doubt one of the most influential figures in late 19th/early 20th century Egyptology. His aim was to prepare a monograph on any excavation, ideally within one year. This led to a great number of monographic publications[1], most of which are relatively brief. This approach also holds true for other early scholars, some of which were disciples of Petrie.

As publications of early excavations (i.e. late 19th and early 20th century) remain an important

* From the preface of Petrie's 1886 publication of Naukratis (Petrie 1886: 1).

I want to express my thanks to Thomas Gertzen, to whom I owe several suggestions, hints to literature, and remarks out of his great knowledge of Petrie and the disciplinary history of Egyptology, and to Garry Shaw for correcting my English. All mistakes remain, of course, my own.

1 For a bibliography of W.M.F. Petrie, not including articles and other shorter papers, see Drower 1995: 466–469. A complete bibliography can be found in Uphill 1972.

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– and due to the destructive nature of archaeology irreplaceable – source, this paper will take a closer look at the nature of these publications and the consequences for new research into sites that were excavated a long time ago. The approach chosen for this article is a rather pragmatic one, taking the author's own perspective as a present-day Egyptologist and archaeologist who needs to make use of Petrie's excavation reports.[2]

Today, Petrie's publications are viewed controversially. Jason Thompson bluntly states that "*Subsequent research into his papers has shown that he never published more than portions of his findings, and not always the best portions*"[3]. A judgement based on research regarding a specific site is made by Karin Sowada. Referring to Petrie's publication of Diospolis Parva, she states: "*While some of Petrie's records of the excavation are still extant, the publication itself presents relatively little information.*"[4] Other authors commenting more generally on Petrie stress the fact that he published almost all of his excavations without lengthy delays. Thomas Gertzen, for example, concludes that "*Er* [Petrie, H.F.] *publizierte die Ergebnisse seiner Grabungen zeitnah, was weder für die damalige noch die heutige archäologische Forschung eine Selbstverständlichkeit ist*".[5] This verdict replicates the contemporary view of Adolf Erman, expressed in 1929: "*… etwa so wie in England. Da wird alljährlich die Arbeit des vorigen Jahres veröffentlicht, in einfacher Form und gewiß nicht so erschöpfend, wie unsere Forscher es verlangen würden, aber das Nötigste wird doch veröffentlicht und kommt der Wissenschaft zugute*".[6]

While it surely holds true that Petrie did not publish everything, it has to be stated that "a complete publication" – whatever that might be – was never Petrie's aim; more than once, he explicitly expressed that he was aware of them being "*defective*".[7] And, in contrast to many other Egyptologists up to today, he indeed promptly published, according to his valuation, the major results of most of his excavations. Thus, the most important question to be dealt with must be whether the advantages of a quick publication of some results compensate for the major shortcomings. In order to address this question, this article will provide tangible evidence for what Petrie published and what he did not publish. Moreover, a focus of this paper will be the reality of how he published, and how he dealt with the archaeological evidence in connection with his manner of excavation and documentation. The two-volume record of the excavations at the

2 The author is an archaeologist who has a long experience of using Petrie's publications (Franzmeier 2017), but is neither a historian specialized in 19th and 20th century history, nor the disciplinary history of Egyptology in particular.

3 Thompson 2015: 21. This remark is unfortunately not substantiated by any reference to existing literature or own research. For the shortcomings of Thompson's "Wonderful Things – A History of Egyptology", see Gertzen 2016.

4 Sowada 1996, referring to Petrie 1901.

5 Gertzen 2017: 61.

6 Erman 1929: 241. This statement follows a section on the problem of Robert Koldewey's never appearing or long delayed publications. Even though he refers to "England" in general, it can be assumed that he had Petrie and his disciples, such as Brunton, on his mind. Moreover, it needs to be stressed that Erman was a philologist, interested in new texts and not an archaeologist. Thus, he might not have realized the problems deriving from Petrie's work regarding archaeological contexts, which had already been observed by other contemporaries, such as George Andrew Reisner. See below paragraph 5.

7 Petrie 1886: 1. See below in paragraph 2 for the full quotation.

site of Sedment in the winter of 1920/21[8], which were reassessed by the author, will be used to analyse the realities of Petrie's publication strategy in detail, and to supply data to the discussion about his publication practice. Practical problems for any modern scholar undertaking a reassessment of an old excavation will be highlighted; these are connected to the fragmentary nature of the publication, the already biased documentation, and the often heavily disturbed archaeological contexts. Solutions and the potentials connected to a re-examination of archaeological material excavated in the earlier days of Egyptology will be demonstrated. This article and its results do not, of course, cover all of Petrie's incredibly rich work, and its results cannot be generalised; rather, it will add to the study of a specific publication from one of his last excavations in Egypt, after almost 40 years of work in the country. It might encourage other archaeologists, dealing with material from Petrie's excavations, to provide further evidence for the realities of the actual work of Petrie, his documentation, and publication.[9]

2 Petrie as a Prolific Writer: His Approach

Without doubt, W.M.F. Petrie can be considered one of the most prolific authors that Egyptology has ever seen. He published 108 (or 102[10]) monographs between 1874 and 1953. Even though 31 were co-authored and three appeared after his death, the number remains impressive.[11] Amongst them were no less than 47 excavation reports. Moreover, he also penned a huge amount of smaller publications, resulting in a bibliography containing 1024 items.[12] One of the reasons for this large number of publications is a very high work efficiency, while the underlying motivation to publish so many works is expressed in Petrie's credo: "*It is a golden principle to let each year see the publication of the year's work, in any research; but a writer places himself thus at the disadvantage of showing how his information may have been defective, or his views requiring change, as year after year goes on. Such a course, however, is the most honest and most useful, as half a loaf is better than no bread.*"[13] He can surely be said to have followed this motto throughout his life, even though sometimes a publication might have taken a little longer.[14] He summarized the aim of his publications as follows: "*So far as my own credit is concerned I look mostly to the production of a series of volumes, each of which shall be incapable of being altogether superseded, and which will remain for decades to come–perhaps centuries–as the sources of facts and the references on their subject*".[15] This shows that Petrie was well aware that, because of the destructive nature of archaeology, for many sites there could be no better publication in the future. However, he seems not to have had in his mind that future

8 Petrie/Brunton 1924.

9 Of course, this article is not the first to deal with Petrie, his excavations, and publications. But the author has gained a very deep insight by reassessing all documented New Kingdom contexts and finds from the 1920/21 excavations at the site of Sedment. See Franzmeier 2017.

10 Uphill 1972: 356 gives 102 books, while the bibliography of Drower 1995: 466–469 contains 108 works, some of which are co-authored and some further are posthumous.

11 The data of Drower 1995: 466–469 was used.

12 Uphill 1972: 356.

13 Petrie 1886: 1.

14 The 1920/21 work at Sedment (work finished the April 25th, 1921) was published in 1924 (Petrie/Brunton 1924).

15 Petrie 1932: 112.

Egyptologists would also make use of his documentation. Even though this remains somewhat speculative, it might point towards an understanding of the documentation as being just for his own use in the preparation of publications and perhaps not for future colleagues.

In his 1904 work "Methods and Aims in Archaeology", Petrie devotes a whole chapter to the question of publishing.[16] It revolves less around the question of what shall be published but how it should be done. He gives absolute priority to the preparation of plates: "*The arrangement of the plates must precede the writing of the details of the book*"[17]. And indeed, the importance of plates is highlighted by the fact that many of his later excavation reports contain more plates than text.[18] Afterwards, he talks about the necessity of presenting the material on the plates in a comprehensive order, establishing criteria such as the type of object (e.g. inscriptions, pottery etc.) and the need for a chronological order.[19] Moreover, he points out that every object needs to be identifiable. The remainder of the chapter mainly concerns different types of printing qualities and procedures for plates, with the background of explaining how to achieve the best possible publication at a reasonable price both for the producer and the potential reader. This part actually represents about five of the chapter's eight pages, most likely reflecting not just Petrie's frugal nature, but the economic necessities of his situation in contrast to better funded institutions.[20]

In the end, Petrie did not always have a scientific audience in mind; his list of publications also includes books aimed at a more general audience, or as Petrie himself put it, "*… readers who feed in the intermediate regions between the arid highlands and mountain ascents of scientific memoirs and the lush – not to say rank – marsh-meadows of the novel and literature of amusement.*"[21] Though more irregular, it shows his awareness of the need to communicate his results to the public. It can be guessed that these pub-

16 Petrie 1904: 114–121.

17 Petrie 1904: 114.

18 In qualification, it should be stated that the plates often also contain tomb registers and other types of tables, which in other publications might have been part of the text and not the plates. Regarding the increase of the number of plates over time, it might be guessed that printing plates had become cheaper in the years after 1910 compared to the 1880s.

19 See paragraph 4.7 for an assessment of the implementation of these criteria in the case of Sedment.

20 Except for criticizing "Greenwell's British Barrows" (Petrie 1904: 114, referring to Greenwell 1877), he does not explicitly mention any other work, Egyptologist, or institution. Nonetheless he refers to "*wild freaks of recent books in Egyptology*", calling them "*monumental*" (Petrie 1904: 117). This might indeed be understood as criticism of publications of much better funded institutions, where good funding might have met the lack of common sense so that "*Every absurdity which want of design, forethought, and common sense could perpetrate, seems to be found in these monumental works*" (Petrie 1904: 117). Moreover, publications "monumental" in appearance might have been deemed abhorrent by Petrie who expressed his non-approval of luxury in his 1907 work *Janus in Modern Life* (Petrie 1907). He states, discussing taxation as a means of "moral education": "*If instead of taxing income (which is often requisite for reasonable living, or else usefully on improvements of the world), we had the luxuries taxed, the only people to complain (if the change were gradual) would be those who wasted instead of using their income*" (Petrie 1907: 52–53). In the following text, he explicitly mentions commodities, such as "*spacious rooms*", "*costly food*", "*motorcars (not professionally needed)*", or "*entrance money for amusements*" as such luxuries.

21 Petrie 1892: 1.

lications also served the purpose of publicising his work in the light of the constant need for funding to pay for his excavations.[22]

3 Petrie's excavation reports: The effects of the on-site documentation upon the publication

As any excavation report is normally based on information recorded on site, Petrie's recording strategy deserves attention; understanding the recording strategy is also crucial for any reassessment of an excavation, and its results, that go beyond the publications. Even though his documentation has already been subject to research, some key issues will be addressed in the following discussion.[23] In his 1904 work "Methods and Aims in Archaeology", Petrie writes "*To state every fact about everything found would be useless, as no one could wade through the mass of statements.* […] *It is absolutely necessary to know how much is already known before setting about recording more. In some periods, such as the XVIIIth Dynasty, so much is ascertained that it is seldom that new facts can be brought to light; and only fine or unusual discoveries are worth full publication. On the other hand, in such an age as the early dynasties our only resource lies in complete records of the levels or collocations of hundreds of pots, whole or broken; and most important historical conclusions may hang on a single potsherd.*"[24]

Of course, not everything can be recorded, and modern (and future) technological developments allow, and will allow, for the recording of data that Petrie could never have recorded. Similarly, an early 21st century archaeologist will not be able to record what a 22nd century archaeologist will.[25] Moreover, modern excavations experience limitations based on manpower, time etc. for recording, making it necessary to define an adequate accuracy.[26] Nevertheless, the shortcomings of the work of the late 19th and early 20th centuries related to the general conditions of the time have to be taken into account, even though they should not be criticized *per se*. More problematic is Petrie's definition of what I call adequate accuracy. He refers to "*how much is already known*" as a key factor. While this is easily understandable, it would require the excavators to be fully aware of all that is "*already known*". Under these circumstances, the quality and the knowledge of the excavators responsible for documentation is decisive. An extremely good understanding of the material culture is beyond doubt for Petrie himself, as well as for some of his collaborators, such as Guy Brunton, who had a lot of experience in Egyptian archaeology. But Petrie always also had team-members who were not Egyptologists or archaeologists by profession – interested laymen with useful

22 Sparks 2013. See especially page 3 for Petrie's use of the Biblical connections to attract funding.

23 E.g. Serpico 2008a.

24 Petrie 1904: 49. While he refers in the rather infamous statement regarding the 18th Dynasty to the publication, the chapter's topic is recording, and it can be supposed that what was considered not being worth full publication might have already influenced the documentation.

25 As an example for modern techniques, 3D recording using photogrammetry might be mentioned.

26 The general difference between the accuracy of excavations of paleolithic sites and the work in an Egyptian settlement site such as Qantir, where cubic meters of pottery sherds have to be processed, might serve as an example. For reflections and definitions of "adequate accuracy" – "adäquate Genauigkeit", see Pusch Unpubliziertes Manuskript: 195.

skills.[27] These might not have realized the rare nature of any given find or feature and dismissed very rare finds as usual.[28] Moreover, even already known types of features and finds might be very relevant when interpreting archaeological features and particular finds.[29] Besides potential problems during the excavation itself, some mistakes, especially regarding inscriptions, persisted into the publications.[30] A very striking example from Sedment shows a combination of two orthographic variants of the same name on a set of shabtis, forming a completely new name; the misinterpretation of a sign also led to a change in the person's gender.[31] Further mistakes relate to the wrong attribution of pottery as "foreign".[32] Thus, these individuals' capability to act in the way Petrie sketched out in 1904 can be doubted. The Egyptian workforce surely can be identified as another factor, even though they were not involved in the documentation.[33] Any assessment of the qualities of particular workmen, whose names can sometimes be linked to the excavation of particular tomb groups through notes on tomb cards or in the notebooks, would be very difficult and is beyond the scope of this paper.[34]

Last but not least, it should be mentioned that the reality of work and documentation of Petrie's excavations sometimes differs greatly from his own aspirations and methods. Numerous anecdotes prove his sometimes very unorthodox way of working, including the direction of workmen and team-members using a telescope.[35]

4 Case Study: The excavations at Sedment

The paragraphs above discuss some of Petrie`s own thoughts and the conditions under which he worked. But how did these translate into the reality of a publication? As has been outlined already, it was never Petrie's aim to publish everything. Therefore, a confirmation of the first part of Thompson's criticism, mentioned in the introduction to this article, would not at all come as a surprise. Whether indeed "*the best portions*" were published or not remains a very subjective issue, which might also be influenced by different research questions and the approaches of various

27 For the team-members working with Petrie at Sedment in 1920/21, see Franzmeier 2017, 33–37. Useful skills were, for example, related to first aid, camping, and dealing with the simple conditions found at excavations in Egypt in general and Petrie in particular. The Egyptian workforce surely can be identified as another aspect.

28 See paragraph 4.2 for some examples of rather unusual objects neither documented beyond their mention on a tomb card or in a notebook or published.

29 Even though the number of shabtis in Sedment was extremely high and the monetary value very low, the prosopographical information gained by a complete documentation of all inscriptions would have been valuable. See below, paragraph 4.4 and Franzmeier 2016b.

30 Petrie himself was hardly able to read hieroglyphs, and he normally drew upon the expertise of philologists, such as Wilhelm Spiegelberg. See Drower 1995: 204.

31 Franzmeier 2017: 59 with Abb. 3.7.

32 See below, paragraph 4.1.1.

33 Petrie describes the functions of the workforce in a chapter "*The Labourers*" in Petrie 1904: 20–40. On page 22 he states that "*The freshman from England is their* [the workmen H.F.] *inferior in everything except in recording.*"

34 For a modern discussion of the Egyptian workforce, see Quirke 2010 with a list of tombs and the Egyptian workmen that excavated them (Quirke 2010: 169–197).

35 Drower 1995: 411.

periods and trends in Egyptological research. In order to supply the discussion with a point of departure, the following paragraphs present and discuss data which the author gathered during his work on the New Kingdom finds from the 1920/21 excavations at Sedment in Middle Egypt.[36]

Between December 1920 and April 1921, more than 2,000 archaeological contexts, mainly tombs, were excavated by Petrie and his team, which consisted of eight members plus the Egyptian workforce.[37] Besides Petrie, Brunton, and their wives, Major H.G.C. Hynes, Elmer Montgomery Neilson, Henri Bach, and Edward Eustace Miller worked at Sedment.[38] Based on approximately 110 working days over the period mentioned, every day, at least 18 tombs were cleared, with every team-member having to oversee and document two or three a day.[39] The documentation therefore had to be conducted in quite a hasty way. More problems arose from the topography of the excavated area, because the cemeteries are spread over a distance of about 6 km from north to south. The area was so large that Brunton decided not to join Petrie's camp, but to set up another camp in the south of that region.[40] This might have negatively influenced the communication between the two parts of the team. It is likely that tomb numbers assigned twice or even thrice to contexts in different cemeteries might stem from this situation.[41]

The contexts excavated show a great chronological variety, dating from the Early Dynastic Period to the Roman or even the Coptic Era. While the majority of tombs can be dated to the phases between the late Old Kingdom and the early Middle Kingdom, the focus of this paper will be the New Kingdom.[42] From the New Kingdom, 253 tombs are known. Most of the data derives from previously disturbed contexts, as only 14 or 15 contexts were found intact. Out of these, only about five comprised relevant find-groups, while four contained no objects except for the bodies and mats or undecorated and undocumented coffins. Their dating thus remains uncertain and is based only on the estimation of the date on the tomb cards, which cannot be substantiated by any evidence.[43]

4.1 The 1924 publication

In the case of Sedment, a two-volume publication was prepared.[44] It did not appear in print until about three years after the end of the work on site – delayed, when compared to Petrie's stan-

36 Franzmeier 2017.

37 The exact number is impossible to identify. Tomb cards or notebook entries exist for 874 tombs; the highest tomb number is 2253 and on the published plans 2,542 features are marked, with many of them without a number assigned.

38 For the team, see Franzmeier 2017: 33–37.

39 As a matter of fact, not all team-members were in Sedment for the whole period, and the documentation would also include photography and the drawing of objects. The time on site, overseeing and documenting the actual excavation was therefore even less. See Franzmeier 2017: 40.

40 See Franzmeier 2017: 39–41. The reason for the choice can be assumed to be the distance, even though this cannot be proven.

41 See below paragraph 4.6.

42 For a modern, but brief general coverage of the cemeteries of Sedment, see Grajetzki 2005, and Bagh 2011: 151–174. For the First Intermediate Period and the early Middle Kingdom in particular, see Seidlmayer 1990. An overview of the secondary literature can be found in Franzmeier 2017: 78–79.

43 Franzmeier 2017: 357–362.

44 Petrie/Brunton 1924.

dards and to his other works. Petrie co-authored it with Guy Brunton, who was responsible for three of the book's nine chapters, covering about 17 of the books 33 paginated pages. In total, the publication consists of 91 plates juxtaposed with 41+VIII pages of written text.[45]

In the case of Sedment, the transfer of the documentation into the publications is another factor that might have influenced the contents of the book. Letters show that part of the preparation was done by the team members after the excavation, and that notebooks often remained with the team members for a long time and not with Petrie himself. While not much is known about the concrete circumstances of the preparation of the Sedment volumes, one detail sheds some light on the writing process, which seems to have taken place towards the end of 1922: "*I send you herewith all the plans drawings etc also my note books. I had intended to bring them up to you in the Xmas Holidays by which time I had hoped to have finished the whole lot.* […] *I am wondering why you wish my note books. I thought I had made my tomb cards very clear have I failed to do so?*"[46] While this sheds some light on the publication process, it might also mean that team members continued to work on their documentation; the question emerges of how much of the preserved documentation was actually prepared on site, and what might have been added from memory.

Moreover, there is evidence that drawings and photographs of some finds were only prepared in England after the excavation.[47] Thus, the inclusion of objects in the publication would be related to the process of choosing which objects would be brought out of the country and which were not. As most objects that had been brought to England were already sent to the museums in the autumn of 1921, they were no longer available for drawing or for the checking of drawings during the preparation of the publication, further influencing what could be published and to what degree.[48]

4.2 What was published?

A total of 577 objects from the New Kingdom are depicted on the plates. This is about 16 % of the 3,683 objects – the minimum deducible from the documentation and the objects identified in museums.[49] Most of these objects were published in drawing, and a few in photographs. Only a

45 The pagination only reaches page 33. The remainder concerns the distribution list and the index. Eight plates in contrast contain tomb registers. While the highest plate number is XC, there is a plate XXIVA in addition to XXIV.

46 Letter by Major H.G.C. Hynes to Petrie, dated to the 10th December 1922; quoted from Serpico 2008a: 6.

47 Petrie/Brunton 1924: 9: "*The many models of boats and other objects were photographed by Prof. Petrie in London. To Mrs. Myrtle Broome we are indebted for the copy of the inscriptions and decoration of the two coffins of Nekht-kaui*". The coffins of Nekht-kaui were obviously also copied in London because there is no evidence Myrtle Broome was present in Sedment. As they were ultimately sent to the Ny Carlsberg Glyptothek in Copenhagen, they definitely left Egypt. For the coffins, see Petrie/Brunton 1924: 12–13, and pl. XXIV–XXV, and Jørgensen 2002: 62–67.

48 In most museums the inventory books prove an arrival of the objects in 1921. See Franzmeier 2017: 49–50.

49 The actual number of objects that once existed is most likely significantly higher, because the information on tomb cards is often vague. If an unquantified plural such as "vessels" or "shabtis" is used, two objects are being counted while "fragments" are always counted as just one object, because they might pertain to just one find.

very small number were shown in both photos and drawings.[50]

The second parameter is the number of archaeological features mentioned in the book. 157 tombs from all periods are mentioned in the text[51] and 457 can be found in the tomb registers. Moreover, objects from 546 tombs can be found on the plates. As not all tombs from which objects are shown are in the tomb registers or the text, or vice versa, in total 673 tombs are represented in the publication. Compared with the total of at least 2,000 tombs, this means that only about 8 % are mentioned in the text, 27 % have objects depicted[52], 23 % are contained in the tomb registers, and about 34 % are mentioned at all. It must be added that tombs from which single objects are depicted on the plates are particularly problematic; these finds are left in a kind of void, with no information available regarding their context. As not all tomb cards are preserved, these objects themselves are the only information regarding certain tombs.[53]

4.2.1 Over-representation of specific groups of objects: foreign vs. Egyptian ceramics

Another aspect of the publications (and already the documentation) is the focus on the extra-ordinary as perceived by Petrie and his collaborators. While it is of course legitimate to focus on objects relating to important research questions, this can lead to wrong impressions. One example is the emphasis on foreign objects in general, and imported pottery in particular. Most of the Egyptian pottery, especially if undecorated, is only mentioned on the typological plates or in the tomb registers. If depicted, sometimes more than one tomb number is given for a certain type. Other pottery is just mentioned in the register of graves with a type number. Broken vessels are hardly mentioned at all; even in the documentation, they just appear as "fragments" without any further specification. Foreign pottery, in contrast, is treated differently and appears to a much larger percentage, giving, at first sight, the impression of being quite common. Out of the 132 New Kingdom tombs, 26 are published as having foreign pottery with at least 51 vessels. But this rate of about 20 % does not reflect the reality. In total, the reassessment revealed 78 imported

50 This "double publication" pertains mainly to architectural fragments and the tomb group 254. See Petrie/Brunton 1924: Pls. LV, 1–14 and LVII, 32–40 (tomb 254) and Pls. LXXI, 4, 6 and LXXII, 6/LXXIII (architectural fragments from tomb 201). The choice of objects seems quite random. In general, photographs were most often taken of high-quality objects that were also difficult to draw, such as figure vases.

51 At least sixteen tombs are only mentioned in the text without being mentioned in the tomb registers or with objects figured. Most of them seem to relate to tombs excavated by M. Neilson or Major Hynes (Petrie/Brunton 1924: 14–15 and 32–34).

52 The list of "*graves with objects figured*" contains 220 numbers, but in most cases not the tombs where only pottery is included on the plates (Petrie/Brunton 1924: Pl. LXXIX). It also contains at least one error, as the dish on plate XLII, 1 does not pertain to tomb 1319 but to 1314, according to the number on the plate and in the tomb register. Moreover, the number 1319 is followed by 1315. It also misses tombs with objects figured, such as 2017 of which a cosmetic vessel is figured on plate LXVI, 9.

53 As my reassessment focused on the New Kingdom, the documentation pertaining to tombs of other periods was not subject to detailed research. One such case of the New Kingdom relates to tomb 601 where an openwork mummy-board and a ceramic stand were published (see Franzmeier 2017: 1306–1307). As the two objects belong to the Late Old Kingdom/First Intermediate Period and the New Kingdom, due to the lack of documentation, it cannot be excluded that the number was assigned to two tombs.

vessels, with the majority coming from Cyprus and some Myceanean and Levantine vessels.[54] This means that more than half of the vessels were published. After the reassessment, 37 tombs can be shown to have yielded imported pottery, a rate of about 15 %. Moreover, the number published is subject to the problems relating to the terminology and the identification of imported pottery in the documentation. Several examples show that pottery identified as "foreign" is actually Egyptian, making it impossible to give a secure number without examination of the vessels themselves, even more-so if it concerns unpublished vessels. A paradigmatic example is a vessel from tomb 245. On the tomb card, "*fragments foreign 6 or 7 pots*" are mentioned, while the notebook mentions "*fragments usual foreign pottery* [illegible] *18th Dyn*". As no other pottery from the tomb is mentioned, it seems likely that three fragments from a pilgrim flask, today housed in the Hunterian Museum in Glasgow (inv.-no.: D.1921.107), can be identified with parts of these "foreign fragments".[55] In fact, these fragments, neither figured nor described in the publication[56], belong to a pilgrim flask of Egyptian production, as evidenced by the fabric II.A.02[57], while the floral decoration is far from "usual". This treatment of the unknown or unusual as "foreign" makes any further evaluation of the real rate of foreign pottery mere speculation.

4.3 What was not published?

The most important bias in the publication, especially in the plates, relates to the ratio of the images (both drawings and photographs) of finds outside their context *vs.* the archaeological contexts. Only four *in situ* pictures were published[58]. One more picture, showing an unfortunately unknown tomb, has survived in the archive of the Petrie Museum of Egyptian Archaeology in London.[59] Moreover, only 25 plans – mere sketches – of tombs were published.[60] Out of these, only seven give details, such as the find spots of objects and the position of bodies. All the others just reveal the architecture; and, with the exception of five Early Dynastic tombs, only floor plans are given and no sections. Moreover, amongst the tombs of which Petrie published plans, there are three of which nothing else was published: no

54 Every mention of a "foreign" vessel on a tomb card or in the notebook is taken as one vessel, unless proven wrong by the analysis of a preserved object. Furthermore, the number of vessels is a problem as often just "fragments" are mentioned, which could relate to one but also many more vessels. As this problem often cannot be solved with certainty, each mention of "fragments" is counted as one vessel while a mention of "vessels" or "jars" will be counted as two vessels. Thus, the number of vessels of both categories can be assumed to have been higher.

55 Franzmeier 2017: 61–62 and 908–912.

56 Tomb 245 is mentioned in Petrie/Brunton 1924: 26 and finds are shown ibid. pl. LXIII, 245.

57 For the fabric terminology used, see Aston/Mommsen/Mountjoy/Pusch/Rehren 2005. In general, no modern fabric terminology could have been used by Petrie and his collaborators, because the Vienna System, on which the system used here is based, was only invented in the 1970s.

58 A very small image of the finds in tomb 560 (pl. I, 1), the *in situ* situation of the famous statues of Mery-re-ha-ishtef of Dynasty 6 in tomb 274 (Pl. XI, 3), and two images of the New Kingdom chapel 276 (Pl. XLIX, 1, 2).

59 Serpico 2008b: 130 (PMAN 3522). In general, the use of photography for documentation at Sedment can be called antiquated for the 1920s. For the methodology of photography used by Petrie see Serpico 2008a: 7–10 and below 4.7.

60 Petrie/Brunton 1924: Pls. LXXXI–LXXXIV.

finds, no description, and not even a mention in the tomb registers.[61]

For all the other tombs, only the descriptions in the text or the documentation can serve as a base for any reconstruction of the archaeological contexts.

The majority of the text, and especially the plates, is occupied by finds; the quantitative data of published finds to objects found on site was already mentioned above. From a qualitative perspective, the following observations can be made:

1. Even though the impression is given on several plates that tomb groups were published, they are almost never complete. Even for the most important features, such as tomb 201 of the vizier (Pa-)Rahotep, almost all small-finds are missing, including the shabtis, which held relevant prosopographic material.[62] This also holds true for the important group of serpentine vessels from tomb 132, which represents one of the largest corpora from any single tomb of New Kingdom Egypt.[63]
2. The later New Kingdom, i.e. the 19th and the 20th Dynasties, is under-represented, especially if the large group of finds from the tomb of (Pa-)Rahotep (201) – even though it was published incomplete – is taken out. This holds especially true for the large corpus of shabtis, typical for tombs of this period.[64]
3. While monumental inscriptions were published, the vast majority of smaller inscriptions, mostly related to shabtis, were not; these shabtis were simply neither documented nor brought to museums.
4. Except for six objects, no finds dated to any period later than the New Kingdom were published.[65] The presence of a much larger amount of post-New Kingdom material is evidenced not only from tomb cards and notebook entries – which might be false – but also by objects that were sent to museums. Even though I did not search for them in the course of my research, a couple of such objects appeared. They belong to reused contexts, but also to genuinely later features.[66] Moreover, objects of a New Kingdom date, which were thought to be later by the excavators, are missing. One example is pottery coffins. None of them were published, while all recorded examples were dated to the "*22nd Dynasty*" on tomb cards and in notebooks. The reassessment of some of them – recovered in a "cache", created by Petrie and his team in an empty tomb – by an Egyptian team in the 1980s and 1990s, proved their New Kingdom date.[67]
5. Very simple burials were not published at all. While today it would have been desirable information, no wrappings or mats – often the only containers for the bodies – were described or even depicted. This leads to an almost complete absence of this supposed lower stratum of society in the publication, and distorts the view towards the higher social status.

61 This applies to tomb 266 (18th Dynasty), and tombs 568 and 569 (both 2nd Dynasty).

62 For the tomb of the much-discussed vizier (Pa-)Rahotep, see Franzmeier 2015, and Franzmeier 2017: 776–813.

63 Franzmeier 2017: 709–712.

64 This under-representation is repeated in the finds preserved in museums. See Franzmeier 2016b.

65 Petrie/Brunton 1924: Pl. LXI, 77, and LXII, 117–120.

66 Tomb 326 is the burial of a bovine, according to the tomb card. A large wedjat-eye from this feature is now in the collection of the Fitzwilliam Museum and dates to the late Ptolemaic or early Roman Period (Inv.-No. 081.1921).

67 Galal Abdel Fattah/Aston 2003 and Franzmeier 2017: 46.

6. No data related to skeletal material was published, except for the presumed sex and sometimes the age at death of human remains found in tombs.[68] The criteria on which the sex determination was based are nowhere stated, and it cannot be excluded that grave goods might also have had an influence. Moreover, the data seems to have been taken from the tomb cards and notebooks; this makes the sex determination process even less transparent, because it is most likely that the same person was not always responsible for the examination of human remains.[69] The same holds true for the age determination, even though, except for the tomb register on plate XLVII, only "child" or "adult" are discerned, and it can be assumed that body size was the decisive parameter. Thus, within this publication, Petrie's interest in anthropometry and eugenics seems to have played no role.[70]

Moreover, several inconsistencies can be observed, with highly unusual and even potentially valuable objects left unpublished. Amongst them are objects from some tomb groups mentioned above under 1). For instance, it is not clear to me why not more of the huge group of serpentine vessels from tomb 132 were published. As already expressed, the corpus is exceptional in coming from one context, both for its size and its quality. In addition, there are types amongst the unpublished fragments that should have been unknown to Petrie. For one type, I only know of three parallels, one of which Petrie himself later excavated in 1930 at Tell el-Ajjul, and which therefore should have been unknown as a type to him.[71] Another example is a faience situla, which is amongst the most magnificent examples of this type of vessel from the later New Kingdom.[72] It might be guessed that within the huge number of contexts and finds, combined with inexperienced team members and the lack of capacity for documentation, many pieces might have simply escaped the attention of Petrie and Brunton, especially if the objects were not complete or broken, as in the case of both objects mentioned above. Also, the process of writing up might have played a role regarding the objects missing in the publication. The above-mentioned circulation of notebooks and the transfer of information onto the tomb cards is surely a factor, and might have caused mistakes or simply led to the loss of data.

As a last point, it should be added that an evaluation of the excavated material is almost non-existent. This goes hand-in-hand with the very few references to other works in the text, most of which refer to parallels in previous publications by Petrie himself.

68 Petrie himself took measurements of skulls, mainly of the First Intermediate Period, as is evidenced by the preserved notebook 95c. Moreover, at least 67 skeletons of the First Intermediate Period are preserved at the Duckworth Laboratory of the University of Cambridge (pers. comm. Emily Barlow 2012). None of this data was published though.

69 See Franzmeier 2017: 374–376. Another problem is the (non-)mention of the state of preservation of human remains. The very good preservation conditions for organic materials at many tombs at Sedment makes it likely that corpses might have been preserved as mummies with visible sexual organs. But the preservation of mummies can only be proven for tomb 276a (Franzmeier 2017: 1092–1102). Thus, the only way to determine the sex of tomb owners in Sedment are inscriptions which are rare in comparison to the total number of tombs.

70 See Perry/Challis 2013 for this topic.

71 0132/GSt/005, Oxford Ashmolean Museum AN 1921.1404. See Franzmeier 2017: 721–722, 1758 for the object and further references. The two other parallels were found decades later in Hazor and Saqqara.

72 0413/GFa/001, Sydney Australian Museum E026806. See Franzmeier 2017: 1213, 1832.

4.4 Under- and over-representation of periods

For the New Kingdom, 132 tombs are known either from objects on plates, the tomb registers, or the text. During the reassessment, from the existing documentation and the objects in museums, it was possible to deduce most likely 253 tombs from the New Kingdom.[73] Thus, the New Kingdom in general is over-represented, with about 52 % of the tombs known from the publication, when compared to the overall rate of only 34 %. Also, the tombs most likely pertaining to the later Second Intermediate Period seem to be over-represented.[74] In contrast, all periods after the New Kingdom are not only underrepresented, but virtually missing; there is only one object shown on a plate dated to the 22nd Dynasty, and some more mentioned in the text or in the tomb register.[75] Moreover, finds pertaining to the Ramesside period, except those from the 19th Dynasty elite tombs, such as the tomb of (Pa-) Rahotep, are under-represented. About 80 % of the Ramesside finds can only be deduced from the documentation, while about 50 % of the 18th Dynasty finds are known either from the publication or from museums.[76] Amongst the features presented, the distribution is more even, both within the text and within the plans of tombs.

Nonetheless, the 18th Dynasty is thus over-represented both in the publication as well as in the surviving finds. This calls for an explanation, as already in 1904, Petrie had explicitly stated that regarding the 18th Dynasty "*seldom new facts could be brought to light*".[77] This is most likely related to the excavation's funding, which was based upon providing donors with finds. High-quality artefacts from daily life, such as cosmetic equipment, seem to have sparked a higher interest than rather mediocre Ramesside shabtis. A quite bizarre case relating to First Intermediate Period boats and scenes of daily life probably best highlights the mechanisms at work. It shows that museums could and would connect their funding for Petrie to the order of specific types of objects, threatening Petrie with the withdrawal of the already made contributions afterwards in the case of non-delivery. From the correspondence between Petrie, his wife, and the Ipswich museum, it is clear that the "*collection sent*" was not acceptable. As the majority of the objects received by the museum were Ramesside, including a group of shabtis from tomb 131, this episode can be taken as evidence for the low appraisal of such objects.[78] In addition, some known prices underline the process that led Petrie and his team to place Ramesside shabtis in lower esteem, in contrast to 18th Dynasty objects, such as beautiful cosmetic spoons.[79]

73 Due to the limited number of finds, the dating of a small number of these tombs is uncertain. Moreover, these objects are often not preserved in a museum or documented beyond a mention on a tomb card or in the notebook. In total about 10–15 tombs are affected by this situation.

74 No detailed reassessment – which would be necessary – has been conducted by the author; the impression is based on the quite large number of tombs from this period known from the publication (87), in contrast to the tombs known from the documentation (approximately 100).

75 Petrie/Brunton 1924: Pl. LXI, 77. Mentions include "*poor burials of the XXVIth to the Ptolemaic times, and a considerable amount of the poorest Roman*" (Petrie/Brunton 1924: 14).

76 Franzmeier 2016b: 112 (Tab. 2).

77 Petrie 1904: 49. For the complete quotation, see paragraph 3 above.

78 For the correspondence, see Serpico 2008b: 109–110 and Franzmeier 2017: 43–46.

79 Franzmeier 2016b: 110–111.

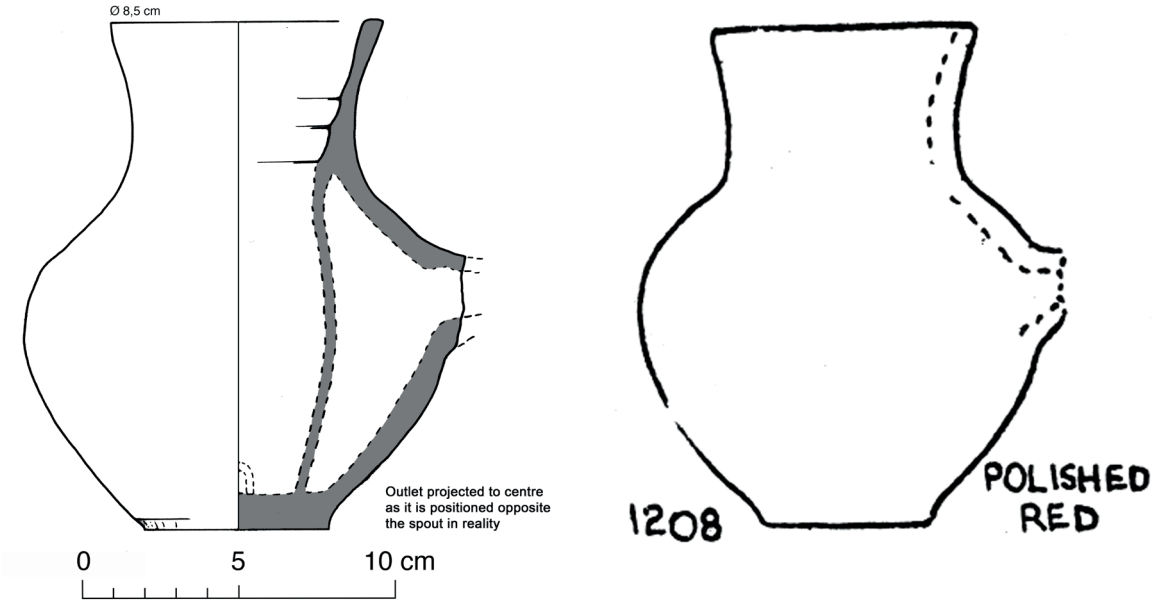

Fig. 1: The unusual jug from tomb 1208 (1208/GKe/001; London UC 18962). On the left the authors's drawing. To the right the drawing by Winifred Brunton (after Petrie/Brunton 1924: pl. LXV, 89N).

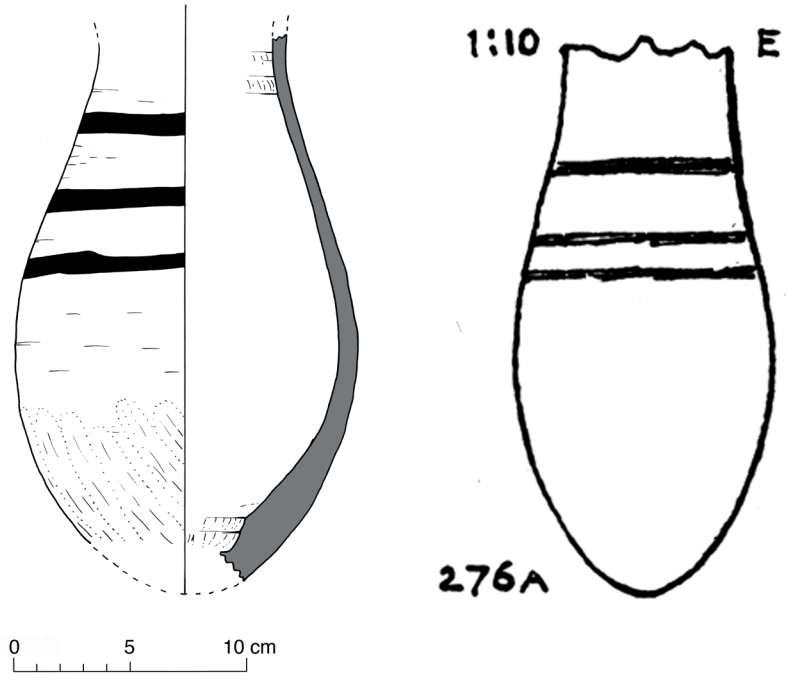

Fig. 2: The ovoid vessel from tomb 276A (0276A/GKe/005; London UC 18968). On the left the authors's drawing with visible traces of scraping. To the right the drawing after the sketch of Major Hynes (after Petrie/Brunton 1924: pl. LXIII, 276A, E).

4.5 The accuracy of the drawings

The majority of the plates bear drawings by Winifred Brunton, Hilda Petrie, and Flinders Petrie himself.[80] Those of Winifred Brunton, who also published a book with fictitious portraits of Egyptian pharaohs, are of a very good quality. Examples include copies of the decoration of some First Intermediate Period coffins, which were too fragile to be moved and therefore had to be copied *in situ* – clearly a very demanding task.[81]

A specific issue appears on plate LXIII. The drawings are said to have been done by Petrie himself and "H.G.C.H." These initials belong to Major Hynes, who had already been named as one of the team members. Most of the extremely small drawings – scales reach from 1:2 for a piece of jewellery, up to 1:30 for larger pottery vessels, and 1:80 for a coffin – on this plate derive from sketches in Major Hynes' notebook.[82] For any use of these drawings, this has to be borne in mind. Even though the sketches have proven to be quite accurate, the small scale of the drawings renders many details invisible, and given the thickness of the lines, beyond what is possible. This is especially unfortunate because there are several important objects that are not preserved today, such as the potentially only B.R.II-vessel from the excavations from tomb 267, or the only BLWm-ware vessel from tomb 273.[83]

4.5.1 Pottery and stone vessels

The published pottery and stone vessels were mainly drawn by Flinders Petrie and Winifred Brunton. Most drawings proved to be quite accurate in terms of shape and size when the actual objects could be checked against the drawings, something already observed for the earlier work of Petrie.[84] Nonetheless, the drawings have some major shortcomings that need to be addressed. In general, these are related to absent details that are standard today. The drawings mostly just give the shape of the outside of the vessel. Variations on the inside are not given (Fig. 1). Also, grooves from turning the pots or other details that reveal information now known to be of chronological or technological importance are missing. One example is the change of finishing methods, especially of the bases of ovoid jars; until the Second Intermediate Period, and sometimes in the early 18th Dynasty, they were finished by being scraped freehand with a knife, while later they were returned to the wheel and trimmed while rotating[85] (Fig. 2). Sometimes the colours of the decoration and/or the general surface colour are not given, the importance of

80 On most plates, the draughtsperson is mentioned in the right-hand corner on the bottom of the page. F.P. stands for Flinders Petrie, H.P. for Hilda Petrie, and W.M.B. for Winifred Brunton.

81 Petrie/Brunton 1924: 5 and pls. XVIII–XIXA. Other examples of very detailed and high-quality object drawings can be found on plate XLII.

82 This is explicitly stated in Petrie/Brunton 1924: 26. Petrie ibid. also mentions that he was "*laid up*" for a week or two during the excavation, which made it obviously impossible for him to do the drawings himself.

83 0267/GKeA/002 (Franzmeier 2017: 1042) and 0273/GKeA/002 (Franzmeier 2017: 1070).

84 Personal communication, Valentina Gasperini 20.01.2020. Her observations are based on her reassessment of the "burnt groups" from Gurob (Gasperini 2018), which were published by Petrie in 1891 (Petrie 1891). The biggest problems in the Sedment volumes in this regard relate to the use of sketches from notebooks and the small scales up to 1:30 used for publication, as mentioned above.

85 See Bourriau/Schenck 2015: 182 for the description of the example from Sedment, tomb 276a with general comments. For the tomb, see also Franzmeier 2017: 1092–1102.

which can be gathered from the highly unusual vessel 0132/GKe/021 shown in Fig. 3.[86] Last but not least, in several cases, only drawings of a particular type remain. The type might have been found in several tombs, but potential individual variation cannot be captured any more, unless a particular vessel is preserved and identifiable in a museum.[87]

4.5.2 Inscriptions

Most epigraphic material from Sedment was published in a relatively high quality; the drawings of architectural pieces and stelae have proven to be mostly flawless. Nonetheless, some smaller problems remain, related once more to information supplied by the non-Egyptologists, such as Major Hynes. Examples include the already mentioned inscription on a shabti, which was assembled by Major Hynes out of two different variants of the same name, and an upside-down copy of a hieratic inscription on a Canaanite jar.[88]

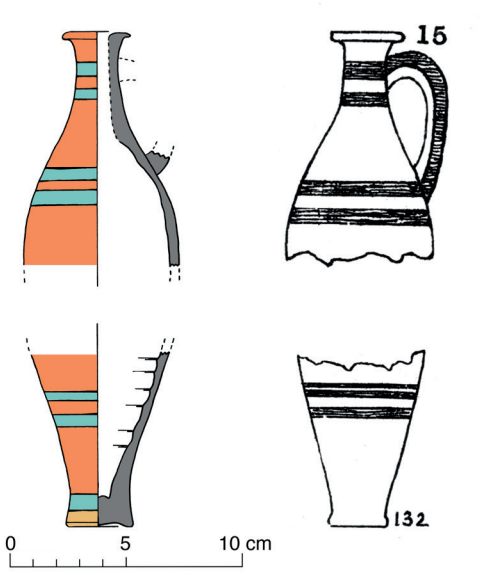

Fig. 3: The blue painted imitation of a Cypriote spindle bottle from tomb 132 (0132/GKe/021; Oxford Ashmolean Museum AN 1921.1440A). On the left the authors's drawing. To the right the drawing by Flinders Petrie (after Petrie/Brunton 1924: pl. LIX, 15).

4.5.3 Small finds

After pottery, the majority of the published finds can be assigned to the group of small finds. The drawings can be divided into two groups: line drawings and more complex shaded drawings. The vast majority of objects were published as simple line drawings. Of the New Kingdom finds, only three are known from shaded drawings of Winifred Brunton.[89] The choice seems quite random: while the cosmetic vessel from tomb 2010 is an exceptional object, the kohl-tube with a monkey, and especially the shabti from tomb 1374, can be called remarkable, but not outstanding for their quality. The quality of other objects, even some left completely unpublished, would have justified a more complex drawing. Nonetheless, where present, the drawings are of high value today, because objects, such as the shabti from tomb 1374, have deteriorated over time (Fig. 4).

86 The designation 0132/GKe/021 refers to the object number in Franzmeier 2017 (tomb 132/pottery vessel – "Gefäß Keramik"/running number within object group and tomb group). Petrie/Brunton 1924: pl. LIX, 15. The highly unusual vessel has a blue decoration on a red slip. Moreover, a yellow band near the base is completely missing, which is especially regrettable because yellow is a rarely used colour on vessels. In the text (Petrie/Brunton 1924: 25), the vessels are called "*foreign*".

87 These variations might have been significant, as is suggested by the comparison of sketches on tomb cards and notebooks of vessels said to be of the same type. See Franzmeier 2017: 66 with Fig. 3.9.

88 Petrie/Brunton 1924: pl. LXVI, 16. For the correct inscription see Franzmeier 2017: 77.

89 Petrie/Brunton 1924: pl. XLII, 4, 5, and 10.

4.6 Plans and tomb numbers

Petrie differentiated 16 separate cemeteries on the ridge between the Fayum and the Nile valley south of the modern village of Sedment. Plans were published of each of them.[90]

Plans of a couple of concentrations of tombs, where only general locations are known from the descriptions and/or the general map on plate LXXXV, are missing. These are "group 2100"[91], the tombs east of cemetery K[92], the area between cemeteries B, C, and E[93], and some rather isolated tombs, such as 2200 and 2253, which are most likely located east of group 2100[94]. All published plans were printed either in a scale of 1:800 or 1:900. This does not leave a lot of room for details, and all tombs are normally only represented by black rectangles, indicating the tomb shaft. In the case of cemetery W, the chambers and staircases of the mostly Early Dynastic Tombs are also indicated.[95] No further archaeological features, for instance the remains of superstructures, are indicated, most likely because they were badly preserved and neither excavated nor recorded.[96]

Fig. 4: The shabti 1374/U/001 (Sunderland, Tyne & Wear Museums 2006.214) from tomb 1374. On the left, the drawing by Winifred Brunton (after Petrie/Brunton 1924: pl. XLII, 4). To the right a photography of the object in its deteriorated condition (author's photo; courtesy of the Tyne & Wear Museums).

The published maps contain more than 2,500 features in total, while the highest tomb number is 2253. Numbers were assigned in sequences, and often the numbering in a certain cemetery starts with xx01. Cemetery C, for instance, starts with 101, while D starts with 401. For other cemeteries, more than one sequence was used. Tombs in cemetery B, for instance, bear a number either between 56 and 60 or 201+. For the largest, cemetery G, several sequences were used – amongst them 280-312 and 1501-1891.

Though this should have prevented the double assignment of the same numbers to different tombs, there are several cases of numbers used twice or even thrice, both in one cemetery and in more than one. For instance, there is a tomb 280 in both cemetery A and G, while a grave numbered

90 Petrie/Brunton 1924: pls. LXXXV–XC, and XXXIVA (cemetery N).

91 Located north of cemetery E and northwest of cemetery B on the plan, Petrie/Brunton 1924: pl. LXXXV. Brunton in Petrie/Brunton 1924: 9–14. Also, see Franzmeier 2017: 291–293.

92 Franzmeier 2017: 293–295.

93 Franzmeier 2017: 295–297.

94 Franzmeier 2017: 1677–1688.

95 Petrie/Brunton 1924: pl. XC.

96 Franzmeier 2017: 307–309.

398 is to be found three times in cemetery G. In cases where the tomb card or notebook entry does not reveal any useful notes or at least the cemetery, this can lead to an uncertainty regarding the tomb's position. It must be noted that the problem also relates to the mention of tomb numbers on plates, as it cannot be ruled out that objects with the same tomb number have in fact their origin in different tombs. Moreover, it needs to be mentioned that no case is known where more than one tomb card or notebook entry exists for the same tomb number. Therefore, some problems relating to double numbering cannot be solved anymore.

Another issue regarding the plans is that the majority of the marked features does not have a number; and furthermore, by far, not all tombs known from the notebooks and tomb cards have numbers either. A couple of tombs thus cannot be assigned to an exact position, and others cannot even be related to any cemetery. In some cases, a guess can at least be made if the tomb number belongs to a sequence known to have been used in a particular cemetery, but even this is not always the case. Last but not least, there is the extreme example of museum objects that can be assigned to tombs via the distribution lists or object marks and for which neither any notes nor a mark on a plan survives. In some of these cases, the existence of the tombs can even be doubted, because in 1921 finds from the earlier season at Gurob were also distributed to museums, and it has to at least be checked whether a find might originate there.[97]

4.7 The plates and their order

Petrie explicitly stressed the importance of the plates over the text. He identified several criteria by which the plates should be organised, the most important being chronology. Indeed, the Sedment volumes plates roughly follow a chronological order, with pre-New Kingdom objects being restricted to plates I–XLVII in volume I.[98] But amongst these, there are a couple of New Kingdom finds scattered over several plates. These finds were not misplaced due to incorrect dating, but are correctly identified as pertaining to the New Kingdom. Examples include tomb group 310 on plate V, tomb groups 1204, 1215, 1216, 1358, and 1373 on plate VI, hardly allocable pieces of jewellery on plate XIII, or headrests on plate XV. Though the headrests form part of a chronological presentation of headrests as a particular object group, most other objects do not relate to neighbouring objects at all. For example, amongst the headrests on plate XV, fragments of openwork mummy boards and two stone vessels from tomb 33 are also shown. As a headrest from tomb 33 is not even shown, the explanation that they were putting together tomb groups is not possible. Also, the presentation of the inventory of neighbouring tombs is not intended here, because the finds can be identified as coming from different cemeteries. However, in the case of plates XLII–XLVII this seems to have been the underlying principle: finds spanning Dynasties 17–19 from the cemeteries around the modern village of Mayana are shown, complemented by a tomb register of the respective tombs.[99]

97 Typically, in distribution lists and on the objects, finds from Gurob bear the prefix "Gh" before the number, while finds from Sedment were marked "21/xxx". For the excavations at Gurob, see Brunton/Engelbach 1927.

98 All following plate and page numbers refer to Petrie/Brunton 1924.

99 Plate XLVII also contains an image of a coffin from tomb 276a (cemetery A) and a Bes vessel from tomb 406 (cemetery D) in the northern part of the examined area, some 2–4 km north of the find spots of the other objects presented.

Another somewhat confusing matter is the plans of cemeteries. While most are to be found at the end of volume II on plates LXXXV–XC, the plan of cemetery N can be found on plate XXXIVA.

This quite critical assessment requires a little qualification: the tomb registers on plates XLVI–XLVII, and LXVII, complemented by a "list of graves with objects figured" on plate LXXIX, give the plate numbers of all objects from the respective tombs that are pictured.

Moreover, there is, contrary to Petrie's correct statement regarding the importance of a good numbering of objects on plates, a couple of objects with a missing number. This especially relates to tomb numbers on the plates with the pottery vessel types. On plate XXIX, for instance, at least three types are missing their tomb numbers.[100] If interested in these types, one has to search the tomb registers for contexts with these vessel types. As only one of the three types, type 32b, is mentioned in the tomb register for tomb 1900[101], no contexts can be reconstructed for the other two types from the publication.[102]

In conclusion, the plates leave the impression of a less than perfect planning process for putting them together. While some confusing aspects might be explained by economic constraints (e.g. the strict separation of plates with line drawings and photographs), other plates leave the impression of a rather random compilation of objects, which might have been forgotten at other points. Sometimes, no ordering criteria can be determined.[103]

4.8 Terminology and the effects of non-Egyptologists working on site

As mentioned above, some of the team-members were neither trained in Egyptology nor possessed previous practical experience in (Egyptian) archaeology.[104] This is especially problematical for epigraphy and the mention of inscriptions on objects. One very striking example are the already mentioned, fused inscriptions on shabtis. Moreover, royal names were more than once confused on tomb cards.[105] Further examples relate to the mention of "foreign" pottery in several tombs, a notion that has been proven to be wrong in several instances.[106]

4.9 Conclusions

The very fast work at Sedment in 1920/21 is visible in the publication that appeared about three years later, because several shortcomings from the documentation were transferred into the book. They account for the "*defects*" that Petrie himself was aware of regarding his publication strategy. Moreover, some of Petrie`s ideas, such as the primacy of plates over texts, are clearly visible. But the publication also shows inconsistencies and dif-

100 Petrie/Brunton 1924: Pl. XXIX, 32b, 33h, and 33p.

101 Petrie/Brunton 1924: Pl. XXXIX.

102 The types might be mentioned on tomb cards, even though this is far from certain. As this relates to finds of the First Intermediate Period, the present author has not tried to identify the provenance of the types not identifiable in the publication.

103 For a complete list of concordance of all New Kingdom objects on the plates with tomb numbers and the inventory numbers of museums (if present and known), see Franzmeier 2017: 495–512.

104 Strictly speaking, Petrie himself also had no formal training in Egyptology, but he had a lot of practical experience – almost 40 years when he arrived at Sedment.

105 Franzmeier 2017: 58. Here the names of Amenhotep III and Thutmosis III were exchanged.

106 See the already mentioned case of tomb 245.

ferences to what could be expected from Petrie's considerations. One major issue is the lack of published post-New Kingdom materials. This is even more astonishing because the history of the Heracleopolitan region in the Third Intermediate Period is of high interest, something even mentioned by Petrie himself, who complains about the lack of such finds.[107] Why the supposed finds from the 22nd dynasty were not published remains unclear. Aesthetic perceptions might have played a role; the above-mentioned pottery coffins, for instance, are indeed often very simple. This might go hand-in-hand with Petrie's funding, because most of the objects published were also those taken to England to be sold and shipped to various donors and museums all around the world.[108] Only very few of the objects left on site were published. Another inconsistency regarding the importance of the finds is the publication of plenty of 18th Dynasty material in contrast to 19th Dynasty material, especially in the light of Petrie's above-mentioned 1904 remark concerning the "well known" 18th Dynasty. Finally, there seems to have been some kind of disorganisation and an overwhelming amount of finds, which in combination with the restricted resources, led to an overall defectiveness, which Petrie from the beginning of his career openly admitted, and which seems to have been caused by chance. The above mentioned plate LXIII, where drawings of objects were taken from the notebooks of Major Hynes, might serve as evidence for this. In most cases, all objects left un-sketched by Major Hynes were not published at all, even though there were important finds, such as a faience vessel and a painted pilgrim flask from tomb 245.[109] Moreover, this randomness becomes apparent in the above-mentioned publication of plans of tombs, which are not mentioned at all anywhere else in the text. Besides general maladministration, this haphazardness might also be partially explained by Petrie's frequent periods of illness, which also confined him to bed for one or two weeks in Sedment.[110]

In addition to the factors mentioned above, one anecdote from Petrie's autobiography sheds some light on the circumstances in which he worked on his publications: "*By November 9 I started to Liverpool for the long-sea way, and at Malta visited Hagiar Kim. The writing up of Tanis I was done during the voyage, with Greville Chester as fellow passenger. On December 1, 1884, I went down to the great Greek site and looked round for accommodation.*"[111] This means that the account of his 1883–4 work at Tanis was written up within a few weeks aboard a ship far afield from any library. Of course, he might have done research before and also later, but it remains a pretty brief period to write up a book. This way of working might have also had an influence on the problems observed in the Sedment volumes. Finally, Petrie seems not to have seen his excavation reports as books containing final analyses;

107 Petrie/Brunton 1924: 1: "*But, strange to say, little was found of the XXIInd and XXIIIrd dynasties, although this city and its priesthoods often appear among the titles of the royal family in this period.*"

108 Franzmeier 2016b: 106–107 with further bibliographic references. See also Sowada 1996: 91 for some statements regarding the wishes of the donors.

109 0245/GFa/001 and 0245/GKe/001; see Franzmeier 2017: 910–911. In most cases, Major Hynes' notebook contained only sketches of complete objects. Therefore, any broken or fragmentary find is very unlikely to have been published.

110 Petrie/Brunton 1924: 26. For further accounts of frequent illnesses, see Drower 1995: 75, 199.

111 Petrie 1932: 56. One has to take into account though, that it is Petrie's autobiography, written almost 50 years after the events described. While he might have referred to his diaries (see Del Vesco 2013) for the dates and certain events, the descriptions might have been influenced by time and Petrie's own view of himself.

moreover, as specified in the quotation already given above in paragraph 2, he saw them as "*sources of facts and references on their subject*", lasting for decades or even centuries.[112]

5 The Sedment volumes compared to contemporary works

To interpret and assess the dataset, the excavation first needs to be placed within the broad range of Petrie's work. It was only Petrie's second project after WWI and there is evidence that the site was chosen exactly for the expectation of rich finds.[113] Moreover, Petrie, at age 67, was clearly at a very late stage in his career.[114] His techniques, once considered to be leading within the field, had not changed much, as already noticed by other Egyptologists of the time. In 1907, more than a decade prior to the excavations at Sedment, Petrie had been harshly criticised by Norman de Garis Davies in a letter to Francis Griffith, while in 1928, his field methods were judged as "*long since passé*" by James Henry Breasted.[115] This article cannot be the place to follow this criticism in detail, and compare Petrie's publications with all contemporary works, but a quick survey already reveals that by the time the Sedment volumes were published, they no longer represented good practice.

The publication of the cemeteries of Aniba by Steindorff might serve as an example.[116] While the much longer text (more than 250 pages just in volume I) might be explained by the fact that the preparation of parts of the publication took more than 20 years, the manner of presentation, and the much larger number of *in situ* photos and drawings, already point to a much better documentation on site, including the non-presence of laymen.[117] Moreover, the volumes are much better organised, with clear chapters dividing different cemeteries and particular topics, such as tomb architecture and groups of finds like coffins. As a non-German excavation, showing the international spread of standards within Egyptological archaeology, George Andrew Reisner's work at Naga ed-Dêr might serve as an example.[118] Even though conducted almost two decades before the excavations at Sedment, and published sixteen years earlier, this publication also contains much more detail; this is not just related to a more lavish mode of publication, but also to higher standards of documentation, especially regarding photography and the descriptions of archaeological contexts *in-situ*.[119] The maps also contain many more details regarding the tombs, and include even general sections with the stratigraphy, something entirely missing at Sedment.[120] This mode of documentation and publication is distinctly different from Petrie's work. Reisner states: "*It is necessary to make a complete record by drawings, notes and photographs, of every stage of the work. We have*

112 Petrie 1932: 112. I owe this idea to Thomas Gertzen.

113 Franzmeier 2017: 22.

114 For an assessment of this stage in Petrie's career, see Drower 1995: 348.

115 Thompson 2015: 283.

116 Steindorff 1935 and Steindorff 1937. For a reassessment of the ceramic material, including a chapter on the excavation and the documentation used, see Helmbold-Doyé/Seiler 2019. Even though far from perfect, the standards of the documentation can also be judged as being far superior to the one used by Petrie and his team in Sedment 1920/21. I am grateful to Jana Helmbold-Doyé for providing me with a copy of the chapter on the history of the excavation.

117 For the team, see Steindorff 1935: 20–21.

118 Reisner 1908.

119 Plates 10–30 show *in situ* photographs of tomb contexts.

120 Reisner 1908: Pl. 78.

found it possible to record every tomb in a cemetery, plundered and unplundered, by photography, and, moreover, every important stage in the excavation of each tomb."[121] Regarding the publication, he refers implicitly to Petrie, saying: "*It is necessary to publish these records so far as practicable, tomb by tomb, and at the same time to give a careful systematized consideration of the material they contain. The hasty and incomplete publication, year by year, of the season's work, with the temporary working hypothesis of the hour, satisfies the curiosity of those who have a less direct interest in the work, but tends to deprive the systematic archaeologist of a large mass of useful material.*"

It has to be stated though, that in both cases mentioned, the funding situation was much better. Steindorff and Reisner most likely had a much larger budget, which was not dependent on the sale of antiquities to a large number of donors. Reisner explicitly mentions his antipathy towards the "search for museum specimens" which is so important for Petrie's work due to his funding model: "*The discovery of beautiful objects is, of course, greatly to be desired; but the search for Museum specimens is an offence against historical and archaeological research which is utterly unworthy of any institution which pretends to be devoted to the advancement of knowledge.*"

In both cases, the funding was mainly given by one source, and it can be guessed that it was better than Petrie's. Therefore, one could ask the question of how Petrie would have dealt with much better and secure funding, and whether he would have followed the examples of others. While the lavish way that the Aniba volumes were published might have been considered unnecessary luxury by Petrie, the better documentation and subsequent publication of archaeological contexts would have been something Petrie could hardly have argued against from an archaeologist's standpoint, even if he would have kept his publications rather brief. But all of this, of course, remains speculative.

In the middle, between Reisner's approach of publishing the results of an excavation at length and Petrie's brief reports, classicist John Percival Droop's 1915 book "*Archaeological Excavation*" declares: "*A possible exception comes in the case of a cemetery, for the contents of a tomb are one fact not to be separated either in a museum or in a publication; but as nothing is more dreary than a long catalogue of the contents of mediocre tombs, the excavator should exercise a strict censorship over these facts and be very sure that each is of interest before he lets it see the light.*"[122] Thus, he argues for briefness of publication, but also for keeping the contents of an archaeological context together. Moreover, he states: "*For my labour has been vain if I have not made it clear that to do his work properly the excavator must note down all possible observations whether their interest is apparent at the time or not; many of these, probably the greater number, will in the end prove valueless, and it would be like giving a thirsty man salt water to drink to serve them up to a public hungry for knowledge.*"[123] This is once more a clear plea for sound documentation, which at Sedment was definitely not produced for a huge amount of tombs. The effects for modern research are clearly visible, because certain data, such as the number of persons buried in a particular tomb, is often missing.

Nonetheless, Petrie cannot be totally condemned, as is shown by a contemporary review of the Sedment volumes in the 1925 volume of the *Jorunal of Egyptian Archaeology*.[124]

121 This, and the two following quotes, from Reisner 1908: VIII.

122 Droop 1915: 60.

123 Droop 1915: 58.

124 Hall 1925.

While generally favourable, the criticism takes a surprising turn, stating that "*We do not quite see the use of the elaborate and painstaking plans of cemeteries, Pls. LXXXVII–XC, especially Pl. LXXXIX. Is anything to be learnt from them that can compensate for the time spent in their preparation? One could surely say in print merely that in most of the cemeteries most of the graves were oriented in the same direction, but that in Cemetery G (Pl. LXXXIX) there were considerable variations, many of the graves being placed at haphazard*".[125] From the viewpoint of today, this conclusion must be called a complete misjudgement, maybe related to Henry Reginald Hall's background as a classicist.[126] If these plans were missing, today no maps of the cemeteries of Sedment would survive, as to the author's knowledge the surviving documentation contains no more than sketches of single tombs. Any spatial information beyond the knowledge of the differentiation of certain cemeteries would be missing. No notions of a horizontal stratigraphy, the development of cemeteries, or the orientation of tombs in whole cemeteries would be preserved.

This example might serve as a reminder that even if Petrie's work – especially towards the end of his career – seems to be remote from modern standards, and even from the standards of his contemporaries, it was actually better than what others produced or might have produced. Information, which today is deemed very important, was included in the publication, even though it was not used by Petrie in his discussion of the excavations' results.

6 Petrie's Excavation Reports Today: Problems and Perspectives

As described above, Petrie's approach, as well as the translation of it into the reality of publications, was very different from that of most modern excavators. Today, often very specific topics are presented *in extenso* in separate volumes, especially, but not only, in German Egyptology. The aim of such publications was probably best summarized by Edgar B. Pusch: „*Vorzulegen, was wir haben – in Wort und Bild – um dem Leser die Möglichkeit zu geben, jederzeit nachzuprüfen, was wir folgerten und darüber hinaus für ihn die Grundlagen zu schaffen, auf denen er seine eigenen Überlegungen aufbauen kann.* […] *Aus demselben Grund legen wir die hohen Quantitäten auch kleiner und kleinster Stücke vor, zeigte es sich doch, daß selbst solche „Krümel" Merkmale tragen können, die im Gesamtbild einen neuen Blickwinkel ermöglichen.*"[127] This approach is very transparent and helpful for anybody working on a specific subject, such as glass production, as the volume the quotation above comes from is concerned with. It makes sure that every future loss of excavation documentation, and even objects, will not be as regrettable as it is in the case of Petrie's excavations. But it can sometimes go hand-in-hand with missing general publications, providing an overview of a given project's major results as a whole.

125 Hall 1925: 116.

126 Thompson 2018: 382 writes: "*To some extent he remained a classicist at heart all his life*". Moreover, he is classified as a "historian" by Thompson. This might have influenced his judgment even though he had gained fieldwork experience in Egypt. On the other hand, Droop, whose work was cited above, was also a classicist by training, and therefore also individual, personal sentiments and ideas might have played a role.

127 Pusch/Rehren 2007: 10. For the outline of an ideal publication of excavation results using modern technologies beyond books, even including raw data, see Marchetti/Angelini/Artioli/Benati/Bitelli/Curci/Marfia/Roccetti 2018.

Authors, especially excavators, seem to back off from addressing the "big questions". One of the major reasons is almost certainly the much higher complexity of modern archaeological projects, with so many different specialists involved, and with so many more publications in the field of archaeology and Egyptology.

But what do the results of this brief study mean for the use of Petrie's books in particular and contemporary publications of early excavations in general? As a matter of fact, they will still remain the irreplaceable references for many sites that were extensively excavated in the late 19th and early 20th centuries, as was anticipated by Petrie himself. But as the author has already argued elsewhere, a thorough criticism of the publication is necessary alongside the use of remaining field documentation and the actual finds to the greatest extent possible. Otherwise, all results will remain flawed by an incomplete dataset or problems, for instance regarding the terminology[128]. Moreover, an explicit reflection on the dataset and the conditions and premises under which the archaeological fieldwork was conducted needs to be included in any reassessment of such old excavations.

One of the major obstacles to this strategy, involving the closest possible (re-)assessment of finds from an excavation, is the distribution of objects.[129] Finds were scattered all over the world, not just from one site, but also from parts of one site, and even finds from the same context.[130]

Moreover, some information has to be regarded as lost forever. For Sedment, this holds true particularly for archaeological contexts of the later New Kingdom, as well as all later periods.[131] The assessment of some multi-phased and/or disturbed burials is very difficult, and any conclusion, especially regarding chronological issues, has to be verbalised with reservations. An example is tomb 246, where a faience ring bezel gives the name of Horemheb. All other finds from the tomb correlate with an earlier 18th Dynasty date, proven by radiocarbon dating.[132] As neither in the publication nor the existing documentation positions for individual finds are given, it cannot be excluded that the ring bezel does not even indicate a second phase of the tomb, but might have been found, for example, in the filling of the shaft of this disturbed tomb.[133] All of this leaves place for speculation and educated guessing without hard evidence. Insuperable problems will most likely limit the informative value of Petrie's, and others', early excavations, even though great potentials lie in the huge number of unpublished finds, which have survived in various museums all around the globe.

128 For a case of the uncritical use of published data from old excavations see Goulding 2013 and the corresponding review Franzmeier 2016a.

129 See Stevenson 2019 for an excellent overview of the various aspects and mechanisms of the distribution of finds from Petrie's and other contemporary Egyptologist's excavations.

130 Objects from tomb 134 at Sedment are today to be found in at least 18 museums in seven countries on four continents. Franzmeier 2016b: 109.

131 Franzmeier 2016b: 112–116.

132 Franzmeier/Höflmayer/Kutschera/Wild 2011: 22–25.

133 Franzmeier 2017: 913–920.

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Bone and Ivory Carvings Dating Between the Roman and Early Islamic Period Preserved in the Museo Egizio in Turin. An Interdisciplinary Approach

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Object of this study is an unpublished corpus of 193 bone and ivory objects dating between the Roman and early Islamic periods, preserved in the Museo Egizio. Most of the finds come from Evaristo Breccia's excavation at Ashmunein (1903–1904); moreover, there are objects bought by Ernesto Schiaparelli in Egypt at the beginning of the 20th century. In an attempt to obtain as much information as possible from these materials, an interdisciplinary approach has been adopted along with the traditional typological-stylistic analysis.

We attempted a reconstruction of the excavation context about which only short reports are known. We also made a typological, iconographic and stylistic analysis aimed at the cultural contextualization of the objects and their iconographic comparison. A physical analysis of the material was conducted with the intention to reconstruct the craftsmen's *modus operandi*, to identify the type of material (bone or ivory) and the selection criteria, according to the shape of the objects.

The comparison between the objects found in the area of the excavations in Ashmunein, in particular the figurative ones, and the materials from sites recently investigated with modern methods, have allowed to remedy the shortage of data regarding the context where these objects were found and to reconstruct the stratigraphic phases of the site. The site was a habitation quarter with levels from the Hellenistic, Roman and Byzantine period: a stratigraphy therefore similar to the one found in some sites in Alexandria, which have returned materials of the same kind.

Therefore, the approach adopted for these "forgotten" materials allowed to broaden our knowledge about the methods of processing objects and their context of discovery.

1 The Italian Excavations in Ashmunein-Hermopolis Magna (1903–1904)

> "Personificato da un ibis, [Thot, a cui era sacra Ashmunein] era nientemeno che il creatore, Dio lo perdoni, del mondo, della scrittura – schema scheletrico d'una follia suprema che un uomo triste fa d'un bimbo lieto – e della scienza."
> Breccia 1957: 107

My colleague Cristina Ghiringhello examined in her study about 193 bone and ivory objects coming mostly from the excavations which Evaristo Breccia led in Ashmunein between 1903 and 1904 on behalf of the Missione Archeologica Italiana (M.A.I., Italian Archaeological Mission). Many items bought by Ernesto Schiaparelli in the antiquities market at the beginning of 20th century can be added to the lot of bone and ivory carvings coming from this first Italian campaign. The objects kept in the Museo Egizio also include a small amount

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of ivory and bone examples coming from the excavations of Francesco Ballerini and Ernesto Schiaparelli in Hammamiya and in the Valley of the Queens, such as tools, ornaments and semi-finished products. I am going to deal with the objects coming from Ashmunein and, particularly, from Breccia's work there.[1]

The study of the finds from the Italian campaign in 1903–1904 reveals that we have no exact data about the excavated places in the site and the context where the objects were discovered. From the available scanty information, it appears that the excavations involved a multilayered settlement with evidence from Hellenistic, Roman and Byzantine eras.[2] Breccia worked in Ashmunein from February 11th to March 10th 1903 (Fig. 1). After him, the works continued with Ballerini probably until the end of April. In the same years, Breccia was tasked by Schiaparelli with digging in the Giza necropolis where he probably worked from March to April 1903. The Italian archaeologists shared their concession in Ashmunein with the German Archaeological Mission. The separation line between the two missions divided the town into two sections, starting from the top of the *kôm* and going towards the East. Breccia himself had undertaken work in this area in search of papyri.[3] In the *kôm*, he found some small Coptic and Roman objects, in addition to many papyri fragments dating back to Domitian, Trajan and Vespasian, concerning accounting and administration in this part of the Roman province. He discovered a number of bronze coins, too, the oldest one dating back to Arcadius (377–408 AD).[4]

Breccia undertook a second campaign in Ashmunein during the months of February–March 1904, but in the meantime he was appointed as a director of the Graeco-Roman museum in Alexandria, so he left the site. Giacomo Biondi continued the excavations on the site during the month of May 1904, focusing his work in the area of the Kôm Qassum.[5] This place name designates two debris hills derived from the crumbling of the raw brick walls and from the rubbish stockpile; the *kôm* lay in the north-west area of the town (Figs. 2–3).

The excavations started again in 1908–1909 under the direction of Schiaparelli from March 3rd to April 10th. In this last occasion, the Italian Mission found Greek papyri and architectural fragments, which were placed in a temporary deposit in Luxor and then sent to Turin.

The site of the ancient Egyptian city of Khemenu, later the Graeco-Roman Hermopolis Magna, has long been known; it is situated on the west bank of the Nile in Middle Egypt, approximately 40 km south of Minia and 7 km north of Mallawi. The ancient written sources speak of a harbour of Hermopolis which is not visible any more because of the repositioning of the river bed.[6]

The modern name of the first and larger of the two villages composing the site derives from the ancient Egyptian name of the city, transmitted from the original Khemenu through the Coptic Shmoun to the Arabic Ashmunein. The latter, much smaller, village at the northern end of the site bears the name Idara, but at the time of the

1 For a profile of Evaristo Breccia, see Bresciani et al. 200, and, for his activity in Egypt, Donadoni 1982.

2 Breccia 1903; 1957.

3 Breccia 1903: 463. It is not possible from Schiaparelli's documents to deduce the exact date of closing of the excavation in Giza. We know he asked Breccia to leave Ashmunein for Giza at the middle of March until the end of April 1903: Moiso 2008: 206–210.

4 Ibidem: 465.

5 Biondi 1905: 287.

6 Pensabene 1993: 244.

Fig. 1: The site of Breccia's excavations in Hermopolis (1903); slide no. B00010 (© Archivio Museo Egizio, Turin).

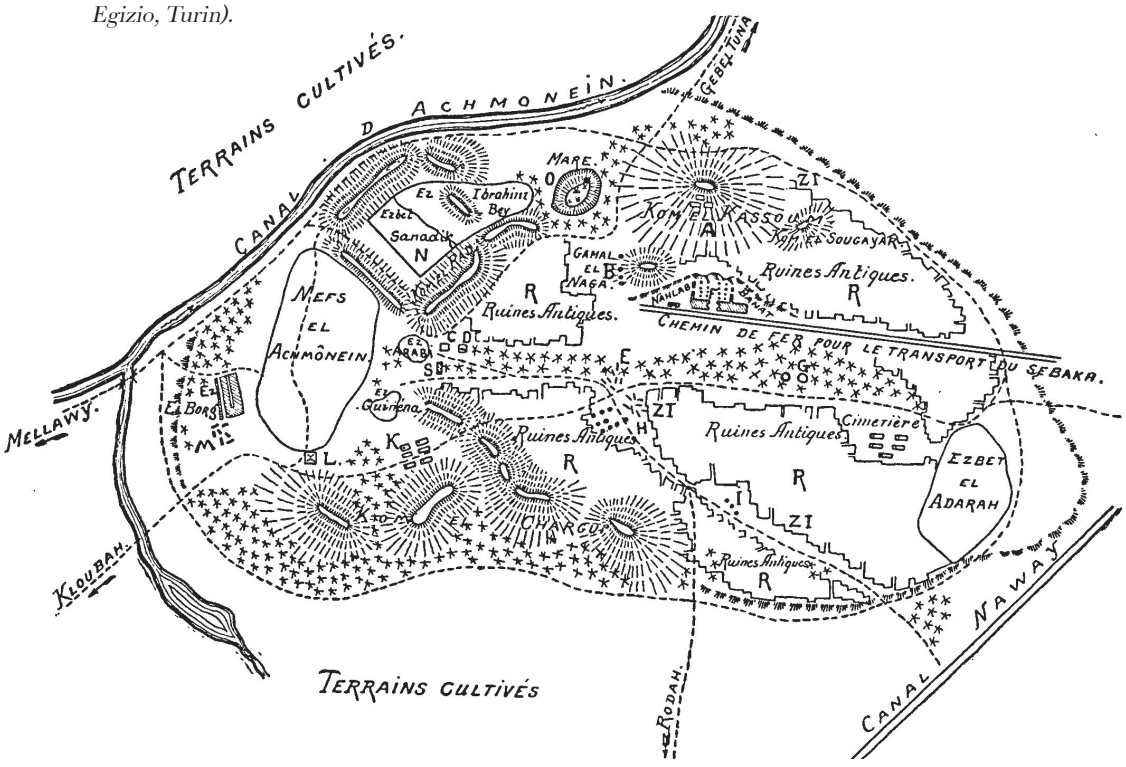

Fig. 2: The map of the site by Biondi 1905, reproduced in Chabân 1907: 213.

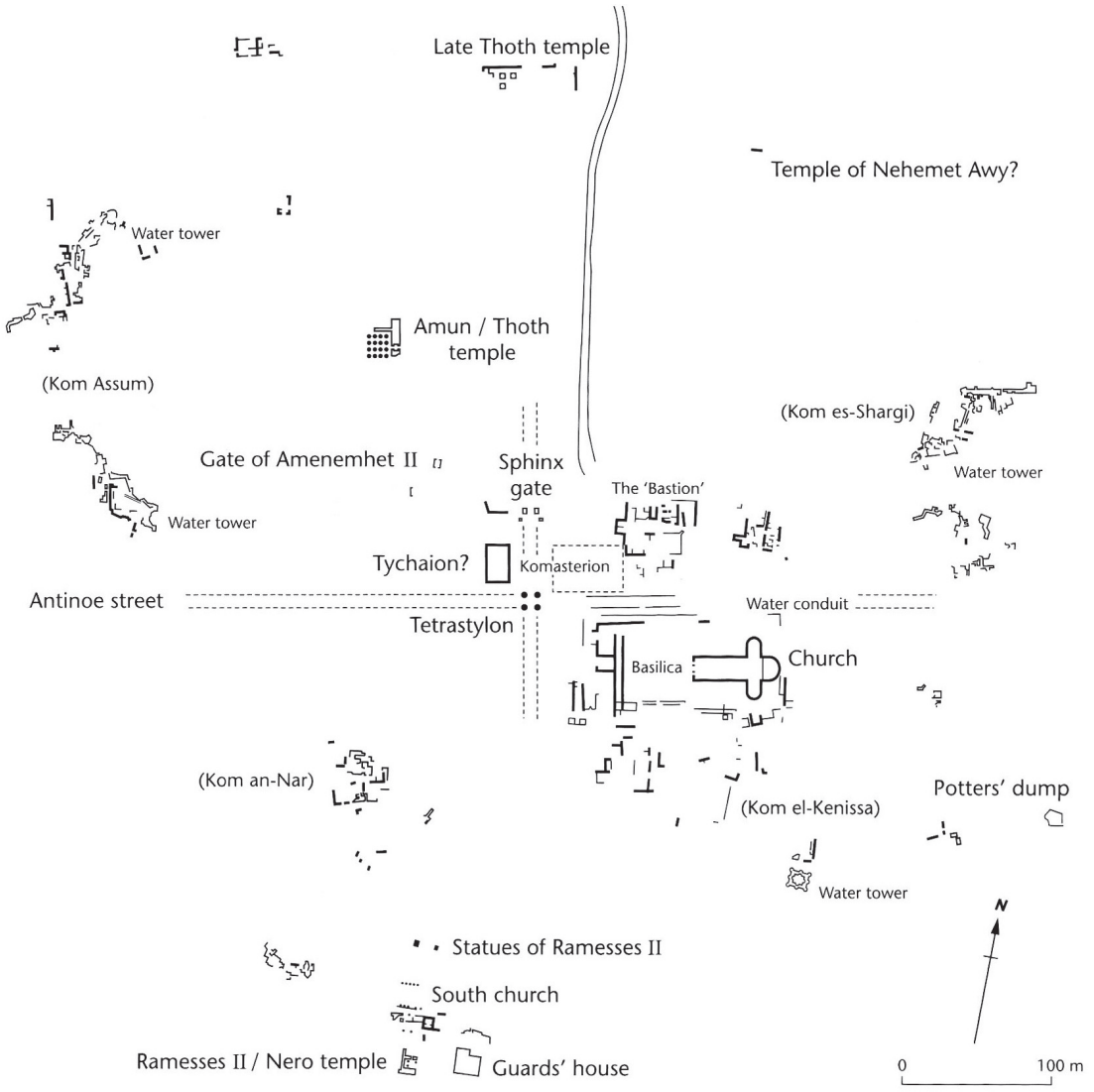

Fig. 3: The new map of the site after Spencer *1983: 163, Fig. 6.3.1.*

French Expedition in 1798 no village existed at this point.[7] The Egyptian name Khemenu means „(The Town of) the Eight (Gods)", alluding to the eight primordial creatures (four snakes and four frogs) born from the original waters of Nun.

Under the Ptolemaic rulers, Hermopolis became the capital of the 15th nome of Middle Egypt, due to its hinge position between Upper and Lower Egypt and to its river harbour. It was the cult centre of the god Thot and Philip III Arrhidaeus (323–317 BC) had a sanctuary consecrated to this god built; Thoth was assimilated by the Greeks to Hermes (Figs. 4–5). It was during the 2nd century AD that Hermopolis reached its economic and cultural peak.[8]

7 Spencer 1983: 3.

8 See the recent essay Medini 2012, with earlier preceding bibliography.

Fig. 4: The Ptolemaic temple of Thoth; slide no. C00952 (© Archivio Museo Egizio, Turin).

Fig. 5: A stela consecrated to Thoth in his temple; slide no. C00953 (© Archivio Museo Egizio, Turin).

The Greek town was built according to the Hyppodamian architectural plan. It was divided into quarters by two long and wide main streets, crossing in the middle. The secondary streets developed parallel with the main ones. Besides the main temple of Thoth, several other sanctuaries are attested: two consecrated to Serapis; one each to Augustus, Hadrian, and to Antinous, a temple to the Nile; one to Aphrodite, and another dedicated to Athena.[9]

According to Mohammed Kamal, who worked on the site of Ashmunein for several months in 1942, "*one of our most precious sources* [about Hermopolis in Ptolemaic age, M.T.] *is the P. Hermitage 127, v°* [= P. Vindob., gr. 12565, I

9 Breccia 1957: 109. For a general description of Hermopolis in the Roman period, see Bailey 1991.

fragm. Cod. 2, line 173, M.T.], *which informs us about a street running from the East to the West traversing the town from one part to the other. This document is an account made by Aurelius Appianus in which he gives a detail of the expenses necessary for the creation of a double system of porticoes running along this street which runs from the gate of the Moon (West) to the gate of the Sun (East)*".[10] Aurelius Appianus was a Roman estate owner who lived in Egypt in the middle of the 3rd century AD. He left an extensive archive of letters and documents concerning his property which can be considered as the largest single collection of papyri from Roman Egypt. It seems that the archive was discovered at the end of the 1898–1899 digging season at Kasr Harit in the Egyptian desert by Bernard Grenfell and Arthur Hunt, when workmen in their employ decided to carry on digging, and came upon a box full of papers. The archive was broken up in the early 20th century, and sold to dealers.

From the same papyrus P. Vindob., gr. 12565, we learn some important details about the several buildings in Hermopolis, both private and public (niches, fountains, tetrastyles and temples) which were erected on both sides of this main street, starting from East to West with the temple of Antinous and that of Hadrian.[11]

Kamal says in his report about the excavations in Ashmunein: "*Breccia*[12] *presumed that the granite columns which lie about or are still standing near the modern road belong to the Graeco-Roman market place, i.e. the Agora. (…) Since then the place marked by the granite columns was supposed to be the famous Agora of Hermopolis, so brilliantly illustrated and described by the papyri*".[13]

This building later revealed itself as a Christian basilica, thanks to the results of the later excavations conducted by the archaeologists of the British Museum (Fig. 6).[14]

From a letter by Breccia to Domenico Comparetti, dating to May 28th 1903, now kept at Pisa University, we learn that the first campaign to Ashmunein was carried out at a rapid pace and with satisfying results, so that the archaeologist asserts: "*I Tedeschi hanno trovato assai meno di noi*" (The Germans found much less than us).[15] The large number of workers active on the site shows that the excavation involved intensive removal of earth (Fig. 7). Breccia chose to prioritize the search for papyri and this influenced the work. Moreover, the remaining material was not the subject of a detailed analysis.[16] He himself records that, during the 1903 campaign, 200 meters to the East of Kôm Qassum had stood a hill of remarkable height, and that, after the Italian and German works, this high ground did not exist anymore (Fig. 8).

In his report to the Accademia dei Lincei in 1903, the Italian archaeologist does not give any precise information about the investigated area, so it is difficult to identify the context where the objects were found. He probably searched in a zone of the settlement where, between the 15th and 16th centuries, an Arabic community had lived.

In Kôm Qassum there were four water towers, dating back to the late Roman period, perhaps to provide the numerous houses of the city with water.[17] Breccia decided to explore these houses because he thought he could discover some intact papyri there; he had indeed learnt from his workers that many papyri from Ashmunein circulating in the antiquities market had been

10 Kamal 1946: 289.

11 Kamal 1946: 290. See also Bailey 2012: 196–198.

12 Breccia 1905: 36.

13 Kamal 1946: 292.

14 See below, fn. 22.

15 Moiso 2008: 207.

16 Ghiringhello 2008–2009: 85. See also Breccia 1936.

17 Bailey 2012: 195.

Fig. 6: The Christian basilica previously considered as the Agora; slide no. C 00957 (© Archivio Museo Egizio, Turin).

Fig. 7: Intensive excavations on the site; slide no. B 00923 (© Archivio Museo Egizio, Turin).

Fig. 8: The hill near Kôm Qassum after the excavations by the German and Italian missions; slide no. C 00959 (© Archivio Museo Egizio, Turin).

found exactly inside these dwellings.[18] The digging area appeared already disturbed by clandestine excavations, so that it was possible to find artefacts of different ages shuffled together. In addition to materials of the Coptic and Islamic epoch coming from the upper layers of the hill, some objects of Roman age came to the light, as well as Greek papyri of the 3rd century AD, ostraca, oil-lamps with human masks and sculpture fragments. Among the most valuable fragments, Breccia mentions a head of Alexander and one of Zeus Serapis.[19]

A German expedition led by Günther Roeder later carried out the regular excavation in the area of Ashmunein in the 1930ies.[20] As mentioned above, the Egyptian Antiquities Service worked there with Mohammed Kamal in 1942, especially in the town centre.[21] Since the 1980ies a British Museum mission has been working on the site, expanding our knowledge of the urban layout of Ashmunein.[22]

Marcella Trapani

18 Breccia 1905: 25, mentioned in Ghiringhello 2008–2009: 82.

19 Ghiringhello 2008–2009: 82.

20 Roeder 1959.

21 Kamal 1946: 291–295.

22 Spencer 1983; Spencer/Bailey 1982–86; Bailey 2012.

2 Bone and ivory carvings in the Museo Egizio: physical, typological and stylistic analysis

The cataloguing project of the objects kept in the Museo Egizio's deposits which was started in 2008 by the Ministero per i Beni e le Attività culturali e per il Turismo provided the occasion to conduct research on various materials and origin contexts.

Object of our study is an unpublished corpus of 193 bone and ivory objects, dating between the Roman and early Islamic period, preserved at the Museo Egizio in Turin. The batch includes different groups of artefacts (Fig. 9): objects carved in the round, appliques with figurative and vegetal reliefs, elements for the decoration of cases and furniture (tubular appliques and patches, shaped frames and strips with spiral, string and astragalus decorations), everyday objects (gaming pawns and counters, dice, hairpins, styluses, pendants, combs, cosmetic palettes, spools, spinning implements, rattles, handles, tools and knobs). A separate group consists of unfinished objects, raw material and processing waste.

Only a minimal part of these objects was displayed in the Museum, the majority of them was kept in the storage room. Today the finds are kept in the Material Culture Section of the Museo Egizio.

2.1 Research objectives

The approach adopted for the analysis of the finds has been interdisciplinary in an attempt to obtain as much information as possible. We did not stop at a typological or iconographical study, an approach that has often been reserved for this kind of material,[23] but we also analysed physical and morphological characteristics of the raw material to determine, when possible, the section of the bone or tusk used.

Since a large number of finds came from the Ashmunein excavations (1903–1904), the reconstruction of the find context of the materials has been fundamental for the research. In this regard, the archival work carried out by Marcella Trapani was very important. In fact, the examination of the archive's written and photographic documentation and the compara-tive study of the materials, aimed at reconstructing the "biography of the archaeological find", provided important information not only on the place of discovery, but also on the nature of the material itself and on the methods of production.

The study of the artefacts was carried out using a methodology that ensured efficient analysis and recording of the essential data. All the finds of the batch are accompanied by technical files, drawings and photos. Tables with graphs in

23 Regarding the bone and ivory finds from the Hellenistic, Roman and Byzantine periods found in Egypt, the publications of the early 20th century show a purely descriptive approach, often due to the lack of excavation data. These studies, in fact, favor the method of formal and stylistic analogy for dating, in terms of greater or lesser adherence to the artistic canons of Hellenistic art. Little attention is given to questions concerning the nature and sourcing of raw materials, the location of production centres and the circulation in the Mediterranean area of artefacts and raw materials; also the technological aspects, extremely important for the definition and understanding of specialized craft practices, have been scarcely considered. For the Egyptian ivories of the Hellenistic and Roman periods see Botti 1900 (the first cataloguing of the ivories and bones from Alexandria and the surrounding area); Strzygowski 1902; Strzygowski 1904; Wulff 1911; Breccia 1912; Petrie 1927.

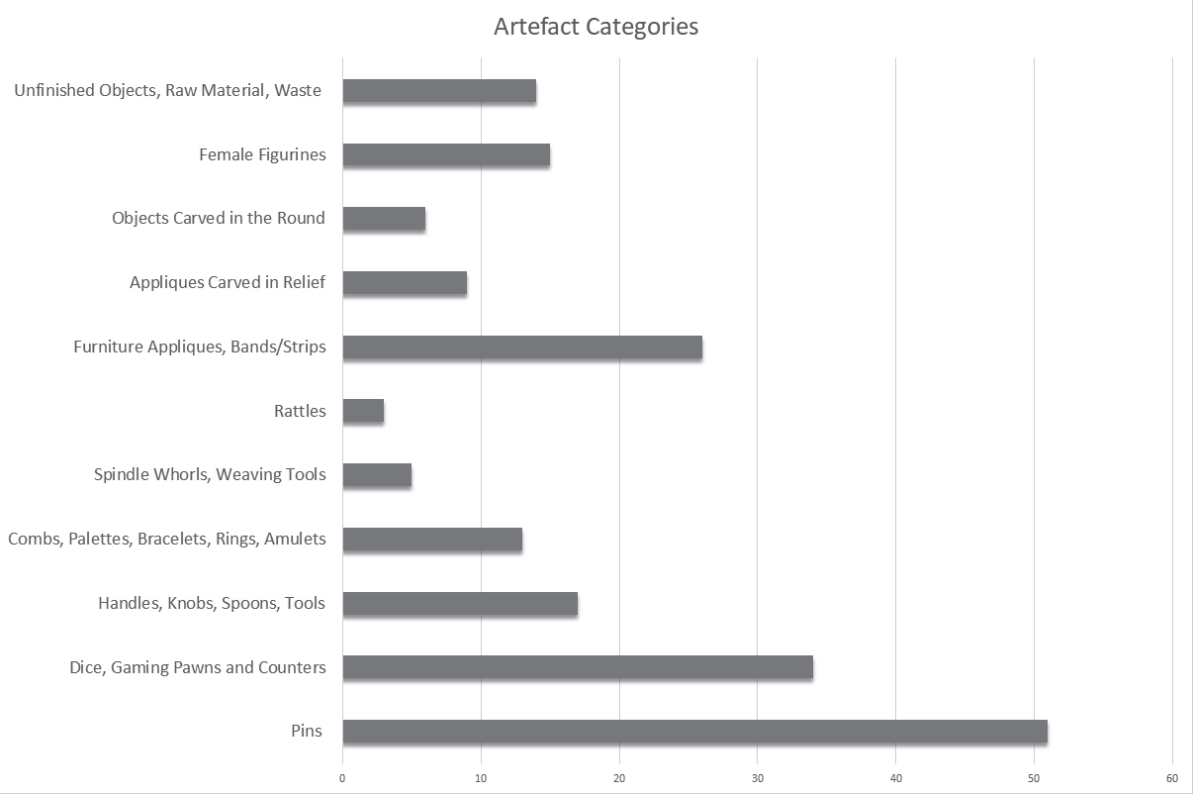

Fig. 9: Quantification of bone and ivory object groups dating between the Roman and early Islamic periods kept in the Museo Egizio, Turin.

the annexes have been developed to better visualize the categories of the artefacts. In addition, typological tables have been developed for the most numerically relevant groups of artefacts, such as furniture framings, gaming dice, hairpins and female figurines.

Each typological series was filed according to morphological, iconographic and stylistic affinities, trying to respect, when possible, the progressive order of the Inventory, which distinguishes the various acquisitions of the Museum (excavation/purchase). The comparative examination of the inventory numbers allowed us to find mistakes and duplications in the inventory numbering of the findings, making it easier, in some cases, to read correctly low visibility numbers (vanished numbers).

2.2 Reconstruction of the excavation context and chronology

The comparison between the objects found in the area involved in the Breccia excavations at Ashmunein, in particular the figurative ones, and the materials from sites excavated during the second half of the last century with stratigraphic methods, have allowed to remedy the shortage of data regarding the context and to reconstruct stratigraphically the phases of the site.

The multilayer stratigraphy of Kôm Qassum (habitation quarter with levels from the Hellenistic, Roman and Byzantine age, on which a Muslim cemetery was later established) was similar to the one found in some sites in Alexandria which have returned materials of the same kind, in particular in the Roman-

Byzantine quarter of Kôm el-Dikka[24] and in Diana's theatre area.[25] In these sites, nearby public buildings – like theatres and bath houses – and along Via Canopica (L1), many shops specialized in the processing of bone and glass (luxury craftwork) were found. These shop activities are dated, thanks to the association with ceramic material, between the 3rd and the 9th century AD, confirming the continuity of the bone carving in Alexandria until the Islamic period, particularly in the quarter of Kôm el-Dikka and near the main urban road axis; in fact, these sites had good sales opportunities.

Many objects carved in the round, appliques with figurative and vegetal reliefs, elements for the decoration of cases from Kôm Qassum to Ashmunein are very similar to those found in the Alexandrian contexts and can be dated between the 4th and the 9th century AD.[26] In particular, the unfinished plaques S. 2133 (Fig. 10) and S. 2479 are very interesting, since these show two different stages in the manufacturing process. The plaque S. 2479 (Fig. 11) shows a more advanced stage of manufacturing: it depicts a flared stem at the base, at the top of which opens a bud, perhaps of lotus. These finds are similar to appliques with floral reliefs found in the Diana area and in the site known as Lux during emergency excavations[27] in Alexandria and to some preserved in the Benaki Museum in Athens[28] dated between the 3rd and 4th century AD (Fig. 12).

Therefore, the discovery of semiprocessed bones and unfinished plaques suggests the presence of bone/ivory carving ateliers in Ashmunein, thus confirming the vitality of manufacturing of such materials in provincial areas. This activity has often been considered a prerogative only of the Alexandrian workshops.

Three bone female figurines[29] (S. 2137, S. 2139, S. 2457) dating between the 7th–9th century AD were found by Breccia in Ashmunein in the higher layers of the Kôm Qassum; perhaps these finds come from the early Islamic necropolis. The acephalous figurine S. 2457 (Fig. 13) belongs to a well-attested typology (8th century AD): the figurine, accidentally broken off at the head, has short perforated stumps to allow the fixing of the arms which are, in this case, lost.[30]

The function and use of these figurines, often referred to as "Coptic dolls", is controversial: in the absence of a reliable context of discovery it is difficult to establish the functional and semantic value of dolls or votive objects. Their frequent

24 The area has been excavated by the Polish mission led by Elzbieta Rodziewicz since the 1960ies. Excavations have focused on the area between the ancient streets named 3–R5 and L1 (Via Canopica) and L2, south of the Roman theatre, in the map drawn by El Falaki (see Shenouda 1973). See Rodziewicz 1969:148–152; 1978: 317–336; 1995: 405–411; 1998: 135–158; 2007: passim.

25 The site was identified during emergency excavations carried out by the Centre d'Étude Alexandrines in the 1990ies, under the direction of J.Y. Empereur, at the northern end of the street R4 (Fig. 13, no. 5), near the royal Ptolemaic district. See Empereur 1995; Empereur 2002.

26 Rodziewicz 2007. Appliques with Dionysian and Marine *thiasos* scenes (late 3rd–4th century AD) and plaques with vegetal reliefs (7th–9th century AD).

27 Rodziewicz 2007: 10–11, Pl. 100.4, 5, cat. ns. 53, 52.

28 Marangou 1976: Pl. 70, n. 246 (Inv. 18734). On the Coptic dolls see also Woolley 1907: 218–220.

29 In this group of artefacts, there are also ten female figurines, purchased by Schiaparelli on the antiquities market between 1900 and 1901 in Egypt. These figurines have been dated between the 8th and 10th centuries AD.

30 See Petrie 1927: Pl. 55, no. 596; Elderkin 1930: 477, Fig. 29, Török 1993: Pl. 91, P5, Pl. 113, P11, von Falck 1996: 202, no. 203.

Fig. 10: Unfinished plaque (S. 2133), bone, 3rd–4th c. AD, Museo Egizio, Turin (photo: C. Ghiringhello).

Fig. 11: Unfinished plaque (S. 2479), bone, 3rd–4th c. AD, Museo Egizio, Turin (photo: C. Ghiringhello).

Fig. 12: Floral relief, bone, Byzantine period, Benaki Museum, Athens (after Marangou 1976: Pl. 70, no. 246).

Fig. 13: Female figurine (S. 2457), bone, 8th c. AD, Museo Egizio, Turin (photo: C. Ghiringhello).

discovery in women's tombs[31] and the fact that some of them have truncated limbs or are just simple carved heads and, especially, their small dimensions that make it difficult for children to manipulate them, make us think that they are offerings (*pars pro toto*) for the protection of the growth of girls, icons of female values or evocative of the virginity of the dead.[32]

2.3 Identification of the raw material

One of the difficulties encountered in the study of the ivory and bone artefacts was the distinction between the two types of material: the first, precious and rare, was often replaced and used in parallel with the less expensive bone. In fact, some finds reported as ivories in files, after being studied, turned out to be made of bone.[33]

The identification of the material starting from the finished object was not easy, since the craftsmen often removed and erased the morphological and structural elements useful to recognize the bone or tusk segment used (for example, the articular ends and the spongy tissue for the bone) and they submitted the artefacts to an intense polishing.

Generally, bones from cattle (Fig. 14), goats, equines and camelids were used to make bone objects. We are talking about waste products coming from slaughtering for food purposes, but they were probably not the only raw material sources, since horses and donkeys were not part of this time's normal diet.[34]

By analyzing finished bone objects, we observed both the use of the diaphysis of long bones (mostly *metapodials*, *radii* and *tibiae*) and that of flat bones (ribs and shoulder blades/*scapulae*) of medium and big-sized mammal.

For the long bone segments, the presence of morphological and structural elements in the finished objects (as *epiphysis*, cancellous tissue, the natural longitudinal depression of the external surface of *metapodials*) and the measurements, enabled us, in some cases, to identify the elements of the bone segment used.

Many artefacts in the batch were carved from horizontal section of *metapodials*,[35] which being upright, thick and very robust, were ideal to make convex objects with vertical orientation: like furniture appliques, pyxides, handles and sculptures carved in the round.

The handle Cat. 6447 (Fig. 15) is shaped from a distal bone segment. In fact, the cancellous tissue and also the foramen for the passage of nerves and blood vessels is visible, which appears as black hole on its worked surface. These characteristics as well as the size of the finished object and the thickness of the bone compact tissue (13.6x2.1x0.4 cm) suggest that the find is shaped from the *metatarsal/tibia* of a medium-sized animal.

Some objects, carved from longitudinal sections of long bone, retain traces of the central medullary cavity on the back surface; in these cases, the progressive narrowing of this cavity

31 Wooden and bone dolls were found in tombs from the Byzantine era in Antinoë (Gayet 1902a: Pl. VIII; Gayet 1902b: 46); in Hawara and Lahun some dolls come from Roman and Coptic women's tombs (Petrie 1904: 61–62).

32 For bone figurines of the early Islamic period from Egypt see Shatil 2016: 296–314.

33 The structural and mechanical properties of bone have been analysed in several studies, see MacGregor 1985: 1–9, 23–29; Cutler 1985: 17–19; St. Clair 2003: 1–4.

34 MacGregor 1985: 30–32; Rodziewicz 1995: 406; St. Clair 2003: 2.

35 Parts of the limbs of vertebrate tetrapods belonging to the distal segment which includes *metacarpus* and *metatarsus*. For a discussion on animal anatomy see e. g. Barone 2003; MacGregor 1985: 23–32.

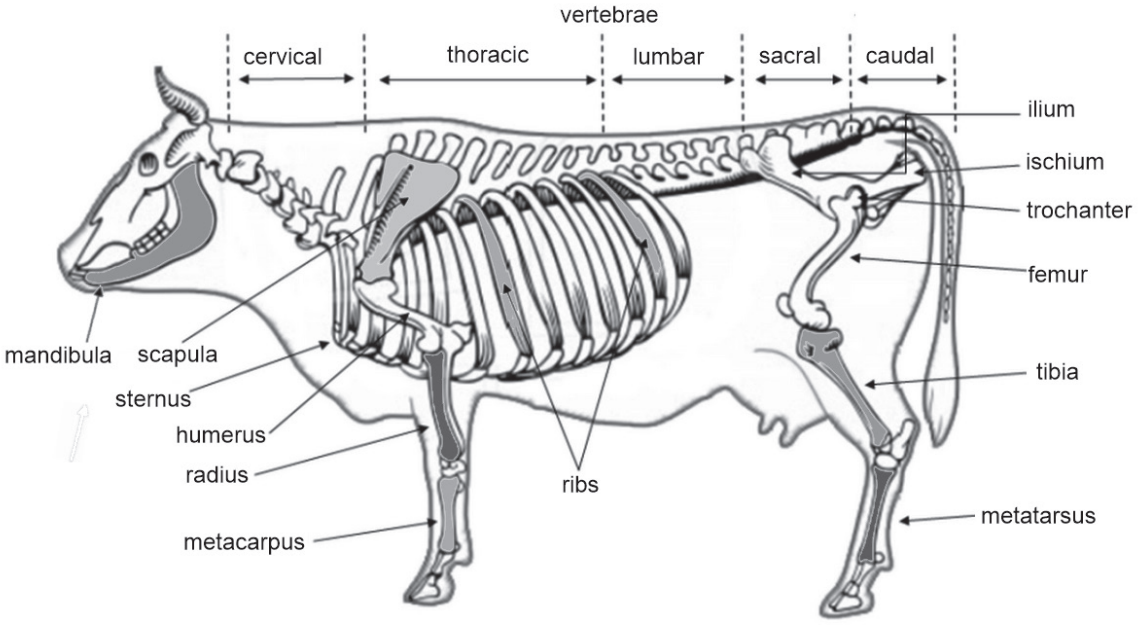

Fig. 14: Bovine skeleton (drawing: C. Ghiringhello).

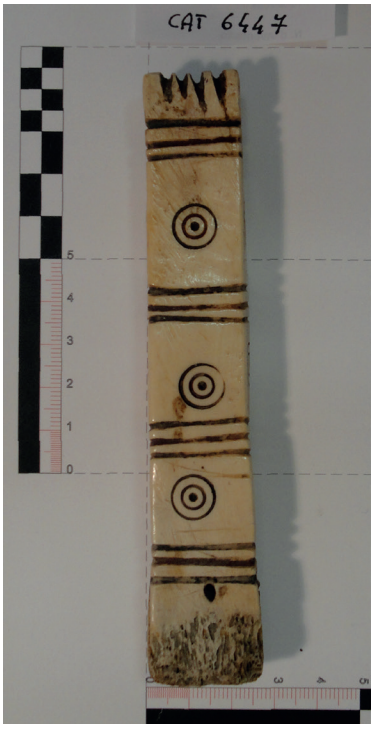

Fig. 15: Handle (Cat. 6447), bone, Byzantine period, Museo Egizio, Turin (photo: C. Ghiringhello).

Fig. 16: Female figurine (S. 1174), painted bone, 7th–8th c. AD, Museo Egizio, Turin (photo: C. Ghiringhello).

and the thickness of the compact bone layer can be useful to understand which part of the bone segment has been used. For example, the diaphyseal end, recognizable from the presence of the *trabeculae* typical of the spongy tissue of the *epiphysis*, has been used to make legs of the female figurine S. 1174 (Fig. 16).[36]

Among flat bones, the scapulae are the most versatile, because it is possible to obtain a flat area of approximately 12x15 cm. This part is optimal for combs or covering plaques. Their sandwich-like structure of cancellous tissue between thin layers of compact bone can be recognized in finished objects on the back surface, even when it is smoothed.

For ivory objects, it is necessary to emphasize that in Egypt, ivory was derived either from elephant tusks or hippopotamus canines and incisors (used from prehistory to the New Kingdom). Ancient sources say that in the Hellenistic Age hippos had disappeared along the course of the high and middle Nile, while they survived in small herds in the marshy areas of the Delta for many centuries to be extinct in the seventeenth century.[37]

From the 3rd century BC, the Ptolemies increased the elephant ivory trade from Africa and Asia Minor to meet the growing demand for this precious merchandise.[38] These two types of ivory are difficult to distinguish in finished objects, especially if they are small, unless they are subjected to microscopic examination.[39] As far as the objects we analysed were concerned, they seem to be made of elephant ivory.

The criteria used to recognize ivory objects were the texture (Fig. 17) and the colour of the material. For example, in a group of ivory gaming pieces and in some furniture appliques from Ashmunein it was possible to spot tusks' growth lines (*Owen's lines*); these are recognizable by a darker colour, visible on the cross and longitudinal section of the tusk. Besides it is possible to see on the cross-sections a grid of curve lines (*Retzius's*

36 For bovine long bones, once the articular extremities are removed, it remains a workable length of 16 cm for the *metatarsus* and about 13 cm for the *metacarpus*: the finished objects obtained from these bone segments generally do not exceed 10–11 cm.

37 Nonnos of Panopoli (5th century AD) and the papyrus of Oxyrynkhos indicate the presence of the hippopotamus in 400 AD. During the Crusades and at the time of pilgrimages to the Holy Land, the hippopotamus is mentioned for the hardness of the leather, suitable for making comfortable and sturdy shoes. Hunters and naturalists saw the animal in the Damietta marshes during the 17th century. Goyon 2000: 149–153.

38 Strabo (Gheographikà 16. 769, 770) mentions the sending of an expedition to the shores of the Red Sea during the reign of Ptolemy II in 270 BC to evaluate the possibilities of undertaking elephant hunts. The abundance of animals was such that it was decided to found the city of Philotera as a base for hunting, and a few years after Tolemaide Theròn. Casson 1993: 247–260; Scullard 1974: 126–137; Barnett 1982: 65–66.

39 Elephant tusks and hippopotamus teeth are composed of dentin, a substance composed of calcium and magnesium phosphates. These are teeth of continuous growth and therefore devoid of roots. For this reason, the dentin is presented in a series of layers called *lamellae*. The ivory of the hippopotamus differs from the elephant one for the different structure and the different appearance of the *lamellae*, which determine a finer and more compact stratification that makes this material suitable to be cut into thin plates. Reference here be made to significant works by Penniman 1952: 23–24, Pl. 20; Ritchie 1969: 25–48, Fig. 5; Barnett 1982: 8; MacGregor 1985: 14–19; Cutler 1985: 1–19; Caubet/Poplin 1987: 273–306; Krzyszkowska 1988: 209–234; Bass/Pulak 1990: 1–29; Wilkens 2002: 82; Krzyszkowska/Morkot 2000: 320–331; Goyon 2000: 147–156; St. Clair 2003: 4–6.

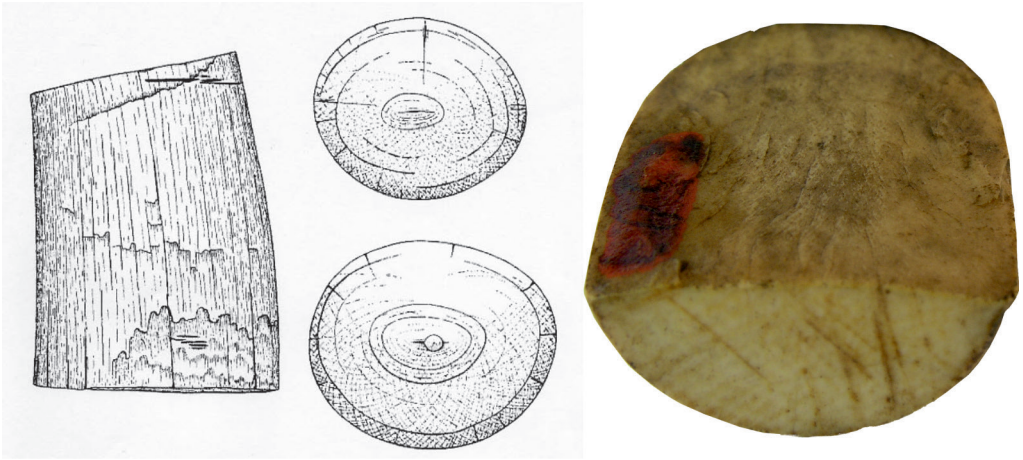

Fig. 17: Ivory texture (drawing: Bass/Pulak 1990: 284, Fig. 18), gaming pawn (S. 2504), ivory, Museo Egizio, Turin (photo: C. Ghiringhello).

lines). The lines radiate from the pulp cavity, parallel among themselves, forming a small rhombus shaped grid (Fig. 18).

Even the state of preservation can help to recognize the material: the ivory is vulnerable to changes of temperature, which affect colour (from white to yellow-brownish shades when exposed to highest temperature) and chemical composition.

The elephant tusks have the tendency to delaminate and to crack along the growth rings (cone into cone). The knob S. 2159 (Fig. 19) provides an excellent example of the ivory tendency to crack and delaminate.[40]

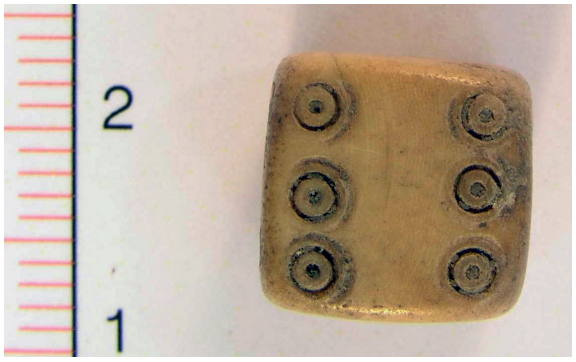

Fig. 18: Ivory texture, die (S. 2473), 3rd–8th c. AD, Museo Egizio, Turin (photo: C. Ghiringhello).

2.4 Technology: *modus operandi*

The examination of bone finds has, in some cases, allowed us to recognize the working procedures of the craftsmen and the tools used in the processing of the raw material. It can be seen how the craftsman determined his *modus operandi*, according to the shape, the dimensions and the physical properties of the raw material. For example, the natural holes (*foramina*) near the proximal and distal *epiphyses* on long bones could be used to introduce the fixing rivet in the handles and furniture appliques (Fig. 20). Some of the artefacts show the usage of bone segments in which the natural longitudinal depression on the external surface of the *metapodials* is present (Fig. 21). First phases of manufacture of raw material can only be hypothetically reconstructed.

40 The layers of dentine (*lamellae*) cannot be seen in fresh ivory, but when the material begins to decay, it will usually exfoliate as concentric layers. Krzyszkowska 1988: 211.

Fig. 19: Cap/knob (S. 2159), ivory, Byzantine period. Cracks along the growth rings, Museo Egizio, Turin (photo: C. Ghiringhello).

Fig. 20: Foramen *preserved in an applique carved as a theatrical mask (S. 1185), bone, 3rd–4th c. AD, Museo Egizio, Turin (photo: C. Ghiringhello).*

After slaughter, the bones had to be cleaned of tendon and meat residues, and the *periosteum* sheath also had to be removed. These operations could be long and complex: the bones were probably placed under the sand to let the parasites clean them; moreover, heat favoured the ageing of the bones and determined their whitening. For the elimination of the membrane (*periosteum*) perhaps the bones were soaked or boiled for a long time.

To try to understand the preliminary procedures for cleaning and seasoning the bone we performed an experimental test, using fresh bovine bones. In our experiment, the boiling operation to facilitate the elimination of organic matter took several hours, after which the membranes were mechanically removed (not without difficulty). After this stage, the bone material was soaked in cold water for 48 hours. The process softened the raw material, so it could be processed more easily with a knife and it was also more flexible.[41]

The material was then selected according to the size and shape, sawn, engraved and subjected to a further smoothing to eliminate residual stains. Sometimes economic reasons led to the utilization of the primary production scrap pieces.

The analysis of tool marks, with the help of magnifications, allowed the identification of the used instruments. The backs of the plates often show parallel or slanted marks left by different shapes of chisels, and gouges that were used to even out the surface (Fig. 22). Dice and gaming

41 See MacGregor 1985: 51–64.

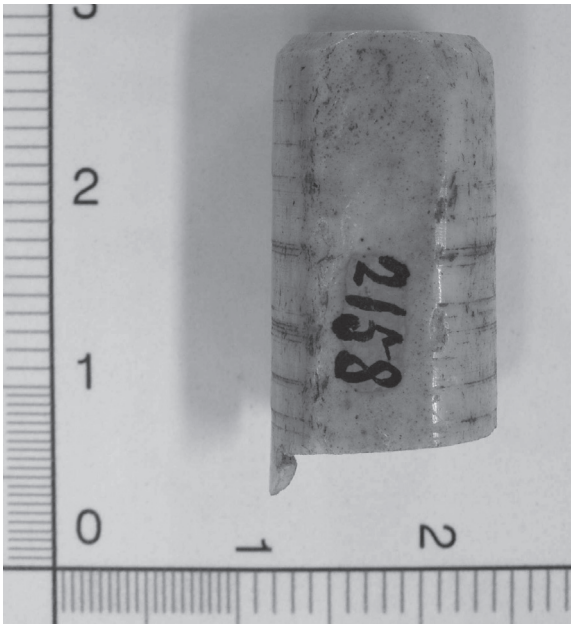

Fig. 21: Natural depression preserved on the surface of a handle/applique (S. 2158), bone, Byzantine period, Museo Egizio, Turin (photo: C. Ghiringhello).

Fig. 22: Tool marks on the back surface of flat bone plaque (S. 2480), Museo Egizio, Turin (photo: C. Ghiringhello).

pieces show the usage of lathes and compasses to engrave dotted circles. Probably the tools used were similar to those used by the craftsmen who worked on the wooden objects.

Some finds show second thoughts or errors made by the craftsman. For examples, in the figurative relief plaques, the craftsman was often forced to compel the figure on just one plaque or to develop it on two adjacent plaques. In the plaque S. 2131 (Fig. 23), the strong inclination of the figure has not allowed the realisation of the legs on the plaque, which is only 3.2 cm large; the legs were probably realized on the adjacent one. A slight circular depression can be seen on the left side of the vegetal relief plaque S. 2483 (Fig. 24). This depression is probably the trace of a not completed hole, intended for the insertion of the fixing rivet; the hole was probably realized a bit further up.

The colour of the material ranges from yellow to reddish-brown; the dark colour can be caused

Fig. 23: Plaque (S. 2131) carved in relief with a male figure (Cistophoros/Askophoros), bone, 3rd–4th c. AD, Museo Egizio, Turin (photo: C. Ghiringhello).

Fig. 24: Circular depression (unfinished hole) on the vegetal relief plaque (S. 2483), ivory (?), 4th–5th c. AD, Museo Egizio, Turin (photo: C. Ghiringhello).

by the laying conditions in the finding context (natural processes within soil), but we cannot exclude the presence of a treatment carried out by immersion in herbal teas rich in tannins or in a brine with mineral pigments for some of the finds.

In the assemblage, one female figurine shows a brown glossy and uniform "patina" throughout its entire surface and a small head (perhaps an idol) was carved on a bone with shades from dark brown to dark purple (Fig. 25).[42] In both finds, the colouration is uniform and the colour was absorbed by the layers of bone tissue: these observations allowed us to make assumptions about the colouration process.[43] Such practices are still used by craftsmen to colour this kind of objects.[44]

42 Female figurine S. 1178, purchased by Schiaparelli in Egypt; idol S. 158, Kircher Collection. For comparison Török 1993: Pl. 93, P11; Pl. 94, P14, P15; two dolls (bone dark brown) kept in Petrie Museum in London: UC25347, UC25394. UCL Museums & Collections, Petrie Museum Catalogue http://petriecat.museums.ucl.ac.uk/. See also Shatil 2016: 305–307.

43 Recent finds in the city of Reims have led to the discovery of manufactured bone objects coloured in green. Ferrand/Rossano 2013: 1024–1040.

44 I saw this technique used by bone craftsmen in Gaziantep in Turkey.

Four coloured bone plaquettes, found in Ashmunein, belong to a very specific category of engraved appliques: they are cut in *intaglio* and combined with coloured fillings made of resin and wax (S. 2134, S. 2135, S. 2480, S. 2481). The image and the details were etched with thin tips, while the surface that had to be filled with coloured resin was carved with a slightly rounded chisel: in these plaques traces of red and green resin are still visible (Fig. 26). The technique suggests a connection with the jewellery technique of *cloisonné*. This elegant category of appliques is quite rare; besides decorating so-called bridal caskets made of wood,[45] they could be used as book covers.[46]

2.5 Objects carved in the round, figurative and vegetal appliques: aspects of the iconographic repertoire

The iconographic themes present on the figured artefacts (carved appliques with vegetal and figurative motifs, plaquettes cut in *intaglio* and the appliques carved in the round) testify to the persistence, until late antiquity, of a taste for iconographic themes typical of the Hellenistic repertoire. The figurative motifs were chosen according to the function of the objects that the plaques were to embellish and also with attention to the symbolic meaning associated with these iconographies.

Fig. 25: Coloured female figurines (S. 158, S. 1178), bone, 7th–8th c. AD, Museo Egizio, Turin (photo: C. Ghiringhello).

The scenes depicted on three incised plaques with coloured fillings (S. 2134, S. 2135, S. 2481) present in our assemblage evoke the landscape of the Nile inspired by the Alexandrine style and follow probably pictorial prototypes adequate to bridal/toilette caskets: common moorhens (S. 2134)[47] and ducks (*Anas clypeata*) with colorful plumage (Fig. 26) gliding through canes and *nelumbos* (water lilies).[48]

45 To this group belongs the casket of the British Museum (Inv. no. 5555) and another one from the Walters Art Gallery in Baltimore. Randall 1985: Cat. no. 135, Pl. 44. Many wooden boxes and chests decorated with painted bone plaques have been found in the Nubian necropolis of Karanog, Gebel Adda and Qustul (tomb 14); they can be dated to the 4th century AD. Woolley/Randall-MacIver 1910: 69, Pls. 21–22, 24.

46 Rodziewicz 2007: 55.

47 The plaque S. 2134 is similar to a small plaque kept in the Graeco-Roman Museum in Alexandria. For comparison see Bonacasa Carra 2000: 354, Fig. 3, Inv. 13353.

48 The popularity of the floral landscape scenes animated by birds and erotes is attested mostly by mosaics from Palestine, North Africa, Italy, and Galia etc. until the 6th century AD. An interesting study on Nilotic subjects in the mosaic and their meaning in Balty 1984: 827–834.

Fig. 26: Incised plaque with Nilotic landscape (S. 2481), bone, coloured wax, 3rd–4th c. AD, Museo Egizio, Turin (photo: C. Ghiringhello).

Fig. 27: Incised circular plaque with young man and feline (S. 2135), depicted bone, resin, 3rd–5th c. AD, Museo Egizio, Turin (photo: C. Ghiringhello).

Often this landscape is animated by young men or erotes as, for example, on the plaque with curvilinear profile S. 2135 (Fig. 27); here a young man is depicted holding out his hand towards an animal that is not easily recognizable (feline/volatile).

These plaques have many comparative objects: plaques housed in the Graeco-Roman Museum at Alexandria;[49] bone panels from Saqqara in the Coptic Museum, Cairo;[50] a plaque from the Roman necropolis of Kôm el-Nigili in the Nile Delta (Fig. 28)[51] and a triangular plaque in the Mediterranean Archaeology Museum of Marseilles.[52]

The iconographic comparison with the material coming from proven contexts allowed to obtain a precise dating of the plaques carved with vegetal and figurative motifs and of the appliques carved in the round present in our batch. It was possible to reconstruct the compositional scheme of these plaques on wooden boxes (bridal boxes) and furniture to which they were destined.[53] The plaques are "the frames" of a larger composition: mythological scenes in which perhaps Dionysus,

49 Botti 1900: 113, Cat. nos. 2016, 2074; Rodziewicz 2007: 56.

50 Strygowsky 1904: 178–179, nos. 7065–7067, Abb. 233, 234.

51 Rodziewicz compares this scene with a similar one present on one plaque purchased on the antiquities market in Cairo and published by Strzygowski (see Strzygowski 1902: 14, Abb. 12). Rodziewicz 1995: Pl. LXXV, figs. 2 (plaque from Kôm el-Nigili) and 3 (drawing from Strzygowski 1902: 14).

52 Marseille 1997: 104–105, cat. 105, Inv. 2439.1.

53 For a reconstructive hypothesis see Elderkin 1926: 155, figs. 1–4. The scholar reconstructs the original position of six carvings with figures of Nereids preserved in the Princeton Museum, pertinent to the same box. Elderkin also considers two fragments of Pittsfield's Berkshire Athenaeum to be pertinent to the same box. In this way the approximate dimensions and the shape of the box that these plaques adorned can be determined.

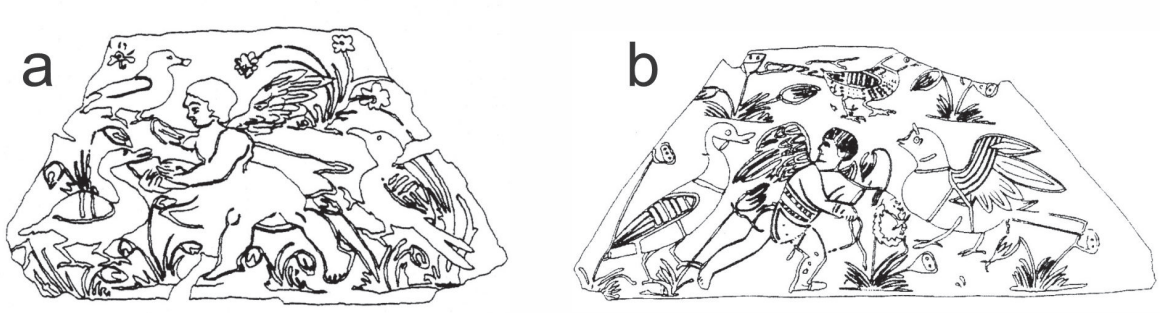

Fig. 28: Appliques from antiquities market (a) and Kôm el-Nigili (b) (drawings: Rodziewicz 1995: Pl. LXXV, figs. 2, 3, in: Bonacasa, N. (ed.), Alessandria e il mondo ellenistico romano, Atti del II Congresso Internazionale Italo-Egiziano, Alessandria 23–27 novembre 1992, L'Erma di Bretschneider, Rome 1995).

accompanied by a festive suite of Satyrs and Maenads, or Aphrodite were also present. They recall mythological scenes of Dionysian and Marine's *thiasos* according to the schemes of the Neo-Attic reliefs on sarcophagi or Roman mosaics of imperial age.[54]

The caskets were often parallelepiped in shape with a truncated cone-shaped lid: the slides could have been embedded or just glued in separate compartments creating complex scenes.

In plaque S. 2472 from Ashmunein, dated to end of the 3rd century AD, a scene of marine *thiasos* can be recognized: a reclining Nereid (Fig. 29) leans with her right arm on a rock/body of a Triton (?), while the other hand is holding a piece of the *himation*.[55] In this case, the trapezoidal shape of the plaque allows us to deduce its position on the original support: probably a panel placed on the top of the casket.[56] The subject of the *thiasos* recalls the wedding and so it is underlining the function of bridal boxes (Fig. 30).[57] In fact, the Nereids, being related to water, are part of Aphrodite's world and they have a strong erotic value. These scenes are also present on Coptic tissues and funerary reliefs.

The iconographic comparison made it possible to identify the themes carved on two more plaques found in Ashmunein as scenes related to Dionysian *thiasos*. In plaque S. 2131 it is possible to recognize a Cistophoros/Askophoros: he is a young man of the Dionysian *cortège* carrying the equipment for the celebration of the banquet (Fig. 23). The iconographical comparisons allow

54 Rodziewicz 2007: Pl. 100.4, 100.5. In the vast literature on roman sarcophagi see e.g. Zanker/Ewald 2008: 117–134, 323–331.

55 About the iconography of the Nereids in the Archaic and Classical ages see Becatti 1971: 15–59; Marangou 1976: 42–44, n. 215; Bonacasa Carra 1995: 280. A broad discussion on the subject is found in Barringer 1991; Barringer 1995: 387–388.

56 The caskets preserved in the British Museum, at the Walters Art Gallery in Baltimore, and at the Coptic Museum in Cairo are decorated according to this scheme, to mention only some of the best-known examples (supra fn. 45). Strzygowski 1904; Randall 1985: cat. 135, Pl. 44; Engelbach 1915; Woolley/Randall-MacIver 1910.

57 The nuptial casket of Projecta and Secundus of the Esquilino's treasure, 2nd half of the 4th century AD, London, British Museum, is similar in shape and function to the caskets in bone and wood. See Shelton 1981: 72–75.

Fig. 29: Plaque with reclining Nerid (S. 2472), bone, 4th c. AD, Museo Egizio, Turin (photo: C. Ghiringhello).

to reconstruct his posture: his head was turned three quarters; his right arm was lowered, probably he carried a cist (basket) which is sometimes full of grapes. The type is usually represented with his left arm bent above his head or while carrying a leather goatskin on his shoulders.

The plaque of the Museo Egizio is similar to two plaques preserved in the Greco-Roman Museum of Alexandria dated by Bonacasa Carra between the 3rd–4th century AD and finds exact comparisons in coeval plaques of the Benaki Museum in Athens.[58]

The Dancing Satyr S. 2478 (Fig. 31) is recognizable by the goat-like attributes. The compositional scheme is well known: the torsion of the body, the head facing down and the position of the raised left leg indicate that the figure is dancing (dancing Pan). The piece is unfinished perhaps because of an executional mistake: in fact, the right leg is too long and therefore it was not possible to make the hoof.

Two small plaques with vegetal motifs (Fig. 24) from Ashmunein are dated between the late Byzantine and the early Ummayad period.[59] In the late Byzantine and early Islamic periods, the reliefs with vegetable motifs replace figurative reliefs in the decoration of boxes and luxury furniture. These motifs have their direct comparison in the ornamentation of civil, religious and funerary architecture,[60] and also in clothes between 5th–8th century AD.[61]

In the Coptic decorations the motifs of acanthus and ivy leaves and vine scrolls are predominant, because of their symbolic meaning. To the original funerary meaning of the acanthus is added the evocation of the Passion of Christ (because of its thorny shape). In the vine scroll there is a convergence of meanings present both in the Osirian belief and in the Dionysian cult, passed then to the Christian religion, for which every Christian is like a vine shoot.

58 Alexandria, Graeco-Roman Museum, Inv. 13242, 12109 (Bonacasa Carra 1995: 280–281, Pl. XXXV, 2). Athens, Benaki Museum, n. 21876 (Marangou 1976: 33, Cat. 50, Pl. 15d).

59 Strzygowsky 1904: 193, 197; Randall 1985: 149–151, nos. 117a, b, c; Shahin 1998: 371–376; Rodziewicz 2007: Pl. 101.8., Pl. 102, n. 3.

60 See portal of St. Barbara Church, Cairo, Museum of Coptic Art, 5th–6th AD, architectonic decoration from White Convent, Sohag, Deir el-Abiad, 440 AD, frontons of funeral grave stones (1a 5831), Moscow, The Pushkin State Museum of Fine Arts, limestone, 4th century AD.

61 See plaques from the Roman-Byzantine district of Kôm el-Dikka in layers of the 7th–9th century AD. Rodziewicz 2007: 27–28, 55, Pl. 102, n. 3.

Fig. 30: Jewellery box with Dancers and Faun (Acc. no. 70.41), wood, bone, coloured wax, 4th–6th c. AD (photo: The Walters Art Museum, Baltimore).

Fig. 31: Plaque with Dancing Satyr (S. 2478), bone, 4th c. AD, Museo Egizio, Turin (photo: C. Ghiringhello).

Fig. 32: Theatrical mask (Cat. 6449), bone, 1st–2nd c. AD, Museo Egizio, Turin (photo: C. Ghiringhello).

A theatrical mask (C. 6494)[62] of characters from the New Comedy (Fig. 32), an applique with an acephalous male figure, maybe a resting Heracles, and an applique carved in the round at the top with the figure of a charioteer driving a chariot are stupendous rediscoveries of manufactures from the Roman period that have been made by inspecting warehouses; they could be furniture appliques.

2.6 Miscellanea

Inside our heterogeneous batch we can find also objects of everyday use, like gaming pieces, pins, writing implements, cosmetic palettes, spindle whorls, tools, ornamental band/strips for decoration of cases and furniture and semi-finished products.

Part of these finds come from Ashmunein and some of them were purchased by Schiaparelli in Egypt, confirming thus his further attention for Late Antiquity daily use objects.

In this paper, we present a preliminary report on some of the most interesting finds within the different categories of artefacts.[63]

In the group of gaming pieces there are 20 dice. The dice have a fairly regular shape and the value on each side is engraved in the form of single or double concentric circles, from one to six, so that the sum of the opposite faces gives 7 (6-1, 4-3, 5-2). Some dice show traces of a coloured substance in the engraved circles.

The fragmentary die S. 2475 was made from a transverse section of long bone; originally the medullary cavity was closed with a bone plug to reproduce a solid cube. This die shows a rare type of display of values, since the value of 7 is incised on its side. There are dice with 7, but normally, this value replaces the value of 6; in this case, instead, the value of 7 is on the side next to the one where the value of 6 is engraved, rather than replacing it. The dice is missing two sides, however, if we assume that the values on the cube are in the normal position (6-1, 4-3, 5-2), the value 7 should probably replace the value 5 or the value 2, usually engraved on the sides adjacent to the side on which the value 6 is engraved.

A flat fish-shaped plaque (S. 2482) could be classified as game *tessera* (gaming counter) or theatre admission ticket (Fig. 33): a few similar specimens of this type are known, and one of these is kept at the Graeco-Roman Museum of Alexandria.[64]

The game pawns are dated between the 3rd and the second half of the 5th century AD. These have a flat base with a diameter ranging from

62 Theatrical mask C. 6494 (6x4 cm), bleached, carved, engraved and polished bone, 1st–2nd century AD. The mask is carved in the round, obtained from a rather thick tubular bone segment (0.3 <0.6 cm). The external surface has been carefully smoothed and polished, the internal one also smoothed, and it shows grooves with oblique course performed with a thin point to eliminate the spongy tissue, of which traces remain. The mask probably depicts a character from the New Comedy, perhaps an old man (*pappos therapon*) or a curly servant (*oulos therapon*). The type is well attested also in Pompeian fictile *oscilla*, in configured oil lamps and in luxury dwelling mosaic apparatuses, above all in the African provinces, datable between the beginning of the 2nd and 3rd century AD. Bernabó Brea 2001: 172–177, 220–228.

63 We are working on the publication of these categories of artefacts.

64 Alexandria, Graeco-Roman Museum, Inv. 26877 (Riad 1966: Pl. IV.6.). On the discussion see Rostovtzew 1905: 110–124.

0.6 cm to 2.5 cm and the top is convex.[65] Two of these "dome" pieces are made of ivory (S. 2503, S. 2507), while S. 2489 was made from a cross section of a long bone. This gaming piece is cylindrical, slightly rounded on top and flat on bottom. Sunken bone plugs fill up the empty space, created by the removal of the marrow, from the top and bottom. At the bottom, the plug has an irregular shape and exposes slots around; plug at the top is decorated with shallow groove around the central point which shows a slight depression (Fig. 34). Thus the carvers filled the medullary cavity when it was necessary to create a solid object.[66]

The largest group in the batch consists of 51 pins.[67] They belong to mass products that are found in all excavated sites of Graeco-Roman and Byzantine periods in Egypt.[68]

The pins were used, since ancient times, for ornamental purposes in clothes or hairstyles, but since the mode of use varies with time and place, it is not always possible to distinguish between real hairpins and dress-pins. However, in the Roman and Byzantine periods bone and ivory pins are supposed to have been worn mainly to adorn and support the hair, while the dress pins were made mostly of metal.[69]

In regard to the various forms of their heads, our pins can be divided into several types with their numerous variations:

- **Knobbed head**: spherical, oval and cylindrical heads of different sizes; the pinheads were made separately and attached to the shaft. This group of pins have a smooth or grooved "neck" and a different thickness of barb
- **Pear-shaped** or **pine-cone head**: used especially from the middle of the 3rd century AD onwards
- **Pomegranate heads**
- **Baluster head**: head shaped as combinations of beads and reels. The type is common in the Roman layers of the 3rd–4th century AD
- **Head with a human bust/female figures and with animals** (S. 2459 cock-head)

Among the everyday objects, related probably to the feminine world, there are a delightful comb (S. 2141) with an engraved figurine, two cosmetic palettes (S. 2508, S. 2509) and two spindle-whorls, one of these with convex disc (S. 2155) that is decorated with engraved concentric circles, filled with coloured resin.

Many ornamental, shaped frames and strips with spiral, string and astragalus decoration, some carved with great care and painted (S. 2524) for boxes or furniture decorations, are also present.

One group consists of edges with spiral or cord/braid decorations (S. 2160–2163, S. 2519, S. 2520). Generally, we accept the hypothesis that these plait decorations did not enter into common use until the 5th century AD although, sporadically, they appear in earlier times.[70]

65 This type has often the top furrowed by two concentric circles made with a compass.

66 St. Clair 2003: 3; Rodziewicz 2007: Pl. 64, cat. 532, 534.

67 Fifteen pins come from the excavations of Ashmunein, five from Hammamiya, three from the Valley of the Queens, seven have been purchased on the antiquities market in Egypt. Twenty-one of these have a temporary inventory number, so it is impossible to identify their site of origin.

68 Some of the types in our batch correspond to types found in several sites throughout the Greco-Roman world. For references to comparative material see Béal 1983: 183–219; id. 1984: 1984: 49–59. See also St. Clair 2003: 80–98.

69 Rodziewicz 2007: 29.

70 Rodziewicz 2007: 33, p. 30, nos. 114, 116, 117, 120.

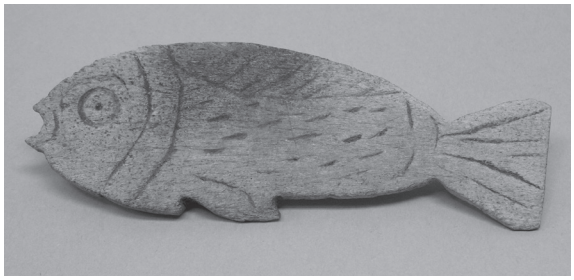

Fig. 33: Flat fish-shaped tessera *(S. 2482), bone, Byzantine period, Museo Egizio, Turin (photo: C. Ghiringhello).*

Fig. 34: Game pawn (S. 2489), bone, second half of the 5th c. AD, Museo Egizio, Turin (photo: C. Ghiringhello).

A second group includes fragments of bone rods with so-called pearl or astragal ornaments (S. 2493/3); similar objects were found in large numbers by W. M. F. Petrie in a pile of burnt debris in Scenas Mandras.[71]

Finally, the batch includes: six bone tools, some semi-finished bone segments and raw material. Most of these finds were purchased by Ernesto Schiaparelli on the antiquities market in Egypt, while a small group of unfinished objects (S. 2524/01-04) comes from Evaristo Breccia's excavations at Ashmunein (1903–1904).

Among the tools, five belong to the category of awls with one pointed end, in a variety of sizes.

They have been shaped from long bones of medium and big-sized animals. In this category of tools, a tendency can be observed to use the distal portion of *tibiae*, *ulnae*, *radii* and *metapodials*, more as a handling base.

Three of these (S. 1101, S. 1102, Provv. 5746) were shaped on whole bones that retain one *epiphysis*, which was used as a handle (Fig. 35), while only one bone end was sawn sideway. The tip of the active end of these tools is more or less pointed depending on the degree of wear of the tool.

The external surface is carefully smoothed and polished, but there are also traces of horizontal incisions (traces of processing). The medullary cavity of the bone has been emptied of the sponge tissue, which is preserved only near the *epiphysis*.

Two more long and narrow tools with pointed end (S. 1106, S. 1125) were obtained from portions of long bone sawn lengthwise from small-sized animals. The external surface has been carefully polished, and the porous material has been removed from inside, probably to facilitate the use of the tool, ensuring better handling.

Such tools were widely used by all kinds of craftsmen in their daily activities. These awls would probably have been used to punch holes in leather or cloth and its highly polished surface suggests that it was well used. The narrow tools with one end pointed could have been used as weaving tools.

We also mention a long, flat tool (Fig. 36) tapering toward the rounded end (Provv. 5735). It is shaped from a distal portion of bone (probably a *tibia* of a middle-sized mammal) sawn in longitudinal section. The carver left the distal *epiphysis*, which he modelled and smoothed, on both sides, in order to eliminate roughness and to produce a flat base on the internal surface; in fact, on this side, the edges of the compact tissue are perfectly smooth. The internal surface of the bone preserves the spongy tissue in the *epiphysis*, while the cancellous tissue has been removed from medullary cavity, in order to create a sort of "spatula" or spoon.

71 Engelbach 1915: Pl. XLIX.

Fig. 35: Pointed tool (S. 1101), bone, Museo Egizio, Turin (photo: Cristina Ghiringhello).

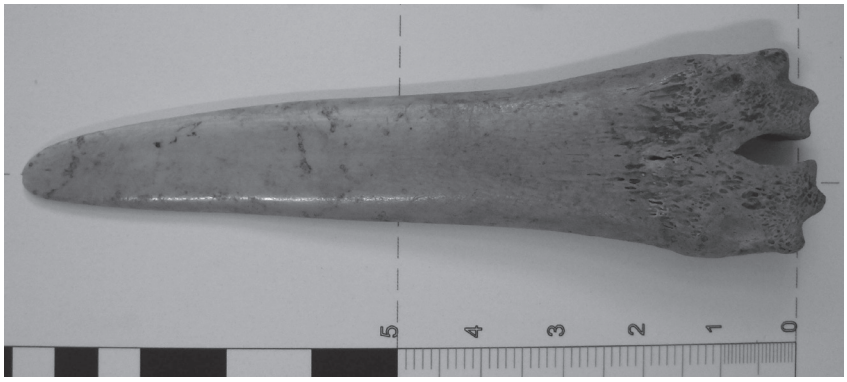

Fig. 36: Tool/spatula (Provv. 5735), bone, Museo Egizio, Turin (photo: Cristina Ghiringhello).

These categories of artefacts belong to the oldest tool types. Similar pieces can be found as early as prehistoric times.[72] Since their shape, working and function remained the same from prehistoric times up to the medieval period, in the absence of a reliable context of discovery, it is hard to date them.

The group of half-products of our assemblage consists of transverse sections of long bones which show various stages of production. Some semi-finished segments still show traces of the central membrane or of the trabeculae of the spongy tissue. Their surface shows manufacturing evidence of preliminary working (cutting and shaping): uniform traces of cutting tools are visible, such as blades, knives, and gouges.

Their preliminary shape is generic and could serve for a variety of objects such as pins, veneers or mounts. Some of these, in a more advanced processing stage, can be identified as furniture elements (bands, strips), since holes for attachment were drilled near edges on their surface.

2.7 Conclusions

The study of this corpus of heterogeneous artefacts offered the opportunity to shed new light on the context of problematic excavations such as that of Ashmunein and to make a contribution to the methods and technologies which the

72 For comparison see prehistoric bone tools, dated to the Badarian Period, kept in the Petrie Museum, London: UC9339, UC9346, UC9379, UC9382, UC9383, UC9384 (from Badari) and UC27777. UCL Museums & Collections, Petrie Museum Catalogue, London 2019: http://petriecat.museums.ucl.ac.uk/.

craftsmen of bone and ivory used in Egypt in the Roman and Byzantine periods.

Comparisons with objects from bone and ivory found in the contexts excavated with stratigraphic methods, above all the Roman quartier of Kôm el-Dikka in Alexandria, have made it possible to provide a convincing dating for many of the pieces examined and also to clarify the cultural scope of production. The wide chronological range of these finds seems to confirm the information provided by Breccia on the excavation of multilayered settlements in the NW area of the city of Hermopolis Magna dating between the Roman and early Islamic period.

Furthermore, the iconographic and stylistic analysis of representative finds gives us a better chance to identify the features of continuity and change in this category of artefacts. The appliques with figurative or vegetal motifs and the objects carved in the round from Ashmunein are very similar to contemporary finds from other sites, in the iconographic choices, in the decorative motifs and in their stylistic rendering.[73]

The figurative motifs exploit an Hellenistic iconographical repertoire (scenes of Dionysian and Marine *thiasos*, Nilotic landscape etc.) and show an artistic level, sometimes high, sometimes simplified in their execution. These examples are proof of how iconographic subjects can survive until late antiquity, often emptied of any allegorical or symbolic meaning and reduced to simple decorative motifs. In particular, the vegetal reliefs show changes that mark the shift from Graeco-Roman prototypes towards greater stylisation, typical of the Byzantine period.[74] Furthermore, their finding in the site (as well as that of the "Coptic dolls") could confirm the presence of active bone and ivory carving ateliers in Ashmunein as late as the early Ummayad period.

The high quality of many of these finds confirms the evidence that is emerging in recent years thanks to the discovery of objects in bone and ivory from the Roman and Byzantine period in numerous Egyptians sites, namely that the works of excellent quality must not be ascribed solely to Alexandrian craftsmen.

Therefore, the work in museum warehouses, as this case demonstrates, can be profitable not only for the purpose of dissemination and knowledge of what the museum holds, but also as a stimulus for new research and in-depth studies on a small but "extra-ordinary" and so far almost unknown heritage.

Cristina Ghiringhello

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73 Bonacasa Carra 2000: 357; Rodziewicz 2007: 14–16.

74 These reliefs attest their role as widely accepted replacement in the 8th to 10th centuries AD of previously favoured figurative reliefs. Rodziewicz 2007: 27.

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Implications for Trade – Weights from Tell el-Dabʿa as Indicators of Eastern Mediterranean Influence on Egypt

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Within the archaeology of Ancient Egypt there has been little to no focus on balance weights. Weights dating from Egypt's Middle Kingdom are mainly parallel-epipeds; the common unit is called *dbn* and weighs, as was the case in the Old Kingdom, c. 13–14 grams. In the New Kingdom, the metrological system changed whereby a *dbn* weighed c. 91–94 grams, which was then subdivided into ten *ḳdt*. Along with the system, both shape and material were subject to change. Weights dating to the New Kingdom are often termed 'sphendonoids' (sling-bullets). These frequently consist of dark iron-rich sedimentary rock like hematite, a distinctive material apparently not used for weights in Egypt before the Second Intermediate Period. However, such shapes and materials were typical for weights in Syria and Mesopotamia from the Early Bronze Age (EBA). It is therefore a likely hypothesis that the fundamental change in Egypt can be linked to the rule of the so-called Hyksos kings during the Second Intermediate Period. This assumption is further supported by the fact that the *dbn* of the New Kingdom, divided by ten, corresponds with the 'Syrian *shekel*' of c. 9.1–9.4 g. This mass-unit was widely used in the eastern Mediterranean and facilitated international trade. Excavations in Tell el-Dabʿa/Avaris, the capital of the Hyksos kings located in the Eastern Delta, recovered approximately 50 weights. Made of iron-rich minerals such as hematite, these weights are often sphendonoid in shape and support the use of both the 'Syrian' and 'Mesopotamian' (c. 8.3–8.4 g) *shekel* weighing system. Of special interest is one particular assemblage including two sets of weights, deriving from a tomb dated to the later Hyksos period. Weights are not known from other grave assemblages during the Old and Middle Kingdom in Egypt whereas they occur in burials in Syro-Mesopotamia, the Levant, Anatolia, the Aegean and the Gulf region. The findings from Tell el-Dabʿa and the comparison to these regions contribute to our understanding of the time of the Hyksos kings as a period of change. The innovations which reached Egypt from the East consisted not only of tools for warfare, but also of tools for trade like the new type of weights presented here.

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1 Introduction

Within the archaeology of Ancient Egypt, balance weights and the associated metrological systems never received much attention. Petrie's nearly 100 year old book 'Ancient Weights and Measures' remains the main publication on the material.[1] Nearly 30 years ago, M.-A. Cour-Marty evaluated 3411 Egyptian weights from different periods, however, only a small amount of them are provenanced or can at least be dated by an inscription.[2]

At present, the origins of weight use in Egypt are hard to trace. For some isolated stone objects dating to the Naqada period (Fig. 1a) it remains to be proven that they are indeed weights as suggested by Petrie.[3] These objects, recovered from graves during Petrie's excavations,[4] are few and were mostly found individually in the tombs.[5] A hemispherical stone object with the cartouche of King Narmer, now kept in the "Staatliches Museum für Ägyptische Kunst" in Munich, is likely a weight, but has no context (Fig. 1b).[6] A stone balance beam (Fig. 1a) without provenance was dated by Petrie to the Predynastic period because of its distinctive material.[7] There is, however, a high probability that it dates to the early or mid-third millennium BCE as a similar depiction from the 3rd dynasty tomb of Hesy-Ra in Saqqara implies (Fig. 1c).

With the emergence of the third Dynasty, a canonical shape of balance weights had developed in Egypt (Fig. 2a). They show a parallelepiped form, a dominant shape that continues to be popular during the Middle Kingdom (Fig. 2b).[8] A wide variety of types of stone were used, but iron-rich sedimentary rocks, like hematite, are only documented in extremely rare cases during the Old and Middle Kingdom. The inscribed and marked weights imply different weight units. One of these units, which is difficult to define precisely, weighs c. 13–14 grams.[9]

During the period of the New Kingdom, several considerable changes occurred: hematite became the dominant material; the parallel-epiped shape declined in popularity and became replaced by various shapes: they are often 'sphendonoid' (sling-bullet, Fig. 3),[10] but also in the shape of animals or even of human heads.[11] The theriomorphic weights were predominantly made of bronze.[12] The metrological system also changed in the New Kingdom to a *dbn* weighing c. 91–94 grams (the range of error can be much higher), subdivided into ten *ḳdt* (c. 9.1–9.4 g).[13] These multiple changes to the Egyptian weight tradition seem to have occurred during the Second Intermediate Period. It is a likely hy-

1 Petrie 1926.

2 Cour-Marty 1990; only 238 of these can be securely dated to different periods before the New Kingdom.

3 According to the enquiries' coordinator of the Science Museum London (email 28.05.2019), where the objects used to be on display, they were transferred to the Petrie Museum at the University College London in 2005.

4 Petrie 1926: 18, pl. V.456, 458, pl. VI.646, pl. VIII.881, 883.

5 Rahmstorf 2007: 13–14; Petruso 1981: 44.

6 It would be worth going through the inventories of stone objects from early settlements like Hierakonpolis in order to identify weights from the crucial time span of the late Pre-Dynastic period.

7 Petrie 1926: 42; Petrie 1920: 29, pl. XLVI.36.

8 Cour-Marty 1990: 54, fig. 26.

9 Rahmstorf 2007: 14–16.

10 The term was introduced by Evans 1906: 348.

11 Hafford 2002: 505–506.

12 Squatted quadrupeds are usually made from bronze, duck-shaped weights often from stone, see Hafford 2002: 505.

13 Petruso 1981: 37, fn. 13 for further literature.

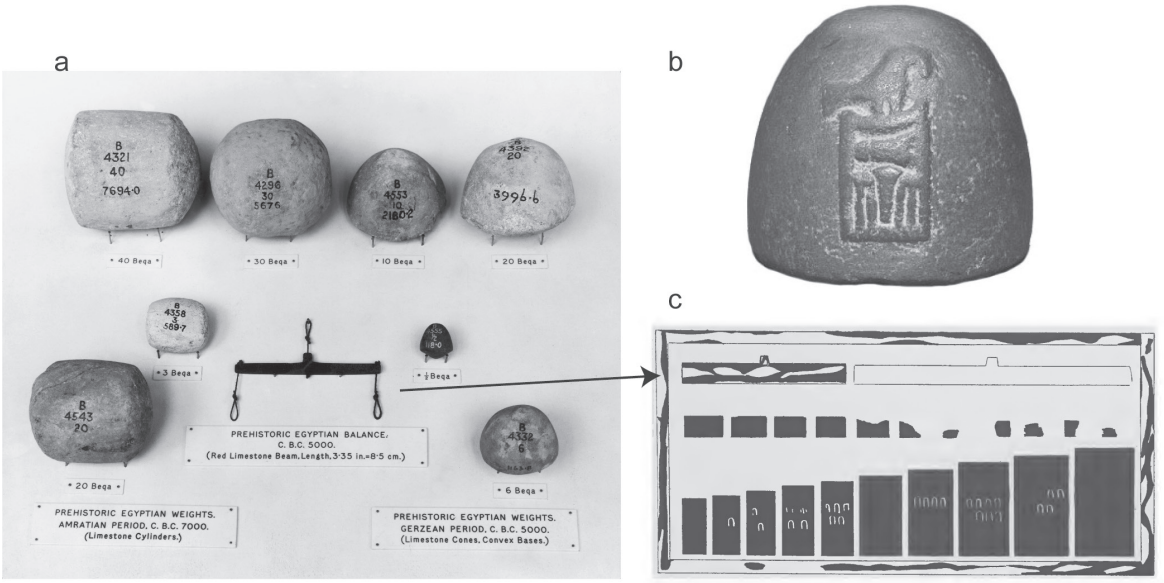


Fig. 1: *a Possible weights from Naqada tombs excavated by Petrie and an unprovenanced stone balance beam most likely dating to the earlier and mid 3rd millennium BC (courtesy of Science Museum London).*
b Possible weight inscribed with the name of King Narmer, 1770 g, SMÄK ÄS 5847 (after Büttner *2018: fig. 6).*
c Depiction of balance beams and weights in the tomb of Hesy-Ra (after Quibell *1913: fig. 5).*

pothesis that this fundamental change in Egypt can be linked to the rule of the so-called Hyksos kings. They gained control of the North of Egypt between c. 1640 and 1530 BCE as a result of the presence of a huge community of foreigners that migrated to the Eastern Delta already in the Late Middle Kingdom as traders and expedition leaders.[14]

2 Evidence from Tell el-Dabʿa/Avaris

Excavations in Tell el-Dabʿa/Avaris, the ancient capital of the Hyksos kings, located in the Eastern Delta of Egypt (Fig. 4), produced approximately 50 weights made of iron-rich sedimentary rocks, most likely hematite. Few examples occur already in the Middle Kingdom, but most of them can be dated to the Second Intermediate Period and the Early New Kingdom.[15]

One assemblage is derived from a richly furnished tomb in area A/I dating to the later Hyksos period (stratum D/3, Middle Bronze Age (MBA) IIB-C), according to the enclosed grave goods.[16]

Area A/I is the first area ever excavated in 1966–67 under the direction of Manfred Bietak and is located in the west of the still preserved part of the ancient tell (Fig. 5).[17] Its uppermost layers date to the Ptolemaic and Late Period,[18] and some remains of New Kingdom activity prove continued use of the site.[19]

14 Bietak 1997: 103.

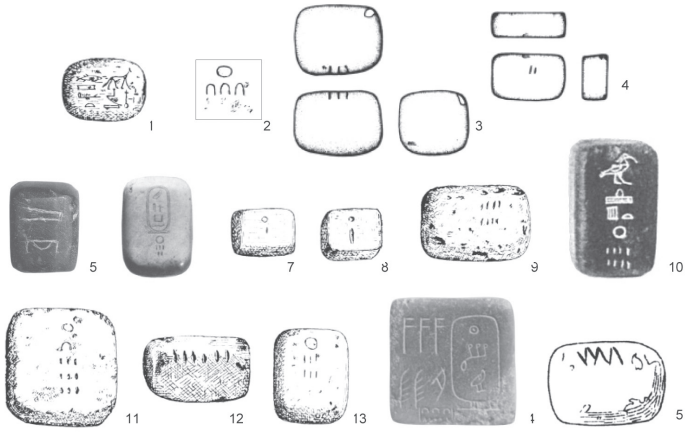
15 The publication of the remaining weights by the authors is in preparation.

16 For the stratigraphy of Tell el-Dabʿa see Bietak 2010: 140, fig. 1.

17 Bietak 1968: 81–102.

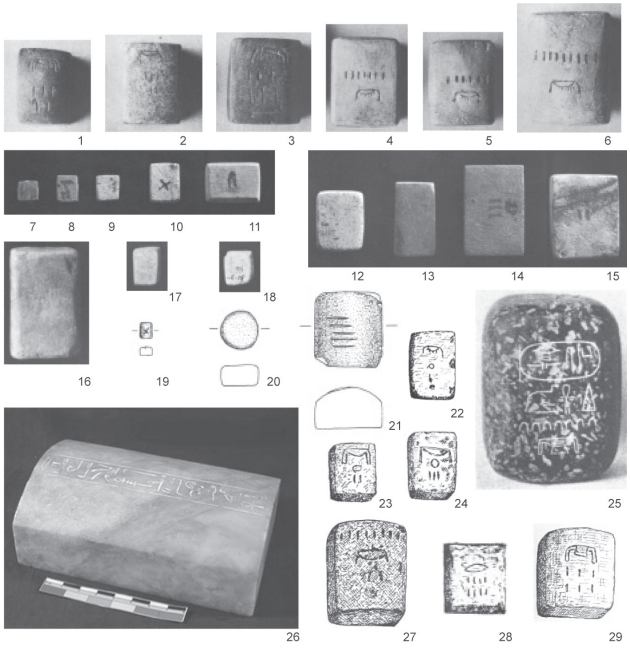
18 Lehmann 2012–13.

19 Bietak 1968: 103.



a 1-2, 7: Koptos
3-5: Elephantine
8: Defenneh
11-12: Memphis
13: Gurob
6, 10, 14: no provenance

Fig. 2a: Canonical Egyptian weights of the Old Kingdom (after Rahmstorf *2012: pl. 120).*



b 1-15: Uronarti
16-18: Shalfak
19-21: Elephantine
22-27: no provenance
28-20: Koptos

Fig. 2b: Canonical Egyptian weights of the Middle Kingdom (after Rahmstorf *2012: pl. 121).*

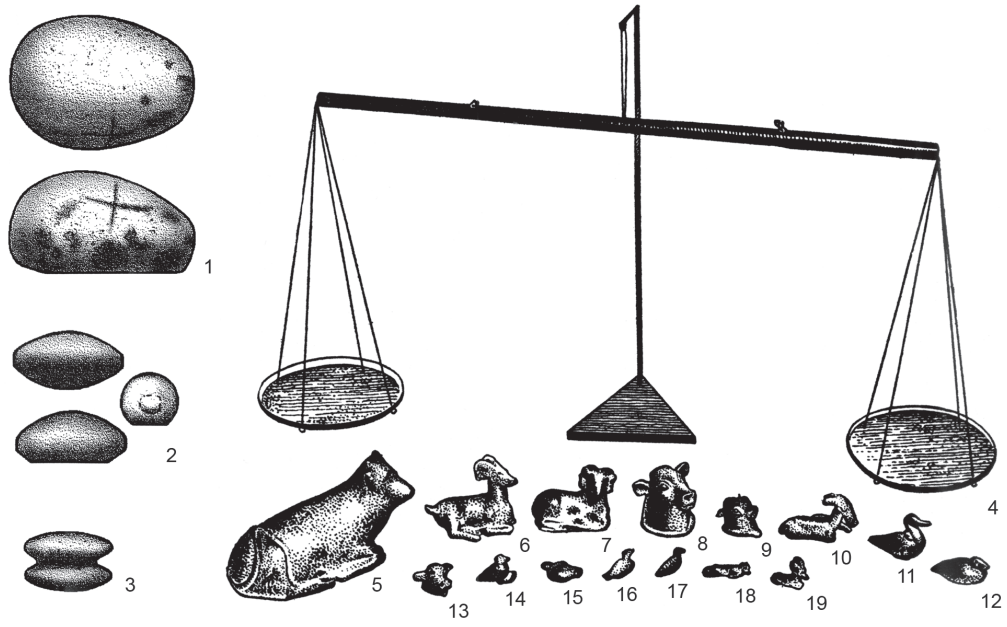


Fig. 3: Canonical Egyptian weights of the New Kingdom (after Rahmstorf *2012: pl. 122).*

Four grid squares were excavated to the depth of the layers of the Second Intermediate Period, revealing buildings and a small alley with tombs of children and adults located below the floors (Fig. 6).[20]

The disturbed Tomb 1 in square A/I-g/3.4 underneath a floor paved with mudbricks is a vaulted chamber tomb that was not entirely excavated due to the height of the surrounding sections. The tomb contained the remains of at least five scattered skeletons (Fig. 7). Several bronze items (daggers, axes, knives, toggle pins), scarabs and pottery vessels survived, which can only partially be assigned to certain individuals.[21]

This tomb is of special interest because it contains not only these still rich grave goods, but, also two sets of weights. One set was found in front of the no longer preserved torso of Burial 4. Unfortunately, no detailed photographs were taken or are still existing, but their exact location is marked on the field drawing (Fig. 7). It is reasonable to assume that they were once stored inside an organic container that had decayed within the soil.

The weights of the presumed second set were found scattered all over the tomb. One cylindrical weight was lying close to Burial 2 (Fig. 8) and probably belonged to this individual.

The first set comprises 11 objects (Fig. 9).[22] Three weights are apparently unworked pebbles, one is made of steatite, the others consist of iron-rich sedimentary rock – here taken to be hematite. Three of them are sphendonoid (Fig. 9: 462 a, b, k), two others, now broken, once had the same shape (Fig. 9: 462 c, f). The worn fractures sug-

20 See Prell/Rahmstorf 2019 for a presentation of all the tombs found in area A/I.

21 See Prell/Rahmstorf 2019 for a presentation of the complete inventory.

22 The authors are grateful to R. Hölzl and M. Hüttner from the "Kunsthistorisches Museum" in Vienna who provided access to the objects stored there.

Fig. 4: Location of Tell el-Dabʿa in Egypt's Eastern Delta (after Bietak *2018: 225, fig. 2).*

gest that they were recycled and kept in use. One weight is cylindrical (Fig. 9: 462 d), the shape of the other objects (Fig. 9: 462 e, g–i, l) seems to be random. One of the sphendonoid weights (Fig. 9: 462 k) bears four markings on the base, most likely indicating a certain weight unit.

The second group consists of seven objects – all made from hematite (Fig. 10). Two are again sphendonoid (Fig. 10: 379 a, b), another is cylindrical (Fig. 10: 379 c). The others (Fig. 10: 379 d–g) seem to have again an arbitrary natural shape. The random shapes demonstrate that even simple pebbles may have functioned as weights (see below for similar circumstances concerning weights found in a Late Bronze Age tomb in Akko).

Interestingly, whilst the tomb was plundered, relatively precious grave goods like daggers and axes, were left behind. The lower extremities of three of the five individuals interred here were found *in situ*, but all the torsos had been disturbed. This fact suggests that the grave robbers intended to remove precious metal objects worn on the torso and the head as has been confirmed by other burials in Tell el-Dabʿa.[23] The presence of weights suggests that the person using them was a merchant, equipped with his goods and

23 Philip 2006: 86–88, 109–114, 116–119.

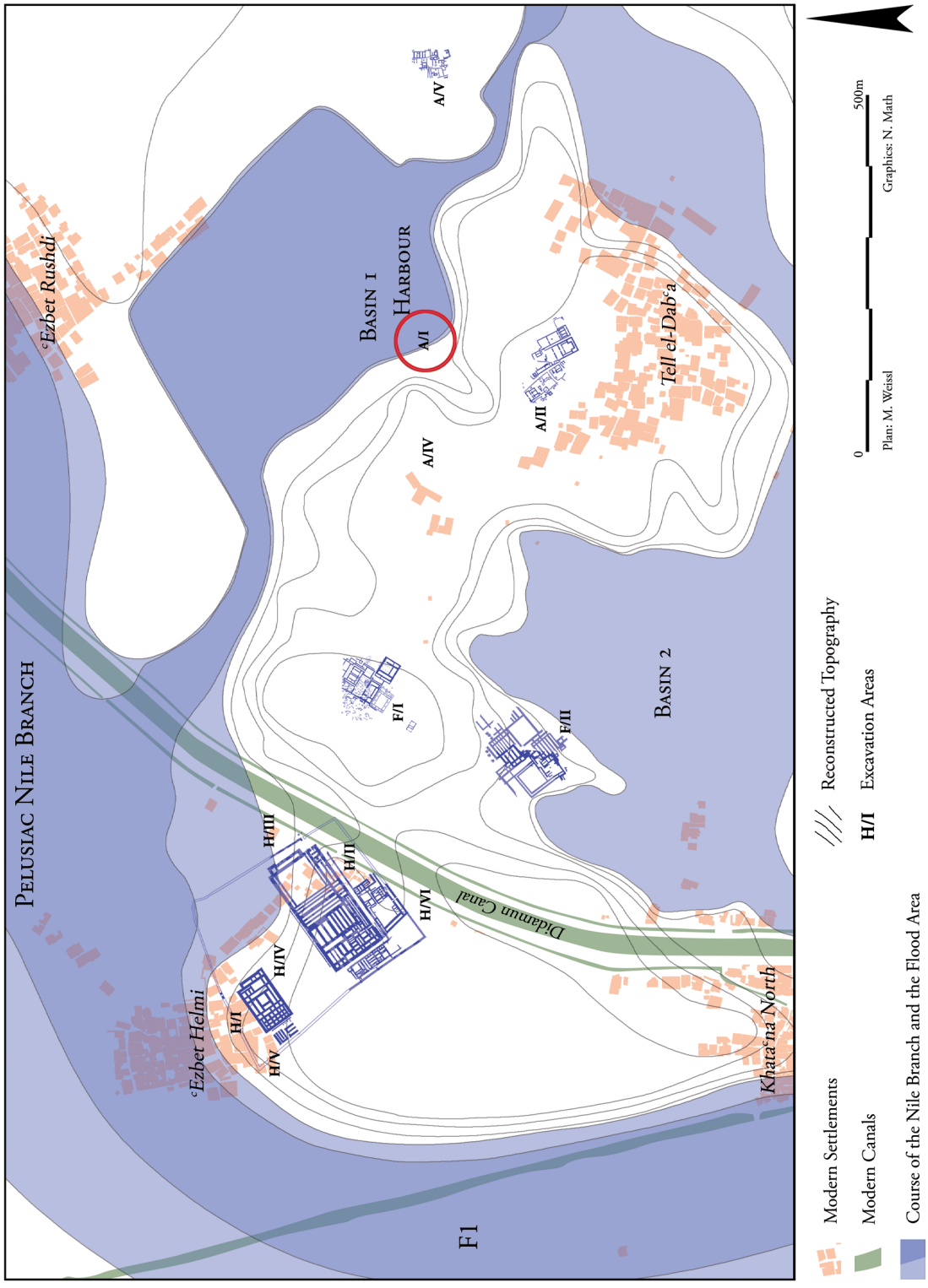


Fig. 5: Location of area A/I north of the modern village Tell el-Dabʿa with reconstruction of the ancient landscape (after Bietak *2018: 224, fig. 1).*

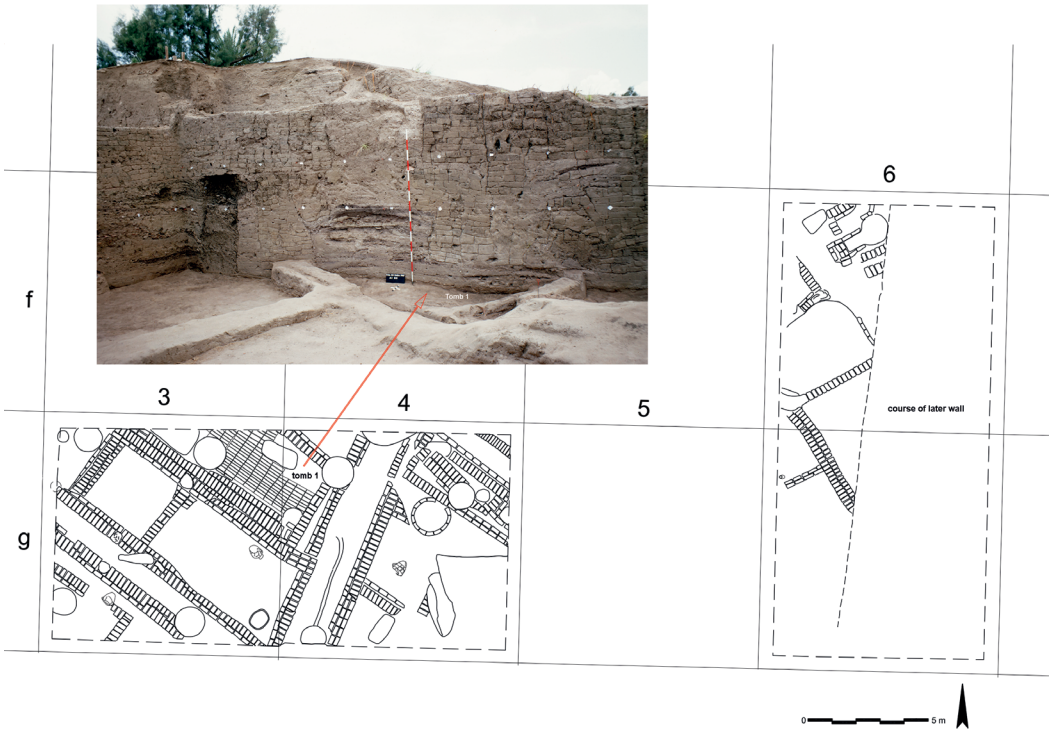


Fig. 6: The Second Intermediate Period layers as excavated in area A/I and the northern section of square A/I-g/3.4 with the location of tomb 1 indicated (plan: P. Aprent, photo: M. Bietak).

tools for the afterlife.[24] Unfortunately no remains of a scale could be identified among the grave inventory.[25] This is not uncommon: at Ur, for example, scales are present only in four of the 26 Early and Middle Bronze Age graves with weights.[26]

3 Weighing Equipment as Grave Inventory beyond Egypt

So far, no evidence for undoubted weights from graves from other Old or Middle Kingdom sites in Egypt is known to us. We would like to present here a short overview of weights in burials from Syro-Mesopotamia and the Levant but also the Aegean, Anatolia and the Gulf region during the Early and Middle Bronze Age. Generally, weights are rarely used as grave goods in the Early Bronze Age (Fig. 11). Seven examples are known from Early Dynastic tombs in Ur and

24 For the use of a balance scale and weights within the Hittite death rituals, see Otten 1958: 131–132. Weighing the heart of the deceased against the feather of Maat is a common theme in Egyptian funerary beliefs, but one cannot assume a coherent meaning for the Bronze Age contexts presented here.

25 Fragments of a metal sheet with bent egdes that might have represented a scale pan find a better preserved comparison in F/I-p/18, tomb 14 (Stratum d/1), see Schiestl 2008: 120, 453, pl. XXII.c. As this object is clearly only pierced on one side with two perforations next to each other, it cannot be addressed as scale pan, but maybe a belt plaque, see Prell 2019: 316–317; Bietak 1968: 102.

26 Hafford 2012: 48.

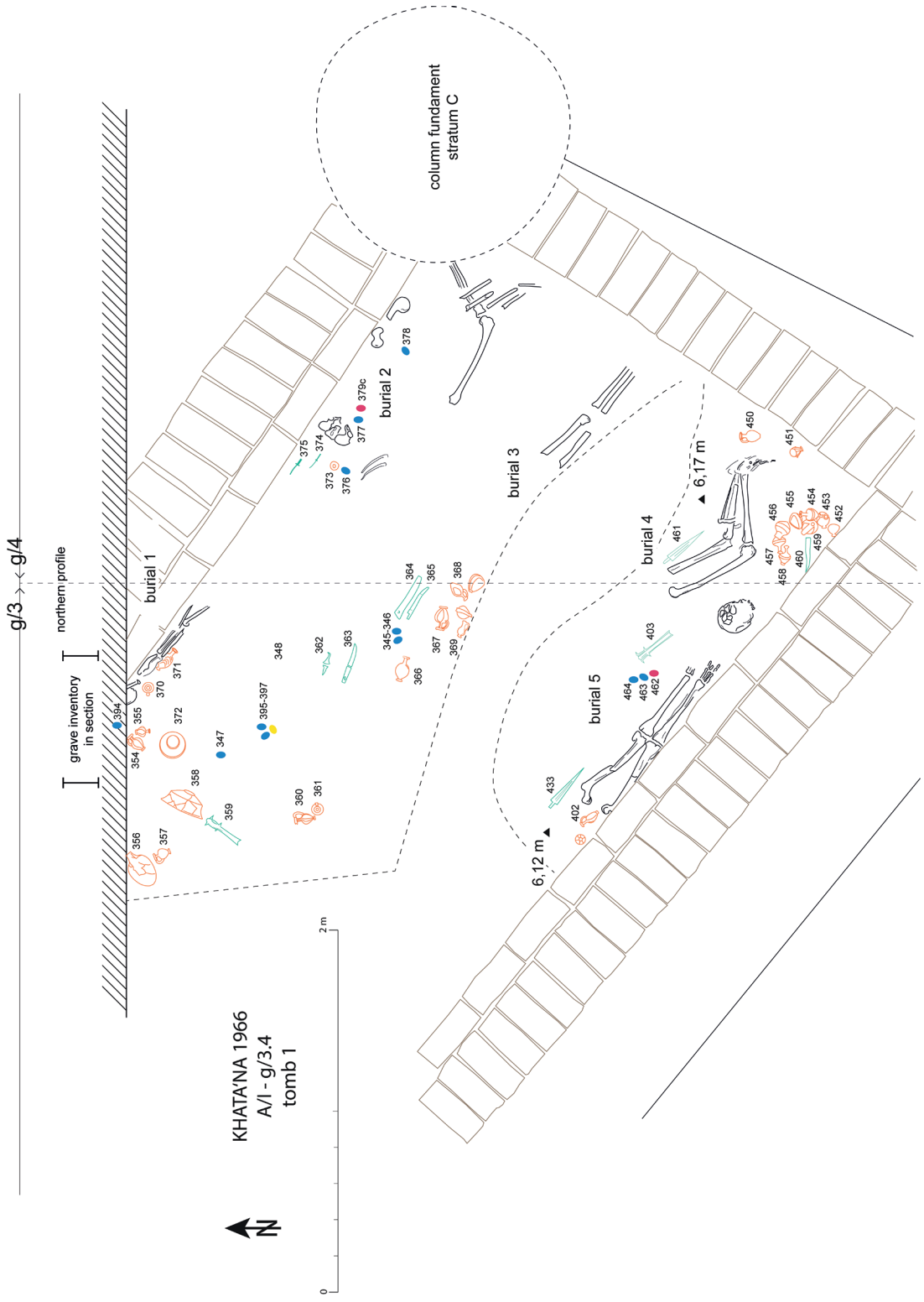


Fig. 7: A/I-g/3.4, tomb 1, burials 1–5 with grave inventory (green: metal, orange: pottery, blue: scarabs, red: weights, yellow: frog amulet, plan: P. Aprent).

five more from graves dating to the Akkadian Period.[27] A set of two scale-pans is documented in PG 1054.[28] Seven weights and a set of scale-pans were discovered in tomb IV at Tello/Girsu (Early Dynastic III).[29] Weights possibly dating to the late 3rd millennium are documented in two tombs in Susa and were accompanied by scale-pans.[30] Other weights are known from an intramural, most likely Akkadian, burial at Nippur[31], as well as from tomb 8 in Tell ed-Der.[32] Interestingly, some early spool-shaped objects, most likely representing weights in this region, have also been found in Aegean tombs (for example: Steno/Lefkas,[33] Aghios Kosmas in Attica,[34] Chalandriani/Syros,[35] Kapros/Amorgos[36] and Archanes/Crete).[37]

Weights as grave goods became more common in the Middle Bronze Age (Fig. 11), but not in large numbers. We list here some but very probably not all known specimens. In the Isin Larsa/Old Babylonian Period from Ur 14 intramural tombs with weights are known.[38] Two of them (LG/23 and LG/45) also contained the remains of scales.[39] A further two weights and a set of scale-pans were found in tomb LG/170.[40] In Tell ed-Der, weights came to light in tomb 62.[41] The deceased in the Old Babylonian tomb 45 in Uruk was provided with a set of seven weights.[42] A lion weight is known from a grave in Susa, dating to the beginning of the 2nd millennium BCE.[43] A jar found in Larsa filled with scrap metal, seals and numerous weights[44] is addressed as a tomb.[45] In Kültepe-Kanesh in south-central Anatolia weights were included as grave goods in several burials dating c. to the 19th century BCE. Some of the graves also contained the remains of bronze scale-pans.[46]

The context of tomb 1974 in Tell el-Ajjul in the southern Levant remains unclear. It can be dated only to the Middle to Late Bronze Age,[47] therefore the precise date of the included weight remains uncertain. One late Middle Helladic grave at Lerna in the Argolid in Greece also yielded a spool-shaped weight.[48]

27 Ialongo/Vacca/Peyronel 2018: 22; Hafford 2012: 48–49, table 9. See as well Woolley 1934: 473 (PG 1413).

28 Müller-Karpe 1993: 13; Woolley 1934: 105, fig. 17, 107.

29 De Genouillac 1936: 31, 95, 122, pl. 88.1.

30 Tallon 1987: 194, nos. 684–685.

31 A simple earth burial with few funerary gifts in area TB XI, tomb no. 3B 68, see McCown/Haines 1967: 144.

32 Boehmer/Pedde/Salje 1995, 19. Ratnagar 2003: 88 also mentions weights in a tomb in Hili (Abu Dhabi) and Shahdad (Iran), but gives no references and in the publications of this tomb/the cemetery no weights could be identified by the present authors. A lot of 13 weights found at Mari in an area that contained tombs and sometimes mentioned as coming from a funerary context (e.g. Chambon 2006: 188) actually could not be attributed to a certain tomb, see Margueron 2019.

33 Dörpfeld 1927: 297–298.

34 Mylonas 1959: 87, 99, fig. 166.8–11.

35 Tsountas 1899: 100, 111, 122, pl. X.35–36.

36 Rambach 2000: 13 f., pl. 3.4, pl. 155.9.

37 Sakellarakis/Sapouna-Sakellarakis 1997: 64–65, 582, fig. 594. See as well Rahmstorf 2003.

38 Ialongo/Vacca/Peyronel 2018: 22; Hafford 2012: 48–49, table 9.

39 Peyronel 2000; Ascalone/Peyronel 1999: 368, fn. 40.

40 Peyronel 2011: 124; Woolley/Mallowan 1976: 210.

41 De Meyer 1978: pls. 16, 17.4–5.

42 Boehmer/Pedde/Salje 1995: 19, 21.

43 Belaiew 1934: 135, fig. 1 A16, no. 177.

44 Arnaud/Calvet/Huot 1979.

45 Boehmer/Pedde/Salje 1995: 19, fn. 8 with reference to the article of Arnaud/Calvet/Huot 1976.

46 Kulakoğlu 2017: table 21.3.

47 Petrie/Mackay/Murray 1952: pls. XXII.3, XXIII.5. Date according to Laidlaw/Ucko/Sparks 2009: 89, no. 77.

48 Rahmstorf 2003: 297; Banks 1967: 193, 195, no. 366.

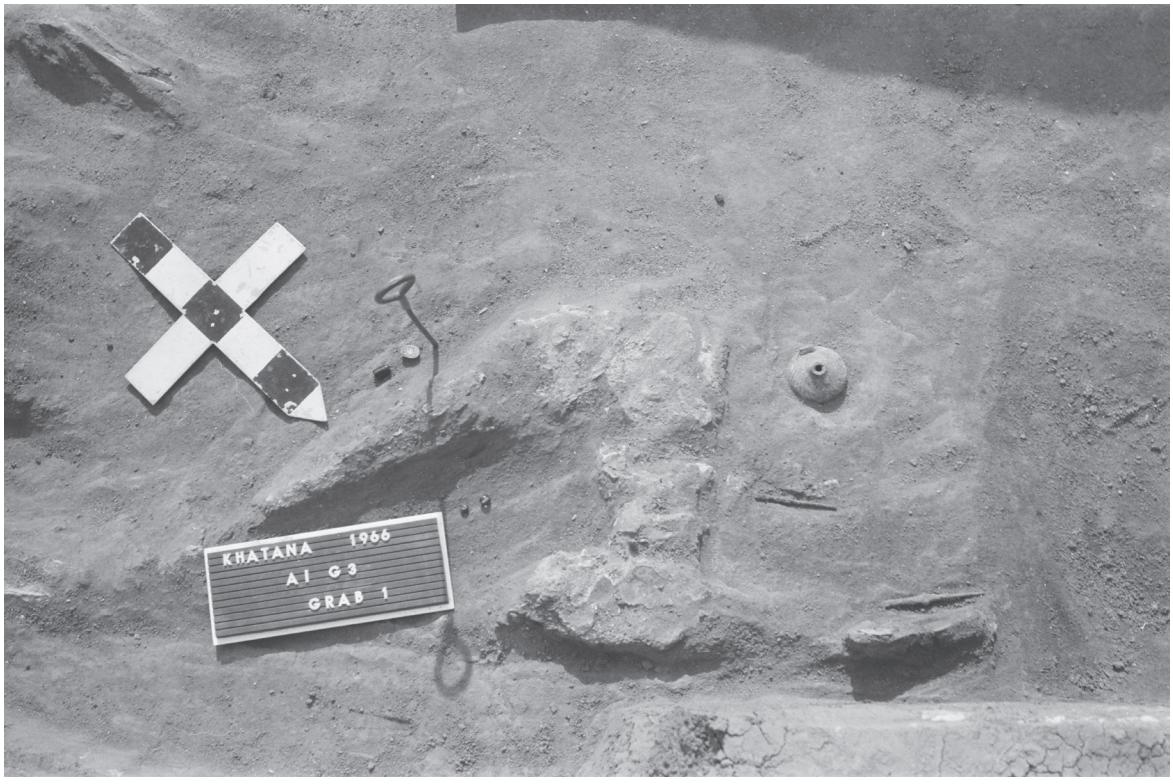


Fig. 8: Detail of A/I-g/3.4, tomb 1, burial 2 including weight inv.-no. 379c (photo: M. Bietak).

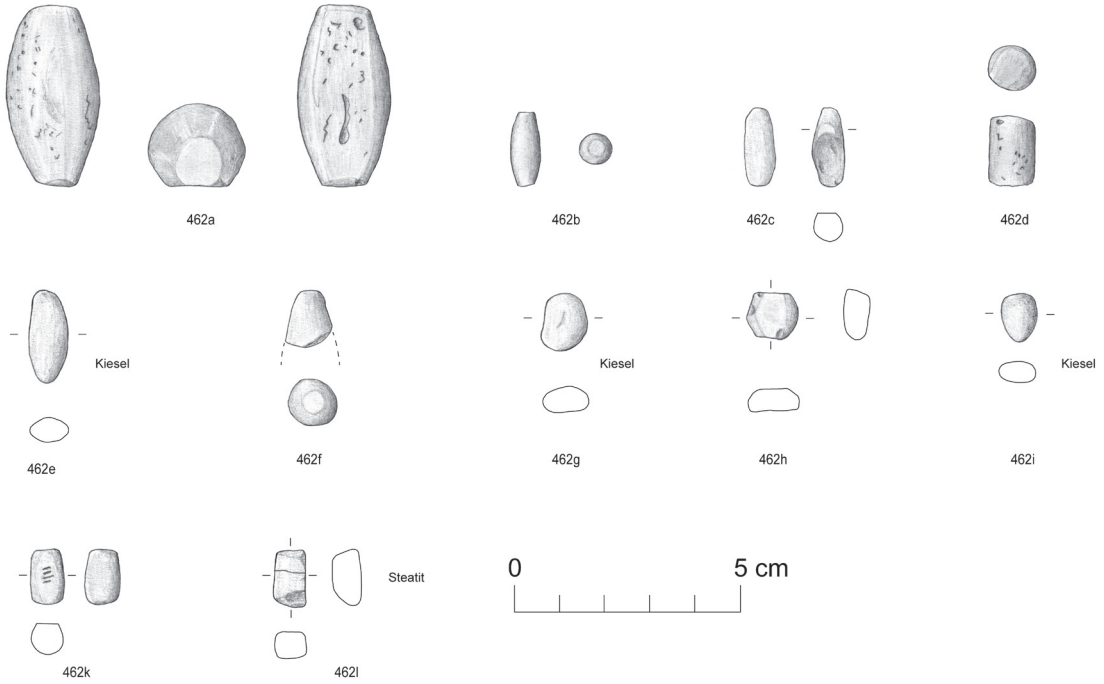


Fig. 9: Set of weights (inv.-no. 462a-l) found with A/I-g/3.4, tomb 1, burial 4 (drawing: S. Prell).

A couple of sites from the latest Early and the beginning of the Middle Bronze Age in the Gulf region also comprise burials with weighing equipment. We know of eight hematite weights found together with the remains of a metal scale in a late Early Dilmun Period burial mound S 352 at Saar in Bahrein.[49] In addition, four sphendonoid weights and two duck-shaped weights were excavated in Saar, Tumulus 4[50] and a set of four sphendonoid weights in an unspecified grave at all-Hajjar, Site 2 in Bahrain.[51] Further weights from funerary contexts have been discovered on the Omani Peninsula. The cubical weight from Tomb 6 in Shimal seems to correspond to the Harappan weight unit,[52] thus underlining trade relations between the Gulf region and the Indus Valley Civilisation during the late third and early second millennium BCE. A second spherical weight with a flat base was found in tomb 99 at Shimal. Its shape and weight (25.71 g, slightly chipped = c. two Harappan units of 13.7 g) also point to the Indus region.[53] Sphendonoid and cubical weights known from the Arabian Peninsula illustrate the role of the region as an intermediator between the West and the East.[54]

In the Late Bronze Age, providing the deceased with weighing equipment became slightly more common, but still not frequent.[55] Some weights from tombs in Akko, although dating to the developed Late Bronze Age, need mentioning because they display certain similarities with the presented data from late Middle Bronze Age Tell el-Dabʿa finds. During a rescue excavation near the "Persian Garden", several burials were discovered, five of which were undisturbed.[56] They

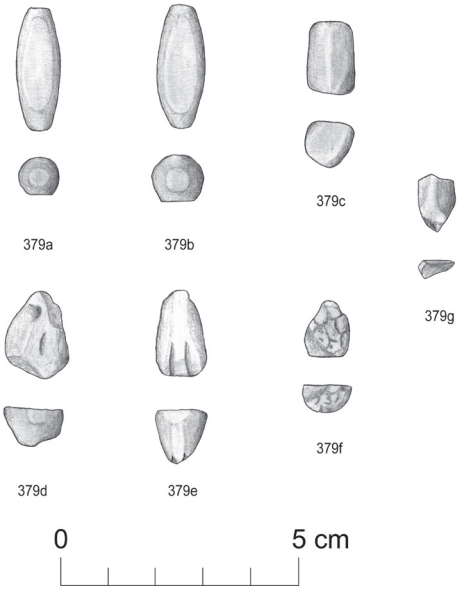


Fig. 10: Weights (inv.-no. 379a-g) found scattered all over the tomb (drawing: S. Prell)

49 Peyronel 2000: 185, fn. 29; Ascalone/Peyronel 1999: 368–369. Their weights correspond to 1/8, 1/2, 2/3, 1, 2, 3, 5, and 10 *shekels*, see Mortensen 1994: 396. For a photo of seven of the weights, see Vine 1993: 47, fig. on the upper right; according to the captions they follow the Mesopotamian *shekel* (c. 8.3 g).

50 Lombard 1999: 99, nos. 100–105.

51 Ascalone/Peyronel 1999: 369 (26.3 g, slightly chipped); Lombard/Kervran 1989: 35, no. 56.

52 Ascalone/Peyronel 1999: 370.

53 Cleuziou/Vogt 1985: 272.

54 See as well Peyronel 2000: 185, fn. 29.

55 See Steinmann 2012: 282, fn. 78 for a list of Aegean tombs containing parts of scales and sometimes as well lead weights; see as well Alberti 2006; 2003 and Bergonzi 1996. For Late Helladic graves containing spool-shaped weights, see Rahmstorf 2003: 297. A Late Cypriote grave in Hala Sultan Tekke provided a set of nine weights, see Fischer/Bürge 2018: 58, fig. 25. For a Late Bronze Age tomb containing two sets of scale-pans in Megiddo (T 912 B), see Guy 1938: pl. 125.6–9; Susa: Belaiew 1934: 136, fig. II.C–6; Tell Jerishe: Ory 1944: 55–57, pl. 13.4.

56 Ben-Arieh/Edelstein 1977: 2.

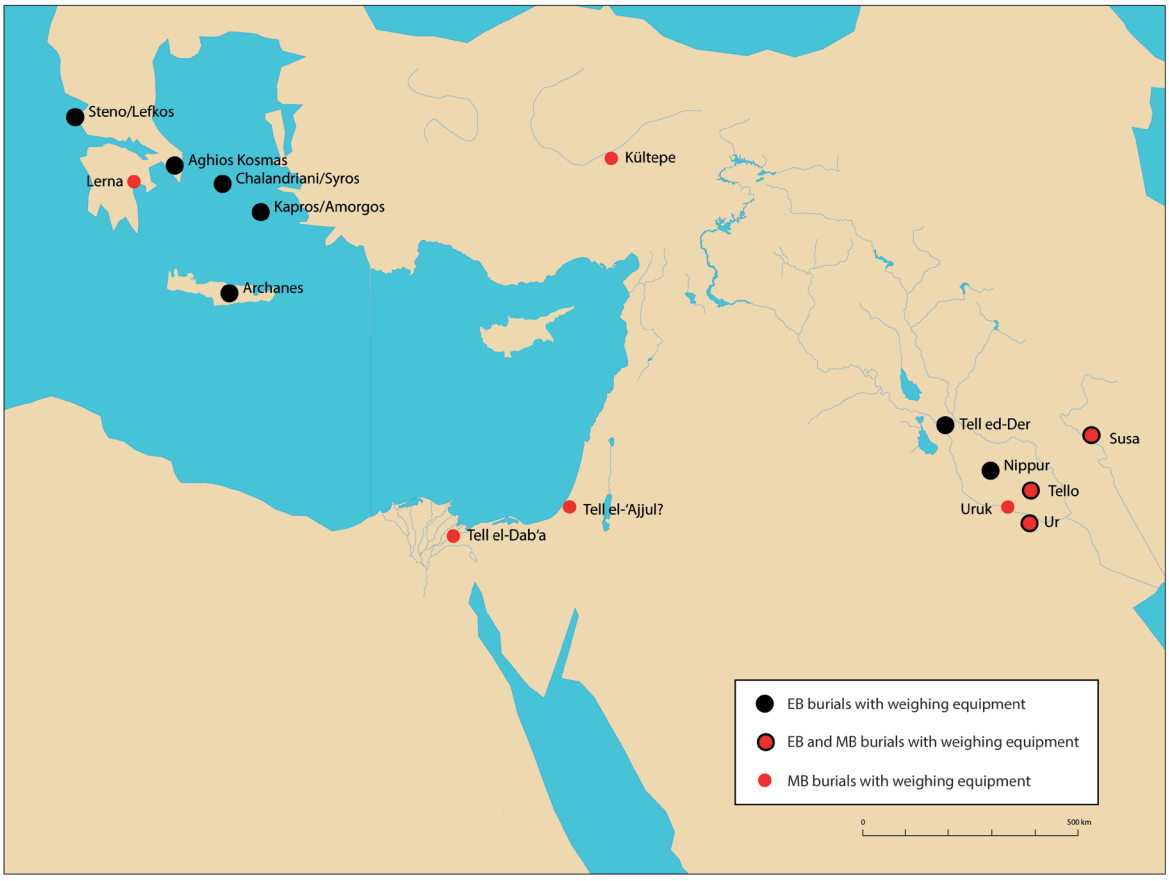


Fig. 11: Tombs including weighing equipment in the Early and Middle Bronze Age (plot: S. Prell).

consisted of simple earth pits and in three tombs (A2, B3, and C1) weights were found amongst the relatively rich grave goods including weapons. Weights were often found concentrated near the feet, the hip or the head of the deceased. This suggests that sets were once stored in a bag of organic material. Hematite weights and animal-shaped metal weights were also recovered. Interestingly, some simple stones, partly worked to achieve a certain weight, were included in those sets[57]– comparable to the simple pebbles and broken but re-shaped weights from tomb 1 in A/I-g/3.4 in Tell el-Dab'a. Weighing equipment was also occasionally still part of the grave goods assemblage in the Iron Age.[58]

57 Eran/Edelstein 1977: 52.

58 E.g. a scale-pan in tomb GVIII 111 in Hama, see Riis 1948: 136, fig. 181; scale pans were also included in the Neo-Assyrian tomb 1B209 in Nippur, see Hauptmann/Pernicka 2004: 31, pl. 40.681–682 or in two Neo-Babylonian tombs in Uruk, see van Ess/Pedde 1992: 55, pls. 54–55. In addition, a scale-pan is also known from an Iron Age tomb (T 39) in Megiddo, see Harrison 2004: 91, pl. 33.4.

4 Conclusions

Weights and balances have been used from the Aegean in the west to the Indus region in the east, since at least the earlier third millennium BCE. Four main types have been developed independently in the various regions: spools, sphendonoids, parallel-epipeds and cubes (Fig. 12).[59] The overlap in the distribution of the different shapes and their metrological systems are indicative of exchange.[60] For our discussion it is important to note that sphendonoid/ellipsoid shape (green symbol) and the materials hematite and other dark stone were used for weights from western Anatolia into Syro-Mesopotamia (with a few examples in the mature Harappan culture[61]) from the Early Bronze Age. Among other weight units the so-called 'Syrian, Levantine or Ugarit *shekel*' of c. 9.1–9.4 g was in use in Syria (e. g. Ebla[62]) and the Aegean since the Early Bronze Age.[63] In Egypt the parallel-epipeds were the dominant type during the Old and Middle Kingdom.[64] Their metrological system was vastly different to the ones in Anatolia and Syro-Mesopotamia where statistical tests (Cosine Quantogram Analysis) of 103 Middle Bronze Age weights from Ebla demonstrates the continuous use of weight units known since the third millennium BCE.[65] Most prominent were the Mesopotamian *shekel* 8.3–8.4 g (especially well documented at Kültepe/Karum Kanesh[66]) and the *shekel* of 9.1–9.4 g.

With the Late Bronze Age the characteristics of weights (shape, material, metrology) in Anatolia, Syria/Levant, and then also on Cyprus, remained similar. The most dominant unit was still the *shekel* of 9.1–9.4 g and ten times this unit (c. 91–94 g) as documented by the set of 150 weights found in the shipwreck of Uluburun.[67] By then, Egypt participated in the international exchange in the East Mediterranean in a much more intensive way than previously and adopted the typical shapes, the characteristic dark stone material and the specific metrology of the other Eastern Mediterranean countries. The weights from Tell el-Dab'a demonstrate this rather clearly: the unit of c. 9.1–9.4 g and also the Mesopotamian *shekel* (c. 8.3–8.4 g) were used.[68] For example, the four parallel grooves on inv.-no. 462k (Fig. 9, Tab. 1), which weighs 2.05 g, seem to refer to the Mesopotamian *shekel* of c. 8.3–8.4 g. This unification with other regions of the eastern Mediterranean facilitated trade in general and is indicative of the stronger engagement of Egypt during the New Kingdom in the exchange in the Eastern Mediterranean and beyond.

Considering the evidence presented, the most likely hypothesis is that the changes in the weighing equipment and the related weighing system were established in Egypt by the Hyksos, who originally hailed from the middle and northern part of the eastern Mediterranean. Our case study contributes to the understanding of the time of the Hyksos as a period in which suppos-

59 Rahmstorf 2007 for an overview of forms and regions.

60 Rahmstorf 2007: 30–38.

61 Rahmstorf 2020.

62 On the weights from Ebla see as well Ascalone/Peyronel 2006.

63 Rahmstorf 2007: 21–22.

64 Cour-Marty 1990: 54–55, fig. 26.

65 See for the method: Petruso 1992: 71–75; Pakkanen 2012; Ialongo/Vacca/Peyronel 2018: 24.

66 For the simultaneous use of different weight systems in Kültepe see Dercksen 2016.

67 Pulak 2000.

68 See Rahmstorf 2007: 11–12 for the difficulty in assigning a specific weight unit with certainty.

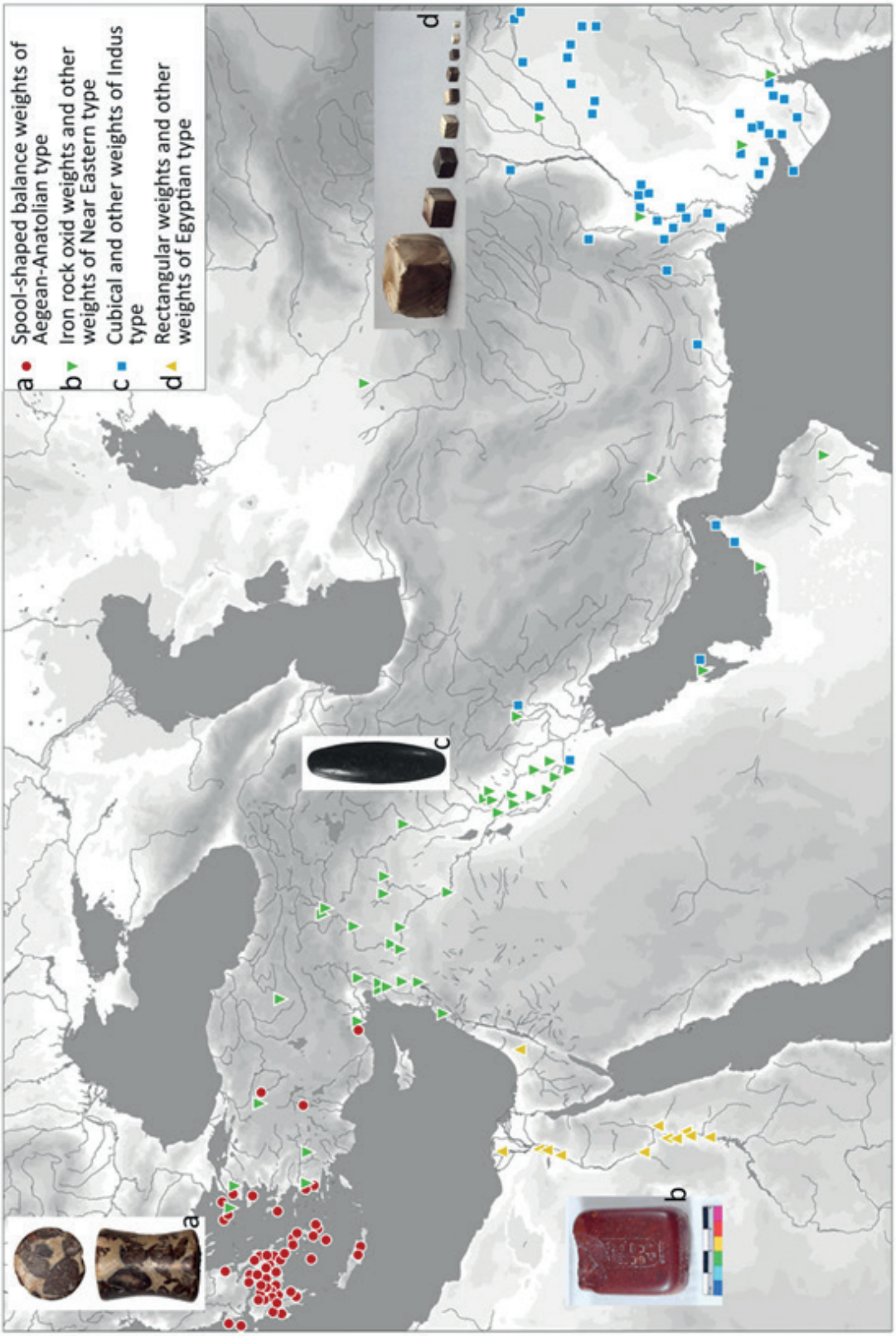


Fig. 12: Distribution of sites with weights in the third millennium BCE and the main (canonical) weight types (after Ramstorf *2016: 30, fig. 3)*

edly many militaristic and technological innovations reached Egypt from the east, as it has been assumed by numerous scholars.[69] Such lists of innovations often comprise the horse, the chariot or the composite bow, but in fact definite evidence that the Hyksos were indeed responsible for the introduction of all these novelties is not always conclusive. For example, no artefacts related to chariots or composite bows were ever discovered in Tell el-Dabʿa, a fact which may be explained by the soil conditions in the Egyptian Delta which do not allow the preservation of organic material. Yet, we have proof that the earliest horse remains[70] and the earliest known scimitar so far[71] – a very common weapon in Egypt during the New Kingdom – derive from the site. Technological achievements, like the fast turning potters' wheel[72] or metallurgical innovations are however difficult to pinpoint as innovations brought to Egypt by the Hyksos.[73] Nevertheless, it is certain that the Hyksos' rule over the country had a considerable impact on Egypt and generally resulted in the introduction of innovations. It should be noted that these consisted not only of militaristic and technological appliances, but also of tools for trade as the weights from Tell el-Dabʿa presented here seem to suggest.

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69 See Säve-Söderbergh 1951; Schulman 1980; Shaw 2001: 59–71 or Booth 2005: 36–46, just to name a few.

70 Bietak/Forstner-Müller 2009: 88, fig. 8 for a complete skeleton that can be dated to the 15th Dynasty. Earlier horse bones can be attributed to a late 13th Dynasty context, see Boessneck/von den Driesch 1992: 22, 25.

71 Forstner-Müller 2008: 51.

72 There are indications though that the fast turning wheel was brought to Egypt in the Second Intermediate Period, see Aston 2004: 51.

73 For a complete overview of the subject, the cultural interference and the impact of the Hyksos rule on Egypt, covering religious, technological and militaristic as well as political and social aspects, see Mourad, forthcoming.

Table 1: Potential ratios of the weights found in tomb 1 area A/I-g/3.4

inv.-no.	weight in gram	potential ratio	result
462a	44.90	5	8.98
462b	2.65	1/3	7.95
462c	1.65	1/6	9.36
462d	4.94	½	9.88
462e	1.45	1/6	8.7
462f	2.97	1/3	8.91
462g	1.25	1/8	10
462h	1.76	1/5?; 1/6?	8.8; 10.56
462i	0.70	1/12	8.4
462k	2.05	1/4	8.2
462l	1.11	1/8	8.88
379a	8.83	1	8.83
379b	5.06	2/3?; ½?	7.59?; 10.12?
379c	3.75	½?; 1/3?	7.5?; 11.25?
379d	4.6	1/2	9.2
379e	5.19	1/2	10.38
379f	1.42	1/6	8.52
379g	0.85	1/10	8.5

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Fragments of a Ramesside Coffin Ensemble: What Information Can Be Gained?

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When excavating in elite necropoli, archaeologists are often confronted with large amounts of fragmentary and incomplete material due to earlier looting activities. Theban Tomb 95 in the Sheikh Abd'el-Qurna necropolis is no exception to this. In addition to various object categories, more than approximately five thousand wooden, as well as several hundred cartonnage, fragments came to light. Since the Spring of 2013, the present writer has been documenting and studying all the fragments belonging to wooden coffins, chests, and mummy-masks. Grouping of objects was achieved through observation of the material, manufacture, and epigraphy. In 2017 and 2018, samples of different wood types, of various pigments and pastes, as well as of varnishes were taken. This paper focuses on fragments belonging to two coffin ensembles probably dating to the later 18th and 19th Dynasties respectively. The Ramesside ensemble consists of a two-piece open-work mummy-board and an inner wooden coffin. Only a very small percentage of the ensemble is preserved, and its fragments were found dispersed throughout all three parts of the tomb. The fragments dating to the earlier ensemble are even fewer, and the wooden fragments might suggest an allocation to a rectangular outer coffin, while the cartonnage fragments mainly stem from the back lappet of a mummy-mask. The present two case studies discuss the different documentation and research steps that archaeological investigations of severely damaged and commingled remains of burials require and shows how much information can be gained from very fragmentary material.

1 General Information on TT 95

TT 95 is a New Kingdom elite tomb, located on the south-western slope of the hills of Sheikh 'Abd el-Qurna in the Theban necropolis.[1] The rock-cut tomb was built for Mery, a high priest of Amun, and his mother Hunay, a royal nurse of Amenhotep II.[2] Besides the tomb chapel TT 95A, the tomb was extended by two monumental sloping passages, substructures TT 95B and TT 95C (Fig. 1).[3] Although the burial chambers situated within substructure TT 95B were thoroughly looted over the millennia, inscribed vessels found therein mention the titles and names of Mery's closest female relatives, his mother Hunay, and his wife Myt.[4] Additionally frag-

1 Gnirs/Grothe/Guksch 1997: 61.

2 Gnirs/Grothe/Guksch 1997: 66–67.

3 Loprieno-Gnirs 2021: Chapter I (in press).

4 Gnirs/Grothe/Guksch 1997: 67–68; Loprieno-Gnirs 2021: subchapter VIII.1 (in press); https://lhtt.philhist.unibas.ch.

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ments of at least three New Kingdom coffins of the black type, as well as two mummy-masks with blue and yellow striped wigs were found in Chamber 1 of the sloping passage TT 95B.[5] TT 95B was reused during the Third Intermediate Period since fragments of coffins dating from the 21st to the 25th Dynasties were found mainly in Chambers 2 to 4.

By contrast, substructure TT 95C might have been built at a later stage and was left unfinished.[6] Fragments of two New Kingdom coffins of the black type were also found here. Additionally, fragments of coffins of the yellow type and remains of two mummy-masks were discovered mainly in Chamber 4 of this substructure, at the very end of the sloping passage. Besides the New Kingdom material, fragments of various coffins and chests dating from the 22nd Dynasty to the Late Period were also found here. Like many other tombs in this necropolis, TT 95 was looted on numerous occasions.[7] During the various phases of looting, objects were destroyed, and broken pieces were dispersed everywhere in the tomb complex, i.e., in the two substructures and the tomb chapel, or had even been completely removed from the tomb.[8]

2 Methodology

Excavations and epigraphic recording in TT 95 started in 1991 and were led by the present project coordinator and field director, Andrea Loprieno-Gnirs, on behalf of the German Archaeological Institute (DAI).[9] Between 2001 and 2014, the project continued as a joint venture between the DAI and the University of Basel, Switzerland, until, in 2014, the tomb concession was transferred to the University of Basel alone. In 2015, TT 95 along with TT 84, K85, K90, K453 and K555, was integrated into a larger project, focusing on the 'Life Histories of Theban Tombs' (LHTT).[10] Since the beginning of the excavations in TT 95, a large number of wooden fragments came to light and more fragments were eventually discovered in all three substructures of the tomb as well as in the forecourt. Some of the fragments with well-preserved decoration and inscriptions were treated as individual object finds and received a F(ind-)N(umber) such as FN301, as indeed was done with diagnostic objects in all find categories.

2.1 Documentation and Numbering of the Wooden Material

When it became clear that the diagnostic pieces of wood reached an amount of a little more than two thousand, coming from mixed contexts, the documentation process was changed, inscribing each fragment with a W(ood) number (e.g., W131). In addition, fragments with a similar use of materials (wood types, pastes, pigments, glues, and varnishes), a similar decoration scheme or epigraphy, were assembled into groups, of which each item received a CO-number (for 'coffin', e.g., CO7). Only in a very few instances, joining fragments were found. Individual coffin numbers (e.g., CO7.1) were appended to those fragments that not only represented the same cof-

5 Loprieno-Gnirs 2021: Chapter IX (in press).

6 Loprieno-Gnirs 2021: Chapter I (in press).

7 See e.g., Aston 2020.

8 Loprieno-Gnirs 2021: Chapter IX (in press).

9 See e.g., Gnirs 1995 and Gnirs/Grothe/Guksch 1997.

10 For more information on the LHTT Project visit the project's webpage https://lhtt.philhist.unibas.ch and see the forthcoming publication Loprieno-Gnirs 2021 (in press).

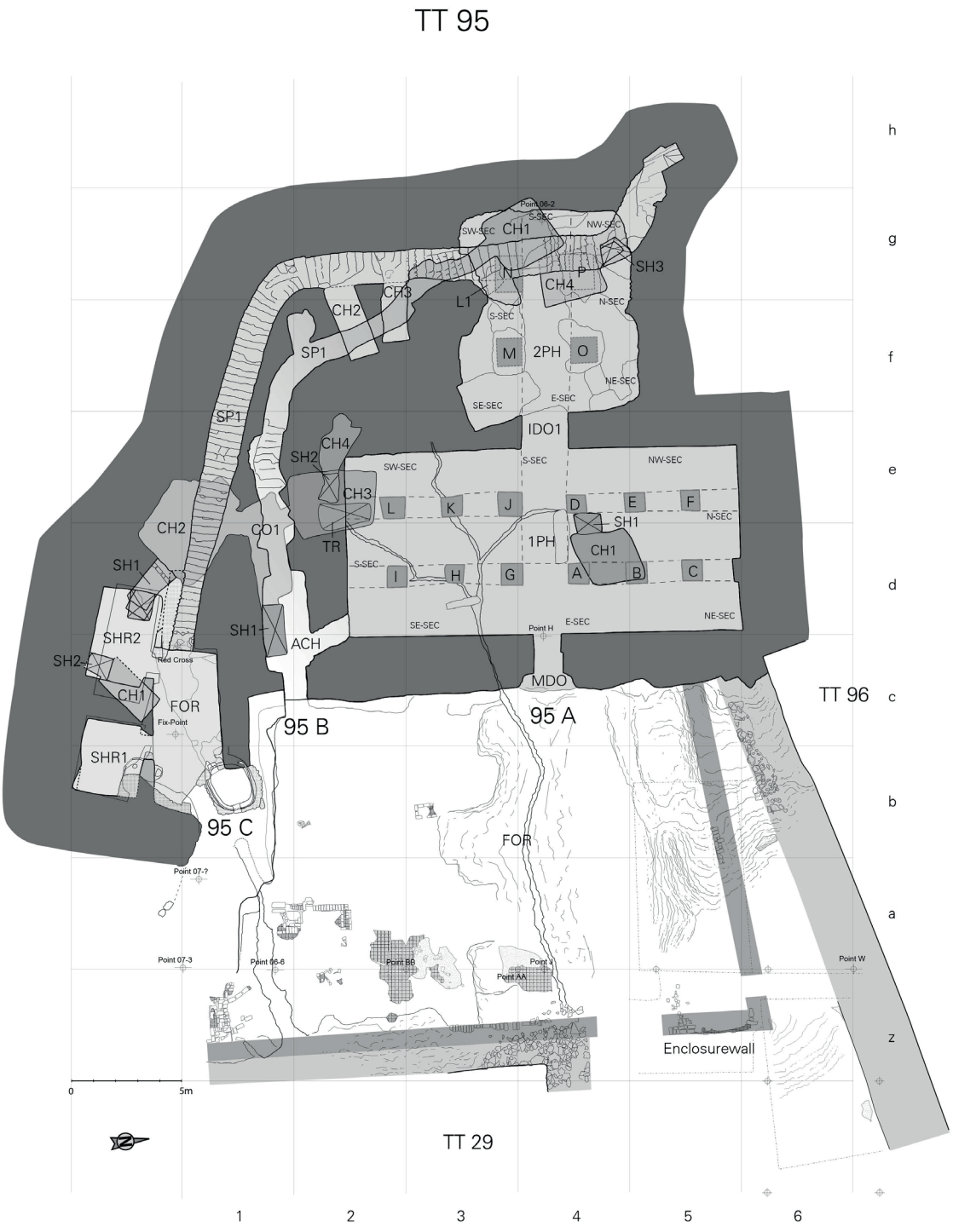

Fig. 1: Plan of TT 95 with the three substructures TT 95A, TT 95B and TT 95C. Key: 1PH: First Pillared Hall; 2PH: Second Pillared Hall; ACH: Antechamber; CH: Chamber; CO: Corridor; FOR: Forecourt; IDO: Inner Doorway; L: Loculus; MDO: Main Doorway; SHR: Shaftroom (© University of Basel, LHTT-Project, plan derived from 3D models based on terrestrial laser scanning; 3D models: E. Friedli, Z. Gojcic 2017; orthographic projections: S. Unter 2018; visualisation: M. Aeschlimann-Langer 2019).

fin type but seemed to come from a single coffin. The first detailed study of the wooden fragments was undertaken by Andrea Loprieno-Gnirs, but since 2013 the present writer has been working on this wooden material. Besides the coffin pieces, there are also parts of wooden chests and boxes, which were numbered along the same lines. Individual fragments of cartonnage mummy-masks were numbered according to the cartonnage material with a C-number (C for 'cartonnage', e.g., C900) and received a MASK number if pieces could be grouped together (e.g., MASK2). In the beginning, each individual fragment was documented on a find-sheet and, since 2017, the description of the fragment was entered into the project's database. These object-entries resulted each in an additional database number. To facilitate the overview of fragments of different object categories and for consistency, these numbers received the prefix LHTT and are used in all the project's publications (e.g., LHTT2186 for the fragment W131). Since there are more than two thousand fragments, the database entries are still ongoing, and a focus has so far been put on groups from specific burial contexts now prepared for publication.

2.2 Analytical Procedures

All the fragments were studied (1) individually, (2) within their groups, and (3) compared to intact objects from museums and publications. This process provided three different sets of information: firstly, a special wood working or decoration scheme, for example, may become apparent solely in one fragment, whereas it is easily overlooked when the group is studied as a whole. Secondly, the examination of fragments forming a group can provide a more precise picture of the object to which they once belonged, and thus facilitate the search for appropriate comparative examples. And thirdly, the study of completely preserved objects provides the basic information on coffin, mummy-board or mask types relevant to the investigated find material.

These comparative studies help to enhance the visual perception of features present in the given samples and thus (1) provide a more precise observation enabling a better understanding of the choice of materials and manufacturing techniques; (2) see fragmentary decoration as part of a complete decoration scheme and – in some instances – relocate the fragments within the coffin; and (3) analyse textual remains, which might provide further information on the coffin type, dating, or social background of the deceased.

The procedure of studying the individual fragments, the groups, and the comparative material was repeated with every new observation and, naturally, the order of the research steps could vary. Additionally, exchange of results with colleagues and specialists enhanced the research progress and added to the understanding of the fragments.

2.3 Limitations

The research procedure described here requires studies with the naked eye under very good light conditions, the use of a microscope, and high-resolution pictures of the fragments, so that a detailed comparison with complete coffins can be achieved. Access to physically complete coffins is necessary, since publications often only show the front of a coffin, seldom the decorated sides or inner surfaces, and hardly ever are the rear, or other undecorated surfaces depicted. Moreover, the resolution of the photographs in publication is often not high enough to distinguish small details which, when working with small fragments, is often decisive. The study of a comparative object exhibited in a well accessible museum usually leads to the best result. Yet, similar to the limitations observed in relevant publications, not

all the sides of the objects are always visible, and the reflection of the showcase's glass adds, at least in some cases, a further barrier.

3 Yellow Coffin Fragments from TT 95: Two Case Studies

In the following, two case studies will be looked at it in more detail. A short overview of the first case study, a coffin ensemble with an overall yellow decoration (CO7), will be given. The group consists of fragments from an anthropoid inner coffin (CO7.1,) and a two-piece open-work mummy-board (MASK2 and body-board CO7.2). Only a small number of fragments are preserved for both objects. First, the characteristics in manufacture, decoration, and inscription will be outlined. In a second step, the coffin type to which these fragments belong will be discussed. In a third step, individual aspects of the fragments will be highlighted with references to intact examples of the same coffin-types.

The second case study concerns a coffin ensemble with fragments of a rectangular outer coffin (CO2) and a mummy-mask MASK4. It will also be introduced briefly and compared to the first group of fragments (CO7) as well as to complete coffins. Observed similarities and differences will be defined and discussed.

3.1 CO7 and MASK2 from TT 95: Case Study 1

Thirteen fragments could be assigned to the CO7 group: LHTT2186, LHTT2185, LHTT3446, LHTT3435, LHTT3440, LHTT2120, LHTT2119, LHTT3354, LHTT3448, LHTT3436, LHTT3353, LHTT777, LHTT778, and LHTT4828. All these objects were recovered from the end of the sloping passage or Chamber 4 of substructure TT 95C (Fig. 1). Characteristic of this group is the polychrome decoration on a yellow ground and the varnish covering. On three fragments (LHTT2186, LHTT3435, and LHTT3436; for fragment LHTT2186 see Pl. 1) remains of a polychrome inscription are visible. The polychrome inscription, as well as the prominent yellow ground colour, suggests that the fragments belong to the yellow coffin type. The quite sparse application of the decoration and inscription are a common feature of a yellow coffin of the first phase,[11] the characteristic coffin type of the Ramesside Period.[12] Additionally, all fragments were cut from the same softwood, however, the precise species has not yet been identified. Samples have been taken and are being analysed in Cairo by the wood conservator, Nesrin el-Hadidi, and the archaeobotanist, Rim Hamdy. Apart from glue and paste, wooden (e.g., on LHTT2185) as well as bronze (e.g., on LHTT2120 and LHTT2119) nails were used for joining the wooden parts. The fragments further indicate that uneven elements of the surface were smoothed by a layer of brown paste[13] containing muna. Prior to the application of the decoration, the surface was additionally covered with two thin layers of a very fine and homogenous white paste. Some fragments preserve the complete wall thickness and their measurements vary between 1.5 and 3.0 cm. Although the wall thickness of a coffin usually varies to a certain extent, the observed measurement values can be understood as a first indication that the fragments possibly belonged to two different objects.

11 The distinction and terminology of the yellow coffins of the first and of the second phase follows that used by Taylor 2001: 169–171.

12 For an overview on the yellow coffins of the first phase and especially of the Ramesside Period see Cooney 2007.

13 The term 'paste' is used according to Strudwick/Dawson 2016: 247. No analyses of the exact components on the TT 95 material have so far been undertaken.

The rounded edges of some fragments (e.g., LHTT3448) as well as the open-work technique on two joining fragments (LHTT777, LHTT778 Pl. 2a) further confirm this assumption. Although smaller than generally seen on open-work objects, the holes were clearly intentional: they match the decoration well and were made before the decoration was applied. Open-work technique is also characteristic for the Ramesside Period and was applied on the body-boards of the two-piece mummy-boards.[14]

3.2 Coffins of the Yellow Coffins First Phase Style

The yellow coffin type emerged during the reign of Amenhotep III and was used contemporaneously with the black type until the reign of Ramesses II.[15] It became more predominant during the Ramesside Period and prevailed until the beginning of the 22nd Dynasty. As several changes took place at the transition from the New Kingdom to the Third Intermediate Period, the yellow coffins common during the New Kingdom are, in standard publications, distinguished as 'yellow coffins of the first phase'[16] whereas those of the early Third Intermediate Period are termed 'yellow coffins of the second phase'[17]. During both phases, yellow coffin sets usually consisted of three parts, a mummy-board, an inner, and an outer anthropoid coffin. A few sets found in TT 1 in Deir el-Medina even contained a mummy-mask and a rectangular outer coffin similar to the earlier black coffin ensembles.[18]

3.2.1 Anthropoid Coffins

While the style of the anthropoid black coffins' decoration continued to be used on the yellow ones, the colour of the background switched with the colour of inscription: on the early yellow coffins the central inscription, as well as the inscription on the three to four lateral bands, were executed in black.[19] Over time, the bands

14 For comparison see e.g., the mummy-boards of Henutmehyt (London, British Museum EA 48001, published in Taylor 1989: 36–37, fig. 26–27; Taylor 1999; Cooney 2007: 402–404; https://research.britishmuseum.org/research/collection_online/collection_object_details.aspx?objectId=158615&page=3&partId=1&searchText=henutmehyt), Takayat (Frankfurt, Liebighausmuseum 1651e–f, published in Polz 1993 and Cooney 2007: 410–412;), and Tamutnefret (Paris, Louvre N2620 and N2623, published in Cooney 2007: 416–418; https://www.louvre.fr/en/oeuvre-notices/tamutnefret-s-coffins).

15 See e.g., Ikram/Dodson 1998: 214–216. Niwiński's dating to the post-Amarna period as the starting point of the yellow coffins (Niwiński 1988: 12) can be opposed by the coffin of Teti (Brooklyn Museum 37.14Ea-b, published in Ikram/Dodson 1998, 216; Dodson 1998: 338; Bleiberg 2008: figs. 34 and 114; https://www.brooklynmuseum.org/opencollection/objects/3932). The use of the black coffin until the reign of Ramesses II is according to Dodson 1998: 336.

16 See Taylor 2001: 169. This corresponds with Niwiński's type YI. Coffins of this type are mainly from the Theban or assumed Theban area, suspected or proven Saqqara provenance (Cooney 2007: 183), or Sedment (Franzmeier 2017: 180–187).

17 See Taylor 2001: 170. The finds of the tomb of Iurudef contain coffins showing transitional elements from the 20th and 21st Dynasty coffins (Raven 1991 and Cooney 2017: 279).

18 For the Ramesside coffin ensembles see also Cooney 2017: 279.

19 See e.g., the coffin of Teti (Brooklyn Museum 37.14Ea-b) and the coffin of Tairesekheru (Edinburgh, Royal Museums of Scotland RMS 1887.597, published in Ikram/Dodson 1998: 225, fig. 285; Taylor 1989: 38, fig. 29; Manley/Dodson 2010: 30–31). In some instances, the monochrome inscriptions were executed in blue,

of inscription multiplied, and hieroglyphs were mainly applied in polychrome, but examples with monochrome writing continued throughout the Ramesside Period.[20] For polychrome inscriptions, individual signs were now generally sketched in red and painted in blue, green, and red. Whether a specific colour code evolved and was also used in a similar fashion for the yellow coffins of the second phase is still being researched.[21]

The characteristic yellow background could be achieved via two techniques:[22] the first and less expensive procedure was by simply painting the surface yellow. In this method, the cheaper and more easily available yellow ochre pigment, which because of its rounded structure absorbs light and therefore appears somewhat dull,[23] was normally used.[24] A more elaborate version was, however, to cover the white paste or yellow painted background with varnish.[25] If a yellow pigment was used, it mostly seems to be orpiment or a mixture of yellow ochre and orpiment.[26] The latter is an arsenic but precious pigment.[27] Because of the orpiment's structure, it reflects the light and thus appears shinier than its ochre counterpart.[28] However, exposed to light, the orpiment loses its yellow colour – unless it is covered with a resinous varnish. Additionally, experiments undertaken by Meghan Strong and the Fitzwilliam Museum in Cambridge showed that surfaces with an ochre-orpiment mixture and covered with a varnish are reminiscent of a golden surface[29] when lit

e.g., the coffin of Katabet (London, British Museum EA 6665; published in Ikram/Dodson 1998: 216 and Cooney 2007: 404–406; https://research.britishmuseum.org/research/collection_online/collection_object_details/collection_image_gallery.aspx?assetid=405958001&objectid=124664&partid=1).

20 The decision of decorating the coffin with polychrome hieroglyphs might have depended on the wealth of the coffin owner and his or her family. Pigments such as Egyptian blue were much more costly than the charcoal black pigment. See e.g. Cooney 2007: 80. Furthermore, polychrome decoration seems to have been restricted to the Theban area; coffins from northern necropoli continue to be decorated in the monochrome style (Cooney 2017: 280).

21 Alessia Amenta, comment on the polychrome hieroglyphs at the International Conference of Egyptologists in Cairo, November 2019. Differences in colour uses may also have depended on the availability of the pigments and the financial resources of the deceased and her/his family.

22 See Cooney 2007: 186.

23 Strong 2018: 176.

24 The yellow ochre consists of clays, iron oxides, goethite and limonite (Strong 2018: 176 and Lee/Quirke 2000: 115). The Valley of the Colours close to the Sheikh Abd el-Qurna necropolis provided local yellow and red ochre.

25 The original colour of the varnish is unclear. It may have been transparent and become darker through the heating process or through ageing (see e.g., Lucas 1962: 356–361 and Serpico/White 2001: 33).

26 Cooney observed in her studies that orpiment was usually covered with varnish (Cooney 2007: 186). Research by conservators has revealed that this might be due to the instability of this pigment (Green 2001: 46). Only resent research has shown the similarity of orpiment, and especially the mixture with ochre and a varnish cover, to a golden surface (Strong 2018).

27 Strong 2018: 175–176. Orpiment had to be traded from the Near East (modern Kurdistan, Iran, Syria and Anatolia). Exceptional and valuable materials, such as orpiment, were mentioned on texts from Deir el-Medina, while commonly used materials were not mentioned at all (see e.g., Cooney 2007: 80 and 117).

28 Strong 2018: 176.

29 It is widely accepted that the yellow pigments served as a cheaper substitute for gold (see e.g., Taylor 2001: 165 and 166).

in the dark with a torch.[30] Although the sheet-like structure of orpiment can generally be distinguished from the rounded one of yellow ochre by the naked eye, the determination of a mixture of both pigments needs more expertise. Only a few analyses of the yellow pigments have been undertaken and thus the amount of coffins with a mixture of both pigments is impossible to determine at the current stage of research.[31] Examples of the coffins with orpiment and varnish include the anthropoid coffins of Takayat[32], Ant[33], and Tamutnefret[34]. A good example of a coffin with a yellow background achieved through the application of yellow ochre is the coffin of Khnumsanapahsu.[35]

Exceptions to the rule are the anthropoid coffin of Katabet[36] and an anonymous lid in Atlanta;[37] both of which were painted with yellow ochre and varnished.[38]

Similar to the textual layout and content of the earlier black coffins, the vertical inscribed band usually bears an invocation of the goddess Nut. The goddess herself was depicted above the inscription and beneath the collar, with her wings open to protect the deceased. Two to seven horizontal text bands were applied on either side of the vertical inscription. They contained further spells for protecting the deceased, usually in the form of *ḏd mdw jn* (deity) or *ḏd mdw im3ḫy ḥr* (deity). The named deities included the four Sons of Horus, Nut, Geb, Re, Isis, Nephtys or Anubis, who were usually depicted in the compartment above or beneath the invocation.[39]

The compartments between the vertical and lateral inscribed bands on the black and early yellow coffins were left blank, but approximately from the post-Amarna or early Ramesside period onwards they were filled with figures of deities or the deceased.[40] The longitudinal inscriptions multi-

30 The attribution of the varnish to a gold-like appearance of the yellow ochre-orpiment surface and the stabilization of the orpiment pigment seem not to be the only reasons for choosing a varnish finishing of the coffin. The varnish also carried a symbolic significance to the transformation of the deceased into a divine one (see e.g., Lucas 1962: 324; Taylor 2001: 165 and 166; Serpico/White 2001: 36).

31 Analyses have been carried out on the mummy-mask and body-board of Weretwaset (Brooklyn, Brooklyn Museum 37.47E) and published in Kariya/Bruno/Godfrey/March 2010: especially 101, table 1.

32 Inner coffin of Takayat (Frankfurt, Liebighaus Museum 1651c–d) and outer coffin (Frankfurt, Liebighaus Museum 1651a–b, published in Polz 1993 and Cooney 2007: 407–410). The pigments have not been analysed and the identification of it has been done by observation (Cooney 2007: 186 and 214).

33 Ant (Vatican City Rome, Vatican Monumenti Musei, published in Cooney 2007: 472–475). The pigments have been analysed chemically (Cooney 2007: 214).

34 Inner coffin of Tamutnefret (Paris, Louvre N2571) and outer coffin (Paris, Louvre N2631). Both published in Niwiński 1988: 166; Cooney 2007: 413–416.

35 Berlin, Ägyptisches Museum und Papyrussammlung, Staatliche Museen zu Berlin 8505 and 8506. Published in Niwiński 1988: 109 and Cooney 2007: 462–464.

36 The coffin of Katabet (London, British Museum EA 6665). Analyses performed and published by Serpico/White 2001: 34.

37 Anonymous coffin lid (Atlanta, Michael C. Carlos Museum L2003.14.38, published in Cooney 2007: 480–482. Observation noted by the conservator Renee Stein and communicated with Cooney in 2006 (Cooney 2007: 186, Stein/Lacovara 2010: 5–6).

38 Cooney 2007: 214.

39 See also Cooney 2007: 189–190; Assmann 2005: 278–279; Elias 1993: 325, n. 6; Niwiński 1988: 12.

40 Cooney 2007: 187 –189. Exceptions are the coffins of Henutmehyt (London, British Museum EA 48001, published in Taylor 1989: 36–37, fig. 26–27; Taylor 1999; Cooney 2007: 398–402 and well visible on the mu-

plied and the vignettes of the gods and the deceased increased in numbers. Empty spaces beside the main compositional elements started to be filled with small symbols, but contrary to the early Third Intermediate Period coffins, the overall decoration retained its aspect of spaciousness.[41] In Niwiński's typology of the yellow coffins, this type of coffin is labelled YIb.[42] In contrast to the bright surface of the outside of these coffins, their interiors appear to follow earlier decorative traditions[43] and most of them were either painted black[44] or covered with a black varnish.[45]

Niwiński's Type YIa represents a very unique decoration scheme of the coffin lid that seems to have been restricted to the 19th Dynasty.[46] The deceased was depicted in a life-like appearance, wearing a white garment.[47] Both the kilts of the men, and the dresses of the women, were usually pleated, either modelled in the paste layer below the painting or applied in colour. Between the bare feet, a short vertical text-band is visible containing the titles and name of the deceased.[48] While both hands of the male coffins are shown flat on their thighs, on the female version, one hand is placed on the chest and in some instances, the deceased is holding flowers in her hand. The imagery of this lid decoration shows the deceased after having successfully entered the afterlife.[49]

For both lid types YIa and b, the skin colour of the anthropoid coffins could either be yellow or red and no distinction was made between men and women. Generally, the painted faces were covered with a layer of varnish. In some instances, the faces and hands were covered with gold leaf in-

seum homepage https://research.britishmuseum.org/research/collection_online/collection_object_details.aspx?objectId=158614&page=1&partId=1&searchText=henutmehyt) and Tamutnefret (Paris, Louvre N2571 and N2631), where the focus was laid on the inscriptions and no space was left for figural depictions.

41 For an overview of the yellow coffins dating to the Third Intermediate Period and with an introduction on the yellow coffins in general, see Niwiński 1988.

42 Niwinski 1988: 13 (Fig. 10) and 68.

43 See Dodson 1998; Taylor 2001: 168. The white and black coffins of the earlier part of the New Kingdom were already painted black or covered with a black substance on the inside. For white coffins see e.g., the coffin of Amenhotep I, Cairo, Egyptian Museum CG 61005 and the coffin of Thutmose II, Cairo, Egyptian Museum CG 61013 (published in Daressey 1909, 7–8, 18, pl. VI, VII, XIII) and for the black coffins see e.g., coffin of Yuya, Cairo, Egyptian Museum CG 51003, rectangular coffin of Thuya, Cairo, Egyptian Museum CG 51005, the outer coffin of Thuya, Cairo, Egyptian Museum CG 51006 (published in Quibell 1908: 9, 20, 23). While black varnish was rare on the white coffins and might have been applied as part of an upgrade for their reuse at the end of the New Kingdom, there are more examples for the black coffin type (see Taylor 2001: 167 and 168).

44 Taylor 2001: 166.

45 Taylor 2001: 166 and Cooney 2007: 190. An exception is the coffin lid of Iyneferty with text on the interior. The coffin of Iyneferty, New York, Metropolitan Museum of Art 86.1.5b–c, published in Cooney 2007: 450–452.

46 Niwiński 1988: 13 (Fig. 11) and 68. Examples of this type are the coffin lid of Isis (Cairo, Egyptian Museum 27309a, published in Cooney 2007: 435–437 and Niwiński 1988: 118, no. 78), the coffin lid of Tairesekheru (Edinburgh, Royal Museums of Scotland RMS 1887.597).

47 See e.g., Niwiński 1988: 68; Cooney 2007: 195; Bettum 2012: 117 and 126.

48 Cooney 2007: 196.

49 E.g., the female coffin lid of Weretwaset (Brooklyn, Brooklyn Museum of Art 37.47E b, published in Cooney 2007: 422–423; Bleiberg 2008: 124–126, and well visible on the museum's homepage https://www.brooklynmuseum.org/opencollection/objects/116784).

stead of being painted.[50] Both, on the men and women's wigs, the strands were carved into the paste layer and painted black.[51] The top of the head was decorated with a floral and geometric patterned garland, often with a lotus or small flower bouquet placed above the forehead. The shapes of the wigs were manufactured differently depending on gender. The male duplex wig was worked in two layers and the parts falling down onto the shoulders each end in a curved lappet. The female tripartite wig was composed of a single layer only and the lappets end in a straight line. In their lower part, the lappets were sometimes adorned with a decorative band. Beneath the lappet, the breasts were generally painted or modelled in paste. On the type Y1b coffin lids a further distinction between both sexes was the position of the hands: while the men's hands were clenched and held amulets, the women's hands were open, thus not holding any objects, but their fingers and wrists were often adorned with jewellery.[52]

The anthropoid coffins of the yellow type were manufactured out of wooden planks and joined together with wooden nails. According to Cooney, mortises and tenons were only used to fix the lid to the coffin case.[53] Poorly constructed coffins needed a large amount of paste[54] or linen to fill gaps, while carefully worked coffins were only covered with a very thin layer of fine white paste that served as decorative ground. The face and front part of the wig was generally made separately and then attached to the lid. The female wig lappets and the crossed arms over the chests of both genders were sometimes directly carved into the wood of the coffin lid or prepared on a separate piece of wood, which was then attached to the lid with wooden nails.[55] The hands were also usually worked separately and attached before the coffin was covered with a layer of paste. The decorative scheme was roughly outlined and the figures generally sketched in red. Then the coffin was polychrome painted and, in some instances, varnished. If gilding and inlays were used, they were probably attached before the decoration was applied, but surely before the coffin was varnished.[56]

50 Examples for yellow faces on a woman's coffin include Takayat (outer coffin, Frankfurt, Liebighausmuseum 1651a–b) and a man's coffin Padjamun (Cairo, Egyptian Museum JE 26220 / CG 61011, published in Daressy 1909: 12–17, pl. XII and Cooney 2007: 466–468). Examples for red faces on a woman's coffin include Isis (Cairo, Egyptian Museum JE 27309a) and the inner coffin of Sennedjem (Cairo, Egyptian Museum 27308, published in Cooney 2007: 430–432). And faces with gilding: the inner coffin of Takayat (Frankfurt, Liebighaus Museum 31035), both coffins of Tamutnefret (Paris, Louvre N 2620 and N 2623), and both coffins of Henutmehyt (London, British Museum EA 48001). The golden skin colour was a reference to the divine status the deceased hoped for in the hereafter; the flesh of the gods was often described as being of gold. For the symbolic meaning of gilded faces see Taylor 2001: 165. Even more than the orpiment, only people of high rank could afford to adorn their coffin with this valuable material (Taylor 2001: 166).

51 See e.g., Kariya/Bruno/Godfrey/March 2010: 97.

52 Cooney 2007: 187.

53 Cooney 2007: 190–191.

54 Cooney 2007: 190–191.

55 Cooney 2007: 193. A similar feature can be observed in the manufacture of the arms and hand of the previous black coffin type (Taylor 2001: 168).

56 This can be clearly observed on the mummy-mask of an anonymous man (Basel, Antikenmuseum Basel und Sammlung Ludwig, no inv. no., item on loan. Although it is a different object category, the general *chaîne operatoire* was the same.

3.2.2 Mummy-Masks

Mummy-masks already formed part of the funerary ensemble from the Old Kingdom onwards.[57] From the beginning, they were generally made of cartonnage[58], and covered the face, parts of the chest and sometimes the rear of the head.[59] They were apparently modelled over an endurable or temporary core, using several layers of linen soaked in glue. Their in- and outside were covered with several thin layers of a fine white paste, which gave additional stability to the mask and provided a smooth surface ideal for decorating. The insides of the masks were either left blank,[60] or were covered with a black substance, most likely strongly heated pistacia resin or a mixture of pistacia resin and bitumen.[61] The outside was usually polychrome painted. In some instances, the face was covered with gold leaf,[62] and glass or stone inlays were used for eyes, eyebrows, and sometimes the collar.[63] During the 18th Dynasty the mummy-mask was restricted to the higher elite, although not every rich burial ensemble contained this element.[64] Why some burials were provided with mummy-masks and others not is an, as yet, unanswered question. Similar mummy-masks continued to be used during the first part of the Ramesside Period; well-known examples being found in TT 1, belonging to Sennedjem[65], Isis[66], Khonsu[67], and Iyneferty[68].

Contemporary with these masks, a new type evolved: its elongated front part was meant to cover the complete breast down to the abdomen. Besides the head, wig and collar, crossed arms were included beneath the collar. Contrary to the earlier type, the rear of the head was only covered to the neck[69] or not at all[70]. This more common latter version was generally made of wood.[71] Two of the few preserved cartonnage examples are the mask of the lady Weretwaset[72] and the mask of an anonymous man[73]. The latter shows well

57 Seeber 1980; Tacke 1996; Ikram/Dodson 1998: 167; Grajetzki 2003: 29; Casini 2017: 58.

58 There are some masks made of paste only (Sweeney 1993) or manufactured in wood (e.g., the anonymous mask in London, British Museum EA 22912, Taylor 1994: 169, fig. 117).

59 These masks are sometimes referred to as helmet-masks (Assmann 2002: 153; Casini 2017: 58).

60 E.g., the mask of Satdjehuty (London, British Museum EA 27790, published in Taylor 1996: 36).

61 E.g., New York 30.8.69, Reeves 2013: 17. For the black substance see Serpico/White 2001: 35.

62 The mask of Maihirpri (Cairo, Egyptian Museum CG 24096, published in Ikram/Dodson 1998: 170, fig. 198; Lakomy 2016: 142–146).

63 E.g., the mask of Thuya (Cairo, Egyptian Museum CG 51009, published in Vassilika 2010: 40–41).

64 Casini 2017: 67; Smith 1992: 199.

65 Cairo, Egyptian Museum JE 27308, published in Cooney 2007: 434–435.

66 Cairo, Egyptian Museum JE 27309a, published in Cooney 2007: 437–438.

67 New York, Metropolitan Museum of Art 86.1.4, published in Cooney 2007: 449–450; https://www.metmuseum.org/art/collection/search/544709.

68 New York, Metropolitan Museum of Art 86.1.6a, published in Cooney 2007: 454–455.

69 See e.g., Katabet (London, British Museum EA 6665).

70 See e.g., Takayat (Frankfurt, Liebighaus Museum 1651e, published in Polz 1993 and Cooney 2007: 410–411).

71 Cooney 2007: 23. See e.g., the mummy-masks of Henutmehyt (London, British Museum EA 48001, published in Taylor 1999), Takayat (Frankfurt, Liebighaus Museum 1651e) and Tamutnefret (Paris, Louvre N2623, published in Cooney 2007: 416–417).

72 Mummy-mask of Weretwaset (Brooklyn, Brooklyn Museum 37.47E a–b, published in Cooney 2007: 29, 475–476 and Kariya/Bruno/Godfrey/March 2010).

73 In private possession. Until June 2019 exhibited in the Antikenmuseum Basel und Sammlung Ludwig, no inventory number.

that the construct was built of three to five layers of tightly glued linen. The inside was covered with a black substance.[74] On the outside, three layers of white paste were applied and reached a thickness of 2.5 cm. This thickness was necessary for the eye-inlays, which were made of frit. Although this mask was painted yellow and was varnished, the application of gold leaf was more common for this type of mask.[75] Unfortunately, no other part of the anonymous man's burial ensemble is extant. It is known from the majority of other elongated masks that they were almost always combined with an open-work body-board, suggesting that the masks formed the upper part of the two-piece mummy-boards.

3.2.3 Mummy-Boards

The origin of the lower part of the two-piece mummy-board, the open-work body-board, seems to lie within the mummy-bindings of the 18th Dynasty. Contemporary with the black coffins of the 18th Dynasty, bands that were formerly applied to keep the mummy-shroud together, developed into independent inscribed mummy-bands.[76] They could either consist of simple bands of textile[77] whereon the paint was directly applied,[78] or, similarly to the mummy-masks, multiple layers of textile, glued together and covered with a thin layer of fine white paste, serving as the ground for additional decoration.[79] Because of the multiple layers of textile and the paste, the bands could be formed over the mummy, and, once dry, keep their shape. Over time, figures of deities were commonly placed in the compartments between the bands.[80] In contrast to the coffins, however, these were manufactured in open-work technique and the mummy-shroud beneath was thus visible. Body-boards could be made out of cartonnage or wood.[81] For the cartonnage

74 Not enough analyses have so far been conducted to have general idea on the contents of the black substance. Kariya/Bruno/Godfrey/March describe it as "resinous material" (Kariya/Bruno/Godfrey/March 2010: 99) and Serpico/White's analyses on some New Kingdom materials have shown that the origin of the black substance might be a strong heated pistacia resin or a mixture of the pistacia resin with bitumen (Serpico/White 2001: 35). Further research on black substances used on coffins have been undertaken by McCreesh/Gize/David 2015 and Harrell/Lewan 2002.

75 See e.g., the masks of anonymous woman, the so called Kanefernefer (St. Louis, St. Louis Art Museum 19:1998, published in Goneim 1957: 23–27, pl. LXVII–LXVIII; Cooney 2007: 482–483; Cooney 2017: 287), Katabet (Louvre, British Museum EA 6665); Henutmehyt (London, British Museum EA 48001), Takayat (Frankfurt, Liebighaus Museum 1651e) and Tamutnefret (Paris, Louvre N2623). Besides the mask of the anonymous man at the Antikenmuseum Basel und Sammlung Ludwig, there is a further mask without gilding, the one of Ram (St. Petersburgh, Heremitage 787, published in Cooney 2007: 440–442).

76 See e.g., Ikram/Dodson 1998: 170.

77 It is generally assumed that the textile used was linen. However, no analyses have been undertaken so far and thus the more general term 'textile' will be used throughout the text.

78 Decorated mummy-bands of Isis, Chantress of Amun, found in TT 95C (Loprieno-Gnirs 2009: 165, Abb. 18) and Haslauer 2016: footnote 33. The mummy-bands will be published in more detail by Nadine Schönhütte and Noémi Villars.

79 Yuya (Cairo, Egyptian Museum CG 51010, published in Quibell 1908: 28–29).

80 Thuya (Cairo, Egyptian Museum CG 51011, published in Quibell 1908: 29–30 and Ikram/Dodson 1998: 171, fig. 199) was the earliest of this kind.

81 Because of the different material and craftsmanship, Cooney divides them into two separate types: The wooden body-boards are type 2 while the cartonnage

examples it seems as if the complete body-board was first made in one piece, then the open areas were cut out and the frame was decorated.[82] For the wooden examples, a different method was used: the strips meant to contain the text-bands were attached first. Several horizontal strips of a thin wood were joined to the left and right side of the three vertical wooden strips. Then Nut was put on the top of the construct with her wings outspread in an attitude of protection. Finally, carved figures were set within the compartments and attached to the construct with glue or resin. In a few instances wooden nails can be observed. Another technique to strengthen the structure of the boards was to cover them with one or two layers of linen.[83] Once the timbering of the body-board was finished, the surface was covered with a layer of white paste and painted.

The mummy-mask and the body-board evolved into a two-piece mummy-board, which then became an integral part of a yellow coffin set. It is worth noting that these two-piece mummy-boards never seemed to be part of a set with regular mummy-masks. However, contemporary to the two-piece mummy-boards, a single mummy-board evolved as well. These mummy-boards could also be manufactured and decorated showing the deceased as an Akh, wearing a white kilt or dress, similar to Niwiński's anthropoid inner coffin lid type YIa. Contrary to the two-piece mummy-boards, these one-piece examples were sometimes combined with short mummy-masks.[84]

3.2.4 Rectangular Outer Coffins

Besides mummy-masks, mummy-boards, and inner anthropoid coffins, sets could also include an outer anthropoid or rectangular coffin. Of the latter, only two examples are preserved: the ones of Sennedjem and Khonsu found in TT 1.[85] They are similar to the rectangular coffins of the

examples are type 3 (Cooney 2007: 18). Cooney's type 4 will not be discussed here since it dates to the end of the New Kingdom. It is a one-piece mummy-board completely manufactured in cartonnage and the decoration is reminiscent of the mummy-boards dating to the 21st Dynasty (Cooney 2007: 18 and Cooney 2017). For a more detailed reading, see Schreiber 2006, Schreiber 2015 and Schreiber 2018.

82 Examples for the cartonnage body-boards are Weretwaset (Brooklyn, Brooklyn Museum 37.47E d, published in Cooney 2007: 475–476 and Kariya/Bruno/Godfrey/March 2010) and Meritre (fragmented, found in TT 295, published in Hegazy/Tosi 1983: 29–30, Pl. 12). Apart from the two-piece mummy-boards of Weretwaset and Meritre, further three body-boards from Deir el-Medina were found without masks. Cooney argues, therefore, that it is not clear whether these were always combined with a mask (Cooney 2007: 23). Additionally, Weretwaset's mummy-mask and body-board were manufactured with different quality of linen, and contrary to the mask, the board was not varnished. These observation together with the reuse of the coffin, most likely during the 20th Dynasty, lets Cooney suggest that also the board might be of a later date (Cooney 2007: 475; Kariya/Bruno/Godfrey/March 2010: 99). According to Schreiber, however, the open-work technique was abandoned in the beginning of the 20th Dynasty, at least for the wooden examples (Schreiber 2018: 192). A similar dating of the mask and board seems thus more likely.

83 This technique can be observed on the fragment exhibited in the Antikenmuseum Basel und Sammlung Ludwig, Switzerland (Inv. No. BSAe1233), as well as on the body boards of Henutmehyt (London, British Museum EA 48001) and Tamutnefret (Paris, Louvre N2620). For the last two see Cooney 2007: 199.

84 Cooney 2007: 195. Examples for a combination are the burial assemblage of Iyneferty and Sennedjem.

85 Cooney 2007: 199–200.

black type,[86] but with an extensive polychrome decoration. The long sides include vignettes and text excerpts from the book of the Dead. On the short sides, the four protective deities, Nephtys, Isis, Selket, and Neith, are depicted. On the lid various demons with knives can be seen. The top of the box is adorned by a cavetto cornice and an inscription band that continues down the corner pillars. As is the case for the black coffins, the rectangular coffins of the yellow type were also placed on a sledge.

3.3 CO7 and MASK2 from TT 95: In More Detail

3.3.1 Fragments of an anthropoid coffin (CO7.1)

Returning to the fragments from TT 95 we can see that several characteristic elements of the inner anthropoid coffin can be observed on the fragments: polychrome decoration and inscription on a yellow ground, varnish covering the complete surface, protection spells on the horizontal inscription bands, a depiction of Nut, Khebesenuef, and the deceased.

Fragment LHTT2186 clearly exhibits the anthropoid shape of the coffin (Fig. 2 and Pl. 1). It derives from the lower leg area of the proper left side and contains parts of two lateral bands with polychrome inscription: the upper naming Hapy, and the lower one Khebesenuef. The inscription within the lateral bands was sketched in red and filled with blue, red, and green. A figurative representation of Hapy is partially preserved between the two bands and shows him standing in front of a richly equipped offering table. His name is mentioned a second time in plain black hieroglyphs, just above his baboon-head. Beneath the band mentioning Khebesenuef, a woman is depicted in a pleated dress, wearing a wesekh-collar around her neck. She is adorned with looped earrings and an unguent cone with a closed lotus-flower on top of her head. Her hands are raised in adoration towards a figure sitting on a throne, most likely a deity. The black inscription above her mentions a name […] *rwrw*, followed by *m³ᶜ-ḫrw*. It thus seems likely that the depicted woman is actually the deceased,[87] and that *rwrw* is, or forms part of, her name.[88] A similar iconography is found on a second fragment LHTT3440. In this instance, however, only the left arm and sleeves of the pleated dress, as well as parts of the wesekh-collar, are visible. Due to the orientation, fragment LHTT3440 is also most likely from the left side of the coffin. Apart from these two fragments with figurative depictions, and two additional pieces with inscriptions (LHTT3435 and LHTT3436), no further

86 E.g., the rectangular coffin of Maihirpri (Cairo, Egyptian Museum CG 24001, published in Lakomy 2016: 101–117, pl. 23–25, fig. 58–90), Yuya (Cairo, Egytian Museum CG 51001, published in Quibell 1909: 1–3, pl. 1) and Thuya (Cairo, Egyptian Museum CG 51005, published in Quibell 1909: 17–20, pl. 7–8.

87 Besides the deceased, also members of his or her family are sometimes depicted on the mummy-boards or anthropoid coffins. See e.g. the inner coffin of Khonsu (New York, Metropolitan Museum of Art 86.1.2a–b, published in Cooney 2007: 447–449; https://www.metmuseum.org/art/collection/search/544705).

88 A reconstruction of the complete name for a female deceased has so far not been possible. There is no name written with Gardiner sign E23 twice at the end in Ranke. E23 as part of the name, however, seems quite common during the New Kingdom and could be used for men and women (Ranke 1935: 220–221). In Schneider the name, solely written with the two E23 signs, is mentioned three times, dating to the early 18th Dynasty, the reign of Ramesses I, and the reign of Sety I. The origin of this name seems not to be clear and does not have to be of foreign origin (Schneider 1992: 154–155, no. N326–N328).

fragments can be securely related to the anthropoid coffin. Fragments showing only wings and feather ornaments presumably come from either the inner coffin or the mummy board.

The fragments allocated to the anthropoid coffin CO7.1 demonstrate that the coffin was, at least partly, manufactured out of an imported softwood.[89] It is unclear if in some instances, muna (e.g., LHTT2242) or textile (e.g., LHTT4828) was used as filling material, or whether these fragments stem from the mummyboard of the same ensemble. The surface on the outside was covered with two layers of a fine white paste, before the polychrome decoration was applied: yellow ochre served as the ground and then the decoration was sketched with a reed-pen in red. Red, green, blue and white were used to fill in the areas of the depictions and were applied with a brush. Then the outlines of the depictions were added in black. While the polychrome hieroglyphs of the lateral bands seem to have been executed at the same time as the figurative depictions, the black inscriptions within the compartments were done in the same working process as the outlines. The last step was the covering of the complete surface with varnish. The yellow ochre background has, however, only been inspected by the naked eye; if, indeed, no orpiment was mixed with it, this coffin belongs to the exceptions of yellow coffins using varnish on ochre. Whether the inside was painted black or covered with a black substance cannot be reconstructed since the inner surface is not preserved on any of the fragments securely assigned to the coffin.

The coffin was manufactured using valuable materials such as imported wood, Egyptian blue pigments, and varnish. Beside wooden nails, bronze nails were used too. As far as the author is

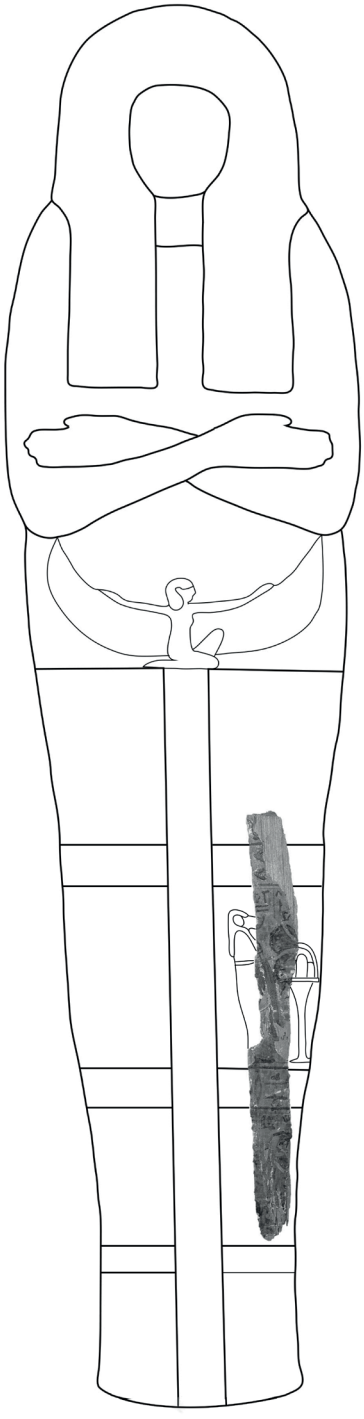

Fig. 2: Reconstruction with LHTT2186 placed on the outline of an inner anthropoid coffin (© University of Basel, LHTT-Project, photo of LHTT2186: M. Kačičnik, 2019. Drawing: Ch. Hunkeler, taking the inner coffin of Henutmehyt (BM EA 48001) as a model).

89 Wood analyses are still being processed by N. El-Hadidi and R. Hamdy.

aware, the use of bronze nails has so far not been observed on any other coffin and would be an interesting topic for further research. The four preserved fragments suggest that the timbering of the coffin was carefully performed and that the decoration was applied with great care. However, the two fragments represent only a very small percentage of the original coffin. As mentioned before, further fragments (LHTT2242 and LHTT4828) contain filling material that would indicate a less well crafted coffin. The width of the two lateral bands as well as the height of the compartment show striking similarities with the inner coffins of Takayat and Tamutnefret, and thus suggest a decoration scheme popular during the early Ramesside Period. The iconography of the deceased supports this assumption.

3.3.2 Fragments of the Mummy-Mask (MASK2)
Only seven fragments (LHTT204, LHTT233, LHTT235, LHTT311, LHTT555, LHTT 556, and LHTT6784) of the mummy-mask MASK2 were preserved (Fig. 3). Fragment LHTT204 was found in Chamber 2 of substructure TT 95B, while all the other fragments were recovered from the fill of the Second Pillared Hall of tomb chapel TT 95A (Fig. 1). Three fragments (LHTT204, LHTT235, and LHTT311) completely manufactured in paste stem from the lower part of the front lappet. On the rear, at least three layers of textile are visible. The original interior surface, however, is missing. The strains of the lappets were modelled into the paste. The straight ends of the lappets indicate that they formed part of a female wig. Furthermore, remains of gilding can be seen at the very end of the lappets, showing that the mummy-mask was partially covered with gold leaf. This is confirmed by three further fragments of the mask's face: an inlayed eye, eyebrow, and the paste layer with gilding (LHTT233, LHTT555, and LHTT556). The paste layer is approximately 1.1 cm thick and consists of at least two layers. This observation agrees well with those obtained during the study of the mummy-mask in Basel. The last fragment (LHTT6784) shows the same material as the inlaid eye and also contains remains of gold. This fragment was part of the chemisette. The inlays of the eye and chemisette, the gold foil, and the shape of the wig lappets are very similar to the mummy-mask of Takayat; therefore a dating of MASK2 into the reign of Ramesses II is likely.[90] Furthermore, the manufacture and use of paste documented in the fragments of MASK2 are similar to the CO7 fragments. This observation was confirmed by the project's conservator Erico Peintner. More wooden fragments, LHTT3352, LHTT3353, LHTT3354 and LHTT3446, which were retrieved from the end of the Sloping Passage in TT 95C, might also belong to the mask. They are all joining and show a rounded lower edge. Because of their shape and floral decoration, they might be from the lower part of the mummy-mask's collar. If this assumption is correct, the mask was partially worked in cartonnage, and partially in wood.[91]

3.3.3 Fragments of an Open-Work Body-Board (CO7.2)
Only a few fragments can be allocated to the body-board with any degree of certainty. All of them were found at the end of substructure TT 95C (Fig. 1). Besides fragments with floral patterns (LHTT2184 and LHTT3360), rounded edges (LHTT3448) and wings (LHTT2185), they also include two joining fragments in open-

90 Takayat (Frankfurt, Liebighaus Museum 1651e).

91 Attributional wooden elements on cartonnage masks have been observed on other examples: on the cartonnage masks of Katabet (London, British Museum EA 6665) and Weretwaset (Brooklyn, Brooklyn Museum 37.47E c), where the arms and hands were manufactured in wood.

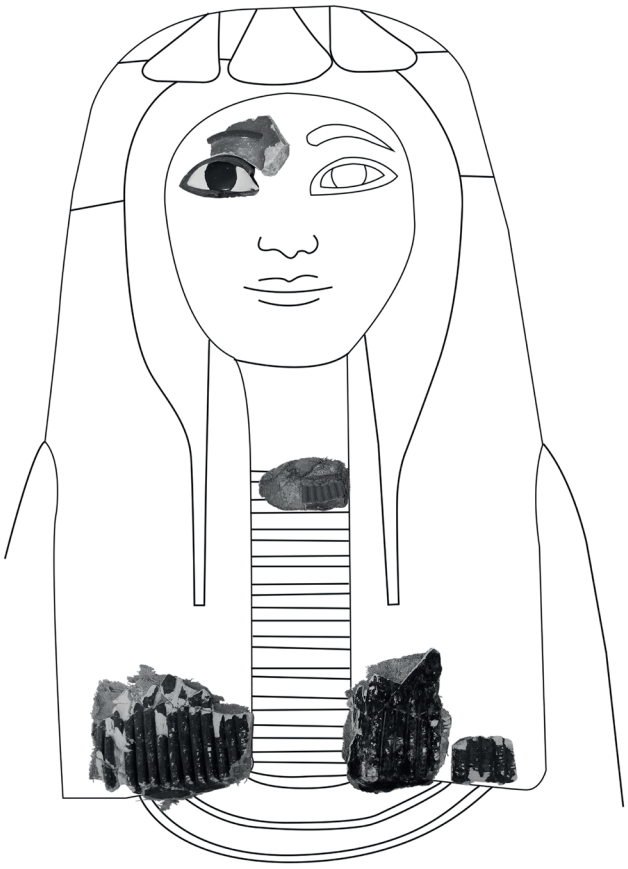

Fig. 3: Reconstruction of MASK2 (© University of Basel, LHTT-Project, photos and drawing: Ch. Hunkeler, 2018. Drawing done taking Takayat's mask (Frankfurt, Liebighaus Museum 1651e) as a model).

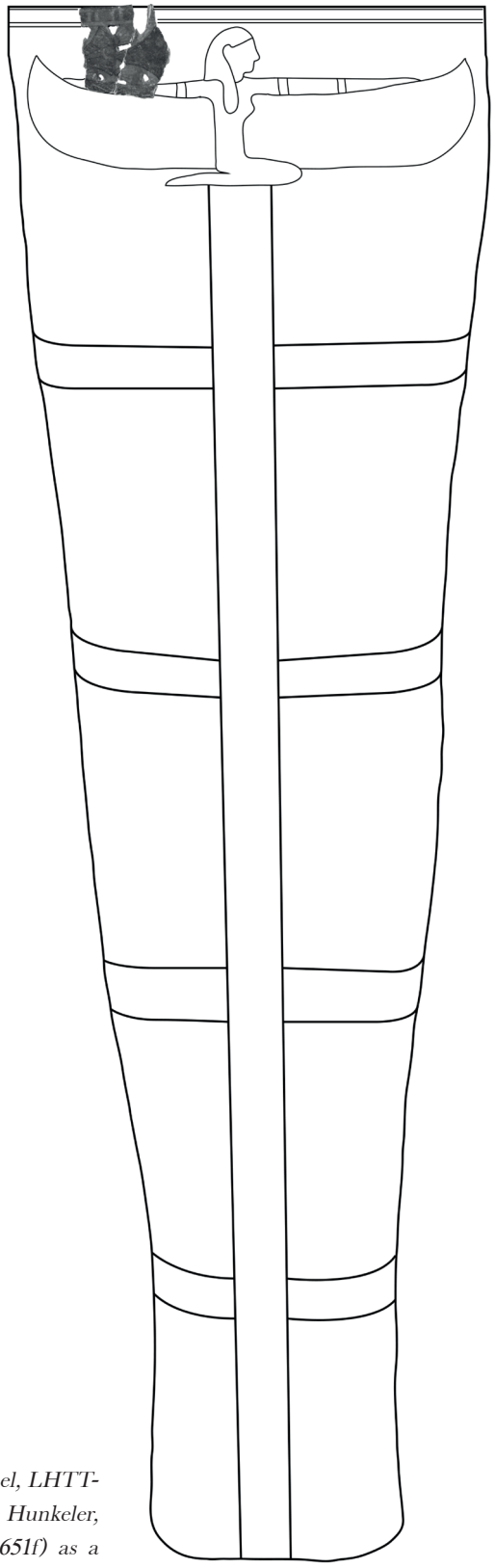

Fig. 4: Reconstruction of body-board CO7.2 (© University of Basel, LHTT-Project, photo of LHTT3744: M. Kačičnik, 2018, drawing: Ch. Hunkeler, taking Takayat's body-board (Frankfurt, Liebighaus Museum 1651f) as a model).

work technique (LHTT777 and LHTT778, Pl. 2a). On these two fragments, open lotus blossoms are visible; their similarity to the flowers on the offering table in front of Hapy on fragment LHTT2186 (Pl. 1) suggests that both coffin and body-board, were decorated in the same workshop. The green arm on the joining fragments LHTT777 and LHTT778 can be attributed to the goddess Nut, who is depicted at the upper edge of two-piece mummy-boards (Fig. 4). The *chaîne operatoire* for the decoration was the same as that observed on coffin CO7.1, with the exception that a first outline of the decoration must have taken place before the open-work was performed. Paste, pigments, and varnish that dripped inside the holes imply that they were applied only after a rough pattern was cut into the board. A similar outline of the decoration can also be observed on other open-work body-boards.[92] The rear of the board was covered with a thin layer of white paste and then painted black. This custom, on the other hand, seems to be more typical for coffins and one-piece mummy-boards.

Contrary to the above mentioned observations on the inner coffin and the mummy-mask, the few fragments securely assigned to the open-work body-board do not only match the results obtained during the study of the complete examples, but also demonstrate the limits of trying to fit objects into an existing typology. The thinness of some of the fragments and the rounded edges were a first indication that some of the fragments stem from a mummy-board rather than from a coffin. The open-work on two fragments further indicated that the mummy-board was of the open-work type. The depiction of an arm of Nut, who is usually depicted on the top of this type of mummy-board further supports this idea. However, comparing the fragments to complete ones and to other fragments, it became evident that the open-work was not achieved in the same way as observed in other wooden examples. The technique of having a board first and then to cut out the areas between the figures is a procedure that until now, was observed only in the production of the few known cartonnage examples.[93] It seems as if a technique originally reserved for one material category was eventually tested on another one. It must have been very difficult to achieve the open-work as the areas cut out from the wood are rather small. The result may not have been satisfactory and thus comparative material is lacking.

As mentioned above, the prototypes of open-work body-boards first appeared during the later years of Amenhotep III. The typical examples that form part of the yellow coffin sets are most common during the reign of Ramesses II. However, most of them are without find context, and this dating is only based on stylistic criteria.[94] Unfortunately, the rather peculiar manufacture of the open-work technique does not provide any more precise dating clues. It can be argued that the CO7.2 body-board was manufactured during the early stages of the open-work production, when experimenting with the technique was still in progress. But it might just as well be a coincidence: the right type of wood was not available, or the workshop involved was accustomed to manufacturing body-boards out of cartonnage and thus used the same technique. On some of these body-board fragments, the depiction of flowers is executed in a style similar to those on the coffin fragments. This similar-

92 Takayat (Frankfurt, Liebighaus Museum 1651f) and Tamutnefret (Paris, Louvre N2620).

93 Weretwaset (Brooklyn, Brooklyn Museum 37.47E a–b) and Meritre (fragmented, found in TT 295).

94 See e.g., Cooney 2007 and Bettum 2012.

ity, which means that in some instances it is not possible to differentiate them, suggests that both objects were manufactured in the same workshop, by the same hands, at roughly the same time. Whereas the fragments securely assigned to the coffin demonstrate a fine craftsmanship, the timbering of the body-board seems to have been executed in a less experienced manner. Together with the mummy-mask, the complete mummy-board seems to have been manufactured in an experimental way, using a wide range of material of which a high percentage was quite valuable and not easy to obtain. Since two-piece open-work mummy-boards are only well attested during the reign of Ramesses II, it might well be that this ensemble also dates to this period. The quite exceptional manufacture of the mummy-board and the spacious decorative style of the anthropoid coffin suggest that it might even be amongst the earliest of its kind.

3.4 Fragments of a Rectangular Coffin (CO2): Case Study 2

A further group shows similar characteristics and may also belong to the yellow coffins of the first phase. Only five fragments could be attributed to group CO2: LHTT2257, LHTT2260, LHTT2261, LHTT2262, and LHTT2295. Like most of the CO7 fragments, all CO2 fragments were found at the very end of the substructure TT 95C (Fig. 1). They were, however, not assigned to the CO7 group since they differ in various aspects: the wood used was sycomore (*Ficus sycomorus*) [95] and not the softwood characteristic for the CO7 fragments. The carving has been executed very precisely and directly into the wood. No additional brown paste was used; the white paste used as decorative ground was applied directly onto the wooden surface. The yellow background shows more reflecting elements; thus, a greater amount of orpiment seems to have been applied. The outline of all the hieroglyphs has been done in black, filled with red, green, and blue, and lastly, the varnish seems to be of a glue origin rather than a resin (Pl. 2b). Thus, this object was most likely manufactured in a different workshop and even, perhaps, at a different time. The black outline of the polychrome hieroglyphs might be an indication of a very early yellow coffin of the late 18th or very early 19th Dynasty.

Of the decorative scheme only very little is preserved. Fragment LHTT2257 shows a polychrome pattern outlined in black and filled with yellow, red and blue. The complete surface is varnished. The extant decoration is, by itself, too small to reveal any clues about the original image. On three additional fragments, only monochrome areas in either red or yellow are preserved (LHTT2258, LHTT2261, LHTT2262). The two most revealing fragments are LHTT2295 and LHTT2260 (Pl. 2b). On LHTT2295, two sides are preserved, each showing decoration. While one side is too fragmentary to provide a clear image, the other side displays part of an inscription. The vertical inscription column is framed by two thin green and a wider red band on both sides. Two names, Amun and Isis, are easily readable, but no determinatives or additional texts are preserved. A clue about the context of the names may be retrieved from mummy-bindings, which were found in the same location as the wooden fragments. According to their inscriptions, they belonged to a Chantress of Amun,[96] named

95 For more information on sycomore (Ficus sycomorus) see Cartwright 2019.

96 See Loprieno-Gnirs 2009: 165, Abb. 18 and Haslauer 2016: footnote 33. N. Schönhütte and N. Villars are planning a more detailed publication on the mummy-bindings.

Isis.[97] Her title was very common during the New Kingdom,[98] and does not add any further clues concerning the dating of the coffin. The inscription on piece LHTT2260 is even more fragmentary and only a stroke is visible. The partly preserved column on the right side of the inscription accords with the ones on piece LHTT2295. The fragment's shape is very peculiar and shows a careful carving that could not be observed on any other object, neither from the excavation nor the comparative material.[99] This feature, as well as the rectangular edge of fragment LHTT2295, and the inscription band next to the edge do not fit with an anthropoid coffin, but they fit well with those of a rectangular object. The wall thickness of fragment LHTT2295 suggests a rectangular outer coffin rather than a box of some sort. If this assumption is true, CO2 would be the first rectangular outer coffin of the yellow type known to be used for a female burial. It would further imply that the original burial of Isis most likely contained an inner anthropoid coffin. Although no fragments of such a coffin have been found, fragments of a mask as well as the above-mentioned inscribed mummy-bands are of a similar style. It is thus quite likely that these burial items were created for the same owner and formed part of the same ensemble.[100]

3.5 Fragments of a Mummy-Mask (MASK4)

At the end of substructure TT 95C the remains of another mask were discovered (Fig. 1). The collation of MASK4 (Fig. 5), however, is more problematic. Although the large number of over fifty fragments seemed promising at the beginning, only the rear panel, the top of the head, a large part of the headband, and a small area of the collar could be reassembled; the face is completely missing. The mask was manufactured using three glued textile layers as a core. A textile band of approximately 4 cm in width was folded around the lower edge of the mask, overlapping 2 cm on the in- and outside, producing a smooth edge. The inner side was covered with a thin layer of muna[101] and a layer of white paste (ca. 0.2 cm). On the outer side two layers of stucco were applied (0.1 cm or less and 0.2 cm). The headband is tripartite, comprising (1) a middle band decorated with white petals that are red at their top and petals that are green, red, and blue; (2) an upper end consisting of a thin band with a decoration of black and white squares, and (3) a lower end again in the shape of a thin band that is left white and decorated with one line of black, and two lines of green, dots. At the back, the headband is interrupted by a triangle, possibly simulating the knotting.

At least one garland of the collar was executed in a style similar to the headband's middle part

97 Ranke 1935: 3, no. 18. The name Isis is very common during the New Kingdom.

98 Niwiński 1989: 80.

99 The vertical inscriptions on the sides of Khonsu's rectangular outer coffin (Cairo, Egyptian Museum JE 27302) are done on a separate corner post. A similar construction with corner posts can also be seen on the rectangular coffins of Sennedjem (Cairo, Egyptian Museum JE 27301) and Yuya (Cairo, Egyptian Museum CG 51001). However, the rectangular coffins of Thuya (Cairo, Egyptian Museum CG 51005) and Maihirpri (Cairo, Egyptian Museum CG 24001) show a construction without corner posts and it seems that different construction techniques were contemporarily in use during the 18th and 19th Dynasties.

100 See Loprieno-Gnirs 2009: 165, Abb. 18 and Haslauer 2016: fn. 33.

101 The muna layer may also be the remains of a temporary core, similar to the 22nd Dynasty cartonnages. See e.g., Adams 1966 and Krekeler 2007.

(Pl. 3). The thinner upper and lower bands, however, are missing and the petals show different proportions; i.e. they are thinner. The back lappet indicates a dating in the 18th Dynasty, whereas the floral headband with lotus blossoms at the front suggests that the mask was manufactured post-Amarna. Although exact parallels for both the CO2 rectangular coffin and MASK4 are missing, a dating contemporary with the early yellow coffins can be assumed, i.e. at the end of the 18th or early 19th Dynasty. This makes it rather likely that both objects belonged to the same burial. Based on the preserved fragments, it can be seen that both the rectangular coffin and the mummy-mask, have been very carefully manufactured. This also seems to support the assumption that they form parts of the same ensemble.

Fig. 5: Reconstruction of MASK4 (© University of Basel, LHTT-Project., hotos and drawing: Ch. Hunkeler, 2018).

4 Résumé

The study of the fragments of the two coffin ensembles, CO7.1, CO7.2 and MASK2, as well as a rectangular coffin CO2 and MASK4, has shown that it is necessary to closely inspect each fragment, to study the fragments of a group together, and to compare individual aspects of manufacture, decoration, and inscription with comparative material. While comparisons with intact examples allow a more precise picture of the original object, the examination of fragmentary material especially helps in understanding the manufacturing processes. The present study devoted to funerary equipment, of which only a very small percentage is preserved, has shown that it is possible to obtain an approximate reconstruction of the original objects, propose a rough dating, and provide a suggestion for burial ensembles. However, working with this small number of fragments also has its limits: the peculiar manufacture of the open-work technique has left many questions open, and the attribution of the CO2 fragments to a rectangular outer coffin remains a vague, but plausible, assumption.

The earlier of the two reconstructed burial ensembles, would appear to include a cartonnage mummy-mask, MASK4, of the short type with a long back lappet, and an outer rectangular coffin, CO2. Fragments of an anthropoid inner coffin, which one can presume was part of the original ensemble, were, however, not identifi-able in the investigated material. The mummy-mask most likely dates to the 18th Dynasty.

Long back lappets as seen on MASK4 are common during that and earlier periods but were no longer in vogue during the 19th Dynasty. During the Third Intermediate Period, mummy-masks were not part of the burial goods. The manufacture of the mask has been executed very precisely: the rim of the mask has been edged with an additional textile band. For the floral garland, Egyptian blue and green were used along with red colours. The proposed wooden rectangular coffin has no close parallel to give a more precise dating than from the post-Amarna period to the middle of the reign of Ramesses II. The polychrome inscription seems to be typical for the Ramesside Period, however, no sketching in red was undertaken and the outline of the hieroglyphs was applied in black. This style of applying the inscription may be an additional hint to date the coffin to the early phase of the yellow coffin type. The carpentry was accurate and the contours of the inscription band evenly carved. No filling material had to be used. The writing and filling of the hieroglyphs was done very precisely and also here Egyptian blue and green were used. The yellow seems to include, or consist completely of, orpiment and was varnished. The varnish is, however, not of the typical yellow resin, but a transparent one containing glue.

The second ensemble consists of a two-piece mummy-board (MASK2 and body-board CO7.2) and an inner anthropoid coffin (CO7.1). Both, the mummy-board and the anthropoid coffin seem to have been manufactured in the same workshop. With most fragments it is not clear whether they belong to the body-board or the coffin; even an assignment to the mummy-mask cannot be ruled out. The fragments of the anthropoid coffin contain enough of the decoration to find comparative material dating to the reign of Ramesses II. The outline of the preserved decoration and inscriptions were carried out in red and filled with white, red, blue, and green. The size of the registers approximately matches the ones of the inner coffins of Takayat and Tamutnefret. The image of a woman, most likely the deceased, in front of a seated deity again finds a parallel in the decoration of Takayat's inner coffin. The upper part of the two-piece mummy-board, the mummy-mask MASK2, shows similarity in craftsmanship to a mummy-mask exhibited in Basel. The inlays, the gilding and the style of the wig lappets remind one of Takayat's mask, and thus further strengthens the assumed dating to the reign of Ramesses II. Although the body-board shows the same decorative style as the fragments of the anthropoid coffin, the timbering of the open-work pattern is atypical for body-boards manufactured in wood. It is therefore argued that the technique was borrowed from the production of open-work cartonnages. However, no parallels for a similar wooden body-board have yet been discovered, therefore, the technique cannot be used for a more precise dating.

In conclusion, working with only scarce remains of objects, in this case funerary equipment, proved to be quite challenging, but very rewarding. The study of these tiny fragments has led to an approximate dating of the pieces, information about the deceased, and insights into the exceptional manufacturing techniques. Questions which still remain, such as more information on rectangular coffins of the yellow type and the peculiar open-work technique of the body-board CO7.1, may serve as a stimulus for fellow researchers to share their small, but valuable, fragments, leading to the discovery of parallels to our special cases – I am looking forward to this.

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Plates

Pl. 1: Fragment LHTT2186 from the anthropoid coffin CO7.1 with inscription (© University of Basel, LHTT-Project, photo: M. Kačičnik, 2019).

Pl. 2a: LHTT777 and LHTT778 from the open-work body-board CO7.2 (© University of Basel, LHTT-Project, photo: M. Kačičnik, 2018).

Pl. 2b: Fragments LHTT2295 and LHTT2260 from the rectangular outer coffin CO2. LHTT2295 with the inscription mentioning a part of the title and the name of the deceased (© University of Basel, LHTT-Project, photo: M. Kačičnik, 2018).

Pl. 3: Assembled fragments belonging to the collar of MASK4 (© University of Basel, LHTT-Project, photo: M. Kačičnik, 2018).

The topic of the international workshop “Excavating the Extra-Ordinary. Challenges and merits of workings with small finds” was the challenging task of working with seemingly ‘ordinary’ small objects and their processing. On this occasion in April 2019 at Johannes Gutenberg-University Mainz, experts from Egyptological excavations, museums and institutions presented and discussed current issues.

The present volume offers contributions held at the workshop, including the handling of vast amounts of material, fragmentary finds and methodological questions. The diversity of the discussed materials covers pottery, wooden and bone artifacts, as well as metal objects. Another focus lies on the scientific evaluation of insufficient early documentations and disturbed find contexts.

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