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More than people and pots: identity and regionalization in Ancient Egypt during the second intermediate period, ca. 1775-1550 BC

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More Than People and Pots

Universiteit Leiden

More Than People and Pots

*Identity and Regionalization in Ancient Egypt During
the Second Intermediate Period, ca. 1775–1550 BC*

PROEFSCHRIFT

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FOREWORD

This PhD dissertation is about the relationships between sites in Egypt during the Second Intermediate Period (ca. 1775 and 1550 BC). Back then, Egypt was politically and culturally divided, and it was characterized by the presence of groups from modern-day Syria-Palestine and Sudan that, as in the case of the Fifteenth Dynasty, managed to ascend to power. The late part of the Middle Kingdom (ca. 1850–1775 BC) has also been included in the analysis, for two reasons. Firstly, part of the features characterizing the Second Intermediate Period are already visible in the Late Middle Kingdom. Secondly, this allows us to better understand what changed between the Middle Kingdom, when Egypt was still politically united, and the Second Intermediate Period.

To study the relationships between the sites, the present author has analysed the material culture excavated from these sites through network analysis. This methodology is ideal to examine the relations, as well as the flow and circulation of objects, fashions, or knowledge, between different entities, based on what these entities have – or do not have – in common. The analysis is conducted through the use of digital tools to visualize the data through graphs, and to calculate mathematical measures.

Network analysis was born in the social sciences and has only recently been introduced into archaeology. While it has found applications in Mediterranean and European archaeology, its use in Egyptology is still limited. Only in a very few cases has network analysis been used to study particular documents or figures in Egyptian history; it has, until now, never been used to study Egyptian material culture. Hence, this PhD dissertation intends to introduce network analysis to Egyptian archaeology. The present dissertation hopefully demonstrates how useful network analysis can be, so that more people working in Egyptology and Egyptian archaeology will make use of it in the future. Lastly, given how recent the use of network analysis is in archaeology, methodological discussions about how to apply it to material culture are still ongoing; I hope that the present dissertation contributes to these discussions.

I am grateful to my promotor, Prof. Olaf Kaper, for all his good advice and helpful remarks. His kindness has been an inspiration, and he has always

brought out the best in me. I am especially thankful to my co-promotor, Dr Miriam Müller, for working so closely with me on this dissertation, and for the wealth of useful comments she has given me, for guiding me on this journey, and for always being there for me.

Naturally, I should like to thank the members of the Doctorate Committee: Prof. Caroline Waerzeggers (Leiden University), Prof. Peter Akkermans (Leiden University), and Dr Bettina Bader (Austrian Academy of Sciences). Thank you for taking the time to read the present dissertation and for your useful comments. I would like to thank Dr Bader also for the useful advice she gave me when I first embarked on the present project.

I should also like to thank other scholars for sharing their expertise and their time with me as I worked on this project. Firstly, Dr Johannes Preiser-Kapeller (Austrian Academy of Sciences), who has really helped me with regards to methodology, always with patience and kindness. Secondly, Dr Karin Kopetzky (Austrian Academy of Sciences) for her help with understanding the material included in the analysis and for hosting me on my first study-trip to Vienna. Thirdly, Prof. Manfred Bietak and Dr Silvia Prell, for allowing me to be a guest researcher with their research group The Enigma of the Hyksos and for helping me with selecting the material to analyse. My thanks also to Dr Aaron De Souza (Austrian Academy of Sciences) for his help with the dating of the Pan-grave cemeteries. And finally, my thanks to Dr Sarah Vilain (Université de Paris-Nanterre) for her help with the study of Cypriot pottery.

Naturally, the views expressed in this work are entirely mine, and I take full responsibility for any mistakes and errors that may inadvertently remain in the text.

Last, but not the least, there are no words to express how thankful I am to my husband, Josho Brouwers, who has stood by me over the years, with unconditional love, patience, and dedication. He has been the light in my darkest moments, and I could have not seen this project through to the end if he had not been there. This work is dedicated to him.

INTRODUCTION

The aim of the present research is to examine the relationships between the sites in Egypt during the Early Second Intermediate Period and the Late Second Intermediate Period (i.e. ca. 1775 and 1550 BC). To contextualize the changes in this period, the Late Middle Kingdom (ca. 1800-1775 BC) is also included in the analysis. The Second Intermediate Period is a highly dynamic period that is not yet fully understood. During the Late Middle Kingdom, namely the period including the Twelfth Dynasty and the first half of the Thirteenth Dynasty, even though the country was still united, an incipient regionalization is evident from the pottery. This is not entirely surprising because, while Egypt can at a first glance appear as a culturally united country, especially in the periods characterized by political unity such as the Middle Kingdom, the reality is more complex. Small regional variations can be identified in the archaeological record, especially when it comes to pottery, which is used in everyday life (i.e. cooking, consuming food, drinking, storing cosmetics, and as burial goods). However, is regional variation – or even a marked regionalization such as in the Second Intermediate Period – also visible when it comes to other types of objects?

During the Early Second Intermediate Period, the country was politically divided: while the Fourteenth Dynasty, which was probably of Levantine origins, held power in Lower Egypt, Tell el-Dab'a, the kings of the second half of the Thirteenth Dynasty held power in Upper Egypt, at least in the Theban area. During the Late Second Intermediate Period, the Fifteenth Dynasty, whose kings originated from the communities coming from Syria-Palestine, ruled in Lower Egypt, while the Sixteenth Dynasty and probably the Abydos Dynasty, followed by the Seventeenth Dynasty, ruled in Upper Egypt. It is not clear how the political situation affected communication and trade inside Egypt, and what the relationships between the different areas were. Along general lines, Lower Egypt is believed to have had influence, but not direct control, over the Memphis-Fayyum area, and to have maintained contacts with Upper Egypt, especially Edfu, through desert routes and by bypassing the Theban area, which is thought to have been hostile towards Lower Egypt.

The chronological and political issues related to the phases examined in this research are discussed in Chapter 2.

The Second Intermediate Period is believed to have been a period when the access to resources (and the networks in which they circulated) was limited, because political divisions isolated the different areas. However, access to material resources is also thought to have become more difficult already in the Late Middle Kingdom. Difficulty in accessing the resources, as well as the need to articulate new identities for the new political powers, are believed to be the reasons behind the regionalization of material culture that characterizes the Second Intermediate Period. This raises the question: how can we define a region? How can we use material culture to identify regions? Based on previous research, which regions can be detected in Egypt for the period analysed in this thesis? These questions are examined in Chapter 3.

During the Late Middle Kingdom and the Second Intermediate Period, communities from Syria-Palestine were not the only foreign ones living in Egypt. During the chronological phases examined in this thesis, people originally from Nubia were also present in Egypt. They include both the groups of the so-called Pan-grave culture and groups possibly from other areas in Nubia. These groups were present especially in Upper Egypt, even though their presence in Tell el-Dab'a has also been hypothesized, based on the pottery excavated at the site. Lastly, the presence of people from Cyprus has been hypothesized for Tell el-Dab'a. Did these communities play any special role when it came to defining the relationships between sites? If yes, how did they affect them? This is another question that the present research seeks to answer. However, studying ethnicity, especially when dealing with archaeological remains, is rife with problems, which are discussed in Chapter 4.

To shed more light on the relationships mentioned above, this study focuses on the analysis of different types of objects that are in common between different sites. The idea at the base of this analysis is that contacts established between sites are reflected in material culture, i.e. the types of objects found at these sites. The closer the contacts are between two or more sites, the more similar the material culture found at these sites is likely to be. In order to examine these similarities between sites, this study makes use of network analysis. Network analysis examines the relationships between several elements based on what they have in common. It relies on algorithms: the results are, first, graphs that help visualize the relationships and their entire network, and, secondly, the calculation of mathematical measures that analyse the role (or roles) of each element in the network. Network analysis is discussed in further detail in Chapter 5.

The groups of objects taken into consideration for the analysis are beads, scarab and seal designs, stone vessels, Tell el-Yahudiyah ware, Cypriot pottery,

and weapons. These objects have been chosen because they are consumption goods, i.e. products indicating and signifying status that show different aspects of the societies in which they were used. Each group of objects provides different information:

- Beads (Chapter 7), especially the ones of faience, as well as stone vessels (Chapter 8), were used by people not only of the upper class, but also of the middle class, therefore they can help understand the involvement of different segments of society in the networks.
- Scarabs and seals (Chapter 9) were used mostly in administrative tasks, but also as amulets. Therefore, on the one hand, they can show which sites were most involved in the administrative system and in the regulation of trade. On the other hand, they can also provide information on communities with similar cultural backgrounds when similar designs were used.
- Tell el-Yahudiyah ware (Chapter 10) and Cypriot pottery (Chapter 11) were at first imported but were later imitated locally. Therefore, while most pottery has not been considered in the present analysis and – for practical reasons – has been left for future research, Tell el-Yahudiyah ware and Cypriot pottery have been included because they can show relationships with foreign lands, especially Cyprus and Syria-Palestine, and/or the presence of foreign communities in Egypt, as well as the presence of traditions which were initially not ‘Egyptian’.
- Weapons (Chapter 12), which have been excavated nearly exclusively from funerary contexts, are informative of funerary traditions. They may also signify the presence of traditions different from the Egyptian ones.

Furthermore, the objects of stone and metal demonstrate which resources were used and, consequently, which geographical areas were involved in the circulation of these resources. The main features and sources of the materials, used to produce the objects examined in the analysis, are described in Chapter 6 of the present work. Chapter 13 discusses the circulation of these materials, as based on the results of the analysis, and what this may imply regarding the reconstruction of the chronological phases examined in this thesis. Conclusions are presented in Chapter 14, followed by appendices that present the results of the mathematical measures used in this analysis, as well as the examined archaeological contexts.

MATTERS OF CHRONOLOGY

The Second Intermediate Period separates the Middle Kingdom (the Eleventh, the Twelfth, and the first half of the Thirteenth Dynasty)¹ from the New Kingdom (Eighteenth to the Twentieth Dynasties). Contrarily to the political unity that characterized the Middle and the New Kingdoms, the Second Intermediate Period was a phase defined by political fragmentation and by the existence of different contemporaneous dynasties. The main dynasties involved in the politics of the Second Intermediate Period are the Thirteenth Dynasty (which initially ruled over the entire country, but later only reigned in over Upper Egypt), the Fourteenth Dynasty (which probably reigned over the Delta or at least over the eastern part of the Nile Delta), the Fifteenth Dynasty (which reigned in the eastern part of the Nile Delta and possibly also a larger territory), the Sixteenth and the Seventeenth Dynasties (which both reigned in the Theban region), and the Abydos Dynasty (which reigned over the region around Abydos). The Thirteenth and the Fourteenth Dynasty are considered to be part of the first half of the Second Intermediate Period, from now on called Early Second Intermediate Period, while the other dynasties are considered to be part of the second half of the Second Intermediate Period, from now on called Late Second Intermediate Period.

For the Early Second Intermediate Period, the exact sequence of kings and the lengths of their reigns are problematic for both the Thirteenth and the Fourteenth Dynasty, which were contemporaneous. It is also still a matter of debate if the Fourteenth Dynasty was contemporary with the entire Thirteenth Dynasty, or only to its second half. Furthermore, it is still not completely clear if the Fourteenth Dynasty was Egyptian or from the Levant. For the Late Second Intermediate Period, the main problems concern the Abydos Dynasty, whose existence has been proposed around twenty years ago, as well as the exact relations between this dynasty, the Sixteenth and the Seventeenth

¹ As discussed later, while most scholars assign only the second half of the Thirteenth Dynasty to the Second Intermediate Period, a hypothesis that assigns the entire Thirteenth Dynasty to the Second Intermediate Period has also been proposed.

Dynasty. It seems likely that the Sixteenth and the Abydos Dynasty coexisted before the Seventeenth Dynasty, but it is still not completely clear what exactly happened to the Abydos Dynasty and how the power went from the Sixteenth to the Seventeenth Dynasty. Furthermore, there are still unresolved problems that concern the Fifteenth Dynasty, known also as Hyksos dynasty, from the title *hqꜣ-hꜣswt* (“Rulers of foreign lands”) used by the first kings of the dynasty.² In particular, the issues that are still a matter of debate include the origins of the Fifteenth Dynasty, the identity and sequence of its first kings, as well as the territory ruled by this dynasty, are also still a matter of debate, though many data have been retrieved from the excavations in Tell el-Dab’a, located in the eastern Nile Delta. This site has been identified with Avaris, the capital city of the Fifteenth or Hyksos Dynasty, and is the most extensively excavated and studied site of the Second Intermediate Period.

In short, there is still much debate about the beginning of the Second Intermediate Period and the exact sequence of dynasties and events included in this period. There is also much discussion, though, about the absolute dates to which it can be anchored. While the point of transition between the Second Intermediate Period and the New Kingdom seems somewhat clear, the transition from the Middle Kingdom to the Second Intermediate Period is more problematic. Furthermore, during the Late Middle Kingdom – namely the phase starting with the kingdom of Senwosret III – some precursors of the Second Intermediate Period are already visible in the material culture, especially in the pottery; these precursors will be discussed in the next chapter. Many questions arise from the described situation. To when can the Second Intermediate Period and its phases be dated? What were the political developments of this period and the relations between the different dynasties? To which absolute years can we date the limits of this period and, consequently, the dynasties and the years of each king?

These are the questions that are discussed in this chapter. First, I am going to discuss what is known about the chronology and the political developments of the Second Intermediate Period, and the related problems. Secondly, I am going to describe the main sources for the reconstruction of the history and politics of this period. Lastly, I am going to give the general chronological frame that will be the reference for what is analysed in this dissertation.

2 It cannot be excluded that this title was used by all the kings of the Fifteenth Dynasty, because it was not simply imposed on them, but was consciously chosen by them, in a process of negotiating and defining their identity when interacting with Egyptian communities. This is discussed in detail and convincingly argued in: Candelora 2017.

The beginning of the Second Intermediate Period and the rise of the Fourteenth Dynasty

The Second Intermediate Period is considered to begin with the rise to power of the Fourteenth Dynasty in the north-eastern Nile Delta, which started a process of political fragmentation. When and why precisely the Fourteenth Dynasty rose to power, though, is still a matter of debate. According to one group of scholars, the rise to power of the Fourteenth Dynasty, thus the beginning of the political fragmentation and of the Second Intermediate Period, was contemporary with the second half of the Thirteenth Dynasty, after the reign of Merneferra Ay or around the reign of Sobekhotep IV.³ So far, this assumption seems confirmed by a number of facts. Firstly, Merneferra Ay is the last ruler of the Thirteenth Dynasty to be attested also outside Upper Egypt, especially in Lisht and Hawara.⁴ Secondly, more or less in the same period the activities appear to stop both in Lisht⁵ and in Dahshur,⁶ even though new evidence suggests that the site of Lisht was actually still occupied at the end of the Thirteenth Dynasty;⁷ it has recently been suggested that the rulers of the Thirteenth Dynasty did not abandon the Memphis-Fayyum area, but remained there also in the Early Second Intermediate Period, while in the Theban area the Sixteenth Dynasty, which was contemporary to the last part of the Thirteenth Dynasty, took power.⁸ Thirdly, stratum F in Tell el-Dab'a, dated to the middle of the Thirteenth Dynasty,⁹ seems to show the emergence of a number of phenomena, such as changes in burial customs, which could be connected to the rise of the Fourteenth Dynasty.¹⁰ According to Ryholt, however, changes that could be linked to the rise of the Fourteenth Dynasty are visible already in the early Thirteenth Dynasty.¹¹ Finally, the Royal Canon of Turin seems to present the Fourteenth Dynasty as a continuation of the Thirteenth, which could mean that the Fourteenth Dynasty rose in the late Thirteenth Dynasty.¹²

3 J.P. Allen 2010, 4; O'Connor 1997, 48–56; Redford 1997.

4 Bourriau 1997, 166; Bourriau 2010, 16; McCormack 2010, 69.

5 Bourriau 1997, 159.

6 Do. Arnold 1982, 51.

7 Bourriau 2010, 13.

8 As proposed by Ilin-Tomich 2014.

9 For more information on the dating of stratum F and of the other strata of Tell el-Dab'a: Bietak 1984a, 474–82; Bietak 1989b, 93–96; Bietak 1991; Bietak 2002, 37; Weinstein 1995, 87.

10 Bietak 1984a, 472–73; Bietak 1989b, 91–93; Bietak 2002, 29.

11 Ryholt 1997, 75–80.

12 J.P. Allen 2010, 5.

Ryholt¹³ has suggested that the Fourteenth Dynasty had seized power in the north-eastern Nile Delta already at the beginning of the Thirteenth Dynasty. This theory appears to be supported by several facts. Firstly, there is a group of scarabs and seal impressions found in the fortress of Uronarti, in Nubia, in a context believed to date to the first half Thirteenth Dynasty.¹⁴ Some of these scarabs belong to Djedkheperew (who belonged to the Thirteenth Dynasty and possibly reigned around 1772-1770 BC),¹⁵ while one belongs to Maaibra Sheshi (who belonged to the Fourteenth Dynasty and possibly reigned around 1745-1705 BC),¹⁶ which shows that Sheshi was contemporary with the first half of the Thirteenth Dynasty. Furthermore, given that this king would have had four predecessors, not registered in the Royal Canon of Turin but known through their scarabs and likely reigning before him on the basis of their scarabs' typology, then the dynasty would begin already in the early Thirteenth Dynasty.¹⁷ Secondly, Ryholt's theory is supported by the fact that the first kings of the Thirteenth Dynasty, between Sobekhotep I and Seth, were using filiative nomina, which could mean that they wanted to emphasize their legitimization, probably against a rising Fourteenth Dynasty.¹⁸ Moreover, finds from Tell el-Dab'a seem to witness the presence of people from the Levant that had an important role in the community already at the beginning of the Thirteenth Dynasty, probably as a consequence of the rise of the Fourteenth Dynasty.¹⁹ Among these finds, is noteworthy the statue of a man, found in area F/I in stratum d/2 and dated to the latest part of the Twelfth Dynasty, who wears Levantine types of clothes and hairstyle and has a yellow skin colour, usually used by Egyptians in art to represent people from the Levant.²⁰ But according to scholars like Schiestl,²¹ the group of tombs from which this statue comes simply belonged to persons of Levantine descent, who worked in the Egyptian administration and progressively became more Egyptianized. Lastly, Ryholt's hypothesis seems to be supported by the fact that a certain degree of regionalization in material culture appears already detectable in the early Thirteenth Dynasty.²²

13 Ryholt 1997, 75.

14 Bietak 2010, 113; Reisner 1955, 26; Ryholt 1997, 197–200. However, the context is less secure than previously thought: Ben-Tor, Allen, and Allen 1999; Moeller, Marouard, and Ayers 2011, 107–8; Müller 2018, 204–5.

15 Ryholt 1997, 197; Ryholt 2010.

16 Ryholt 1997, 200.

17 Ryholt 1997, 113–20.

18 Ryholt 1997, 296–97.

19 For this hypothesis: Ryholt 1997, 104.

20 For more information on the statue: Bader 2017, 21–22; Bietak 1997, 100; Schiestl 2006; Schiestl 2009, 75–89.

21 Schiestl 2009, 211–15.

22 Bourriau 1997, 159; Bourriau 2010, 11–12; Seiler 2010, 52.

The Late Second Intermediate Period

A new phase of the Second Intermediate Period is considered to start at the end of the Thirteenth Dynasty, when the Fifteenth or Hyksos Dynasty rose to power, filling the void left by the Fourteenth Dynasty. Scholars such as Ryholt still hold that the Hyksos were invaders.²³ However, the general consensus is that the coming of the Hyksos was not violent and that they emerged from the Asiatic population who were already living in the eastern Nile Delta.²⁴ This has also been very recently confirmed by new research.²⁵

Another main problem in reconstructing the history of the Second Intermediate Period concerns the relations between the Sixteenth, the Seventeenth, and the Abydos Dynasty. The latter is a dynasty that is known from archaeological finds and textual sources such as stelae, and that probably resided in Abydos, as hypothesized by Ryholt.²⁶ According to Ryholt, the Fifteenth Dynasty, the Abydos Dynasty, and the Sixteenth Dynasty all coexisted in the first part of the Late Second Intermediate Period, until the Fifteenth Dynasty occupied the territories of both the Sixteenth and the Abydos Dynasty. However, there is evidence against a Hyksos occupation of Upper Egypt.²⁷ Ryholt²⁸ has also suggested that, soon after these events, the Seventeenth Dynasty took power in the Theban region and, after a period of coexistence with the Fifteenth Dynasty, went to war against the latter. Also Allen,²⁹ Franke,³⁰ Marée,³¹ and Von Beckerath³² have hypothesized the existence of the Sixteenth Dynasty. However, these scholars are against adding the Abydos Dynasty to the reconstruction of the Late second Intermediate Period.³³ Moreover, according to Von Beckerath, the Sixteenth Dynasty lasted during the whole late Second Intermediate Period, together with both the Seventeenth and the Fifteenth Dynasty, and was a vassal dynasty of the latter in Middle and Upper Egypt. For other scholars,³⁴ neither the Sixteenth nor the Abydos Dynasty existed, but only a longer Seventeenth Dynasty that lasted for the whole Late Second

23 Ryholt 1997, 143–48.

24 Bader 2017, 26 – 27; Bietak 2010, 139–42.

25 <https://www.sciencemag.org/news/2020/07/invasion-ancient-egypt-may-have-actually-been-immigrant-uprising>

26 Ryholt 1997, 304–7.

27 Franke 2008, 278–79; Polz 2006.

28 Ryholt 1997, 133–37.

29 J.P. Allen 2010, 3–4.

30 Franke 2008, 275–77.

31 Marée 2010.

32 Von Beckerath 1964, 137–38, 220–21.

33 See particularly: Allen 2010, 4; Franke 2008, 277–78.

34 Bennett 2006, 230, 240–41; Miniaci 2010a; Miniaci 2011; O'Connor 1997, 48–56; Quirke 2004, 172–73.

Intermediate Period. Lastly, according to Ilin-Tomich, the Sixteenth Dynasty should be moved to the Early Second Intermediate Period.³⁵

Going to the end of the Second Intermediate Period, it is conventionally considered to be defined by the battles through which the last kings of the Seventeenth Dynasty, especially Seqenenra-Ta'a and his sons, Kamose and Ahmose I, reunified Egypt.³⁶ It is also not known what exactly happened to the Hyksos, and in general, the Asiatic population living in Avaris and in the rest of Egypt. It is possible that they just remained in Egypt also after the expulsion of the Hyksos kings, serving the new kings of the Eighteenth Dynasty.³⁷

SOURCES

The main sources to reconstruct the chronology of the Second Intermediate Period include the Royal Canon of Turin, the Aegyptiaca of Manetho, reports of the Sothic dates, scarabs, and radiocarbon dates. These and other sources and their problems are discussed in the following subsections.

The Royal Canon of Turin

The Royal Canon of Turin is a list of dynasties and kings from the First Dynasty to the end of the Second Intermediate Period and the beginnings of the New Kingdom. The list was written during the reign of Ramesses II or shortly after, on the verso of a papyrus hosted in the Turin Museum (inventory number 1874), while on the recto of the same papyrus a tax-list was recorded during the reign of Ramesses II.³⁸ The document is made up of eleven columns, each of which is composed of between 25 and 31 lines. Each line is reserved for one king, and only at the beginning and at the end of each dynastic break a line is used respectively for the heading and for the summation. The section dealing with the Second Intermediate Period begins in column 7, where the kings of the Thirteenth Dynasty and of the Fourteenth Dynasty are recorded, up to column 10. Then, in the last part of column 10, the kings of the Fifteenth Dynasty are named, while the kings of the Sixteenth Dynasty are reported in column 11. Lastly, the kings of the Abydos Dynasty can possibly be identified with the names registered in the last lines of column 11, while the

35 As discussed in Ilin-Tomich 2014.

36 Especially on the narration made by King Kamose, discussed in: Enmarch 2013; Flammini 2012; Habaši 1972; O'Connor 1997; Redford 1997; Säve-Söderbergh 1956; Smith and Smith 1976.

37 Bietak 2010, 171.

38 For further information on the history of the Royal Canon of Turin and its transmission: Ryholt 1997, 29–33; Ryholt 2004; Ryholt 2006, 26–27; Von Beckerath 1964, 20–26.

Seventeenth Dynasty could likely have been recorded in part of column 12, now lost. The Royal Canon of Turin probably had five previous versions, the first of which was compiled from five different sources dating up to the New Kingdom.³⁹ Already the second version had lacunae, which were transmitted down to the successive versions and which already from the third version were labelled as “lacunae” on the document itself and given a round number to avoid chronological gaps.⁴⁰

According to the interpretation of the Royal Canon of Turin proposed by Ryholt, the Thirteenth Dynasty included at least 51 kings, and the Fourteenth Dynasty likely had 56 kings. Six and fifteen kings can be respectively ascribed to the Fifteenth Dynasty and to the Sixteenth Dynasty, while sixteen kings would belong to the Abydos Dynasty.⁴¹ Other scholars have not agreed with the existence of neither the Sixteenth Dynasty nor the Abydos Dynasty, and have proposed the existence of only a long-two part Seventeenth Dynasty.⁴² Nevertheless, Ryholt has convincingly argued that his proposed rendition would allow to accommodate the Sixteenth Dynasty in the fifteen recorded entries of the Royal Canon of Turin, without having to postulate its existence as vassal dynasty of the Hyksos, while the entries for the Seventeenth Dynasty would simply be in a lost part of the Royal Canon of Turin.⁴³

Manetho

The *Aegyptiaca* was written by Manetho, a priest who lived during the reign of Ptolemy II Philadelphus, in the 3rd century BC. This work has not survived to the present day, but it has been transmitted to us through other authors who have mentioned or quoted it. The first of these authors is Flavius Josephus, who in the first century AD reported the *Aegyptiaca* in his work *Contra Apionem*, mentioning in particular, as far as the Second Intermediate Period is concerned, six Hyksos kings and how they reigned for 240 years after having invaded Egypt.⁴⁴ The second is Sextus Julius Africanus, who in the third century AD preserved part of the *Aegyptiaca* in his work *Chronographiai*. The third is Eusebius of Caesarea, who lived in the fourth century AD and transmitted part of the *Aegyptiaca* in his work *Chronicon*. In both the transmissions of the *Aegyptiaca* by Eusebius and Africanus there is also a section about the dynasties of the Second Intermediate Period, which has arrived to the modern

39 Ryholt 1997, 31–33; Ryholt 2004, 145–46; Ryholt 2006, 28.

40 Ryholt 1997, 10–12; Ryholt 2004, 146–48.

41 For this reconstruction and interpretation: Ryholt 1997, 69–75, 94–99, 118–19, 151–71.

42 Bennett 2002, 124–32; Bennett 2006, 232–34; Miniaci 2010a; Miniaci 2011; Quirke 2004, 172–73; Schneider 2006, 181–92.

43 Ryholt 1997, 151–52.

44 Redford 1997, 77.

day through the work of George Syncellus, who lived between the late eight and the early ninth century AD and quoted both Africanus and Eusebius in his work.⁴⁵

Both the transmissions by Africanus and Eusebius ascribe 60 kings, who reigned for 453 years, to the Thirteenth Dynasty, and 76 kings, who reigned for 184 years, to the Fourteenth Dynasty. For the remaining dynasties of the Second Intermediate Period, though, there are discrepancies between the two transmissions. Nevertheless, it can be said that the original version of the *Aegyptiaca* reported six kings for the Fifteenth Dynasty, who reigned for 260 years, while the Sixteenth Dynasty and the Seventeenth Dynasty were respectively made up of 32 and 5 kings, who all together reigned for 251 years.⁴⁶

The Sothic dates

The dates based on the heliacal rising of Sirius and the Sothic cycle (i.e. based on the annual return of Sirius in the night sky) have been used to determine the absolute dates for the Second Intermediate Period. Recently, new calculations have been proposed that take into account how these observations may have been influenced by the place from which the stars were observed and atmospheric conditions, and how, as a consequence, these could influence our own calculations.⁴⁷ Two events are important for the Second Intermediate Period. The first one is the heliacal rising of Sirius noted in year 7 of Senwosret III, and registered in a letter copied in a diary of the temple of Lahun.⁴⁸ According to a group of scholars, this event should be dated between 1872 and 1830 BC,⁴⁹ and preferably towards 1866 BC,⁵⁰ fixing the beginning of the Thirteenth Dynasty to around 1800. According to other scholars, this event should be dated not later than between 1890 and 1860, setting the beginning of the Thirteenth Dynasty twenty or thirty years earlier.⁵¹ The second date is the heliacal rising of Sirius recorded in the year 9 of Amenhotep I and written on Papyrus Ebers.⁵² This event should be dated between 1544 and 1506 BC, setting the fall of Avaris, dated to the year 11 or 15 of the reign of Ahmose and

45 For the transmission and interpretation of the *Aegyptiaca*: Bennett 2006, 232; Schneider 2008, 23-24; Von Beckerath 1964, 11-20.

46 J.P. Allen 2010, 3; Bennett 2006, 232; Bietak 1984a, 472-73; Redford 1997, 77; Schneider 2008, 23-24; Von Beckerath 1964, 11-20.

47 Gautschy 2011b.

48 For more information: Gautschy 2011a, 10-12; Gautschy 2011b, 124-25; Luft 2006, 310.

49 Bennett 2006, 236; Bietak 1991, 48-49; Bietak 2002, 29.

50 Bietak 1989b, 91-93; Luft 2006, 314.

51 Schneider 2008.

52 Bennett 2006, 236; Bietak 1984a, 472; Bietak 1989b, 91; Bietak 1991, 47; Gautschy 2011b, 125.

meaning the end of the Second Intermediate Period, between 1577 and 1539 BC.⁵³

The Sothic dates allow altogether a length of 200 or 250 years for the Second Intermediate Period. This length, though, seems too short and does not allow us to accommodate all the certain or reasonable lengths of the dynasties. To solve this problem, both Krauss and Luft developed chronologies based on the lunar dates from Lahun, which would allow a higher chronology and a longer time span for the Second Intermediate Period.⁵⁴ More recently, new studies that compare the lunar dates and the known heliacal rising of Sirius have been published, which confirm the year 1866 BC as the more probable for the heliacal rising of Sirius of year 7 of Senwosret III.⁵⁵ Another solution was proposed by Bennett,⁵⁶ who suggested to use the genealogy of the governors of El-Kab, as reconstructed from the inscriptions in their rock-cut tombs; the genealogy of these governors is discussed more in detail later. This would imply that the Sothic date of Amenhotep I is not taken into consideration anymore, and that the Fifteenth Dynasty and Seventeenth Dynasty both rose together to power after the end of the Thirteenth Dynasty, so removing the existence of the Sixteenth Dynasty.⁵⁷

However, all these methodologies present many problems. At present, the best solution seems to be the adoption of a higher and long chronology for both the Middle Kingdom and the Second Intermediate Period, as proposed by Schneider.⁵⁸ According to him, the beginning of the Twelfth Dynasty can be dated to around 2025 or 1990 BC, while the beginning of the Thirteenth Dynasty can be dated to around 1845 or 1820 BC. This gives a period of around 180 years to the Middle Kingdom, while giving to the Second Intermediate Period a length of around 305 years, if one considers that the Thirteenth and the Seventeenth Dynasty do not overlap, or 270 years, if one considers that the two mentioned dynasties do overlap. This reconstruction would also accommodate the information found in the Manethonian tradition.

The scarabs

Concerning the Second Intermediate Period, scarabs have been used to reconstruct the dating and the sequence of kings of the Fourteenth Dynasty, where many kings are attested only through these objects. The beginning of this dynasty around 1800 appears indeed confirmed by the scarabs in the

53 Bennett 2006, 236; Bietak 1984a, 472; Bietak 1989b, 91–93; Bietak 1991, 47–48.

54 Krauss 2003; Luft 2006.

55 Gautschy 2011a.

56 Bennett 2002; Bennett 2006.

57 Bennett 2006, 240–41.

58 Schneider 2008.

Uronarti context, mentioned earlier. According to the seriation of the scarab of the Fourteenth Dynasty, the first king of the Fourteenth Dynasty was Sekhaenra Yakbim,⁵⁹ while the last king for whom both praenomen and nomen are known is Nehsy, who is attested on scarabs and on architectural remains in Tell el-Dab'a and in the eastern Nile Delta. Contemporary to his attestations is also a noticeable spread of Levantine culture that, though it cannot prove Levantine origins for Nehsy, shows that he belonged to a new dynasty that was supported by Levantine people.⁶⁰ Lastly, a group of scholars has attributed Sheshi to the Fifteenth Dynasty, so that the Uronarti context assumes another meaning.⁶¹ Nevertheless, Ryholt has demonstrated that both Sheshi and Yaqubhor are to be ascribed to the Fourteenth Dynasty.⁶²

The seriation of scarabs has been used also to reconstruct the sequence of the kings of the Fifteenth Dynasty, especially as far as the position of the reign of Khayan is concerned. This king has been situated in the second half of the dynasty,⁶³ though new sealings from Edfu, ascribed to this king and found together with sealings of Sobekhotep IV in a large building with columned halls,⁶⁴ appear to suggest a position earlier in the dynasty, and even that the Fifteenth Dynasty could have started earlier than the end of the Thirteenth Dynasty.⁶⁵ However, there is the possibility that the sealings of Khayan are not contemporaneous with the sealings of Sobekhotep IV.⁶⁶

The radiocarbon dating

Radiocarbon dates from Tell el-Dab'a have caused heated discussions, because they give a dating for each stratum that is around 120 years older than the dating given through other archaeological evidence and historical links.⁶⁷ These discrepancies in the radiocarbon data from Tell el-Dab'a have been explained through regional variances in ¹⁴C-depleted CO₂, caused by the proximity to the sea and to mixed situation of sea and fresh water, such as the Nile Delta.⁶⁸

Nevertheless, more and more archaeological evidence and radiocarbon dates from the Levant, from sites such as Tell el-Burak and Tell Ifshar, seem to confirm the radiocarbon dates from Tell el-Dab'a, and suggest that the chro-

59 Ryholt 1997, 94–99.

60 Bietak 1984b; Bietak 1997, 108–9; Bietak 2002, 36.

61 Ben-Tor 2010, 94–97; Tufnell 1975, 69–70; Tufnell, Martin, and Ward 1984.

62 Ryholt 2010.

63 Krauss 1996; Ryholt 1997, 119–23; Von Beckerath 1964, 127–37, 223.

64 Moeller 2009; Moeller 2010; Moeller 2012; Moeller, Marouard, and Ayers 2011.

65 See the scarabs from Tell el-Dab'a and Edfu discussed in: Moeller, Marouard, and Ayers 2011; Sartori 2009.

66 Ilin-Tomich 2014, 149–52.

67 Kutschera et al. 2012.

68 Hagens 2014.

nology used so far is too low and should be higher.⁶⁹ This would also fit with the chronological reconstruction proposed by Schneider.

Further sources

Three written sources need to be mentioned that date from the Second Intermediate Period and which may help us reconstruct the history of the period. The first consists of a group of inscriptions in El-Kab, inscribed in the rock-cut tombs of three governors who were active between the Late Second Intermediate Period and the Early New Kingdom: Renseneb⁷⁰ and Sobeknakht II,⁷¹ who were active during the Sixteenth⁷² or Seventeenth⁷³ Dynasty, and Reneny,⁷⁴ who was active during the Eighteenth Dynasty. These inscriptions tell us about the family members and the ancestry of these governors. Hence, it is possible to reconstruct a genealogy, which in the case of Renseneb's wife goes back to King Neferhotep I, of the Thirteenth Dynasty.⁷⁵ Renseneb and Sobeknakht II belonged to two different branches of the same family, branches which have as common ancestor Aya, governor of El-Kab and then vizir under King Merhotepra (probably Merhotepra Ini), of the Thirteenth Dynasty.⁷⁶ Members of this family are mentioned on the so-called Juridical Stela from Karnak.⁷⁷ This stela is dated to King Nebiryrau I, who probably was the sixth king of the Sixteenth Dynasty.⁷⁸ It records the transfer of the Elkab governorship to Sobeknakht II's father, also called Sobeknakht,⁷⁹ mentioning his ancestry up to Aya; Sobeknakht II himself probably became governor under one of the immediate successors of Nebiryrau I.⁸⁰ Lastly, Reneny was Sobekhotep II's son and became governor during the reign of Amenhotep I, as can be reconstructed from the inscriptions in Reneny's tomb and from a graffito left by the same Reneny in Sobeknakht II's tomb.⁸¹ Combining the data from the tombs and from the stela can help in reconstructing the chronology of the

69 Höflmayer et al. 2016.

70 Davies 2010, 225-29.

71 Davies 2010, 229-34.

72 Following Davies (2010) and Ryholt (2002).

73 Following Bennett (2002).

74 Davies 2010, 235-37.

75 Bennett 2002, 133-39; Davies 2010, 229.

76 Bennett 2002, 124; Davies 2010, 224.

77 Bennett 2002, 124-26 and 288; Ryholt 1997, 389; von Beckerath 1964, 181-83.

78 Davies 2010, 224-25 and 234-35; Ryholt 1997, 151-59; however, Bennett considers this king as belonging to the Seventeenth Dynasty: Bennett 2002, 225.

79 Bennett 2002, 224-25; Davies 2010, 224-25.

80 Davies 2010, 225.

81 Davies 2010, 235-37.

period between the end of the Middle Kingdom and the early part of the New Kingdom.

The other two sources tell us mostly about the end of the Second Intermediate Period and of the Fifteenth Dynasty: the Second Stela of Kamose and the inscription in the tomb of Ahmose, son of Abana. The Second Stela of Kamose is the second of two stelae dedicated by the king at Karnak. Fragments of the First Stela were re-used as building material in the foundations of Pylon III to the east of the Great Hypostyle Hall, likely during the reign of Amenhotep III.⁸² Part of its text has been copied on one side of the so-called Carnarvon tablet, a writing tablet found in the courtyard of a tomb in Thebes; the other side contained an excerpt from the Teaching of Ptahhotep.⁸³ The Second Stela was found as a later reusage in the foundations of a statue of Ramesses II in front of Pylon II.⁸⁴ It is possible that the First Stela stood in a sanctuary, and that the second one, with a twin, framed a pylon.⁸⁵ It is also possible that the first stela contained the entire text of the narration, the same that was divided between the second stela and its twin.⁸⁶ However, it is clear that the three texts belong to the same narrative.⁸⁷ The narration on the stelae informs us on the military campaign that the king, in his third year of reign, conducted northward, against Apepi, ruler of the Fifteenth Dynasty.⁸⁸

The campaign against the Hyksos was completed by Ahmose I, successor of Kamose and founder of the Eighteenth Dynasty. The success of Ahmose I's army and the fall of Avaris are narrated by inscriptions in the tomb of Ahmose, son of Abana, at El-Kab. The text is an autobiography of the owner of the tomb, a soldier, who was himself son of a soldier who had served in the army of Seqenenra Ta'a, and who took part in the Battle at Avaris and at the Siege of Sharuhén, in modern-day Palestine. He then kept serving under Ahmose I, and under his successors Tuthmosis I and Amenhotep I, accumulating rewards for his deeds.⁸⁹ Sharuhén was, according to the inscription, the reign where the Hyksos fled from Avaris. According to the archaeological evidence presented by Oren,⁹⁰ Sharuhén was the centre of the southernmost of three main reigns in Canaan; it connected Egypt and southern Canaan, and

82 Enmarch 2013, 254; Smith and Smith 1976, 49.

83 Enmarch 2013, 254; Smith and Smith 1976, 49.

84 Enmarch 2013, 254; Habašī, 1972, 16-31; Smith and Smith 1976, 49.

85 Habašī, 1972, 16-31; Smith and Smith 1976, 49-50.

86 Smith and Smith 1976, 50.

87 Enmarch 2013, 254-55.

88 Colin, 35-41; Dirminti 2014, 242-43; Enmarch 2013, 56-63; Flammini 2012, 55-64; Habašī, 1972, 31-55; O'Connor 1997; Säve-Söderbergh 1956; Smith and Smith 1976, 50-66 and 69-74.

89 The inscription is discussed in: Lichtheim 2006, 11-12; Redford 1997, 70.

90 Oren 1997.

it played an important role for the Hyksos kingdom in Egypt. However, no other written sources mention it.⁹¹

THE DYNASTIES OF THE SECOND INTERMEDIATE PERIOD

The main dynasties of the Second Intermediate Period are the Thirteenth through Sixteenth Dynasty, the Abydos Dynasty, and finally the Seventeenth Dynasty. These dynasties are briefly discussed in the following subsections.

The Thirteenth Dynasty

The first dynasty to be totally or partially a part of the Second Intermediate Period is the Thirteenth Dynasty. This dynasty included at least 51 kings, recorded in the Royal Turin Canon,⁹² plus another five⁹³ or eleven⁹⁴ kings that are not named in the document, but who are known from other sources, such as statues and inscriptions.⁹⁵ This is about the same number mentioned by Manetho. Chronologically speaking, it is generally accepted that the kings of the Thirteenth Dynasty reigned between 1803 and 1649 BC,⁹⁶ possibly starting with the reign of Sobekhotep I.⁹⁷ In the Royal Canon of Turin, this king is recorded in the second half of the Thirteenth Dynasty, while Wegaf Khutawyre is mentioned as first king, but the typology of their scarabs seems to show that Sobekhotep I was the first king of the dynasty. If this is really the case, the entry in the Royal Canon of Turin was probably incorrect.⁹⁸

The remaining history of this dynasty is also a matter of some debate. According to one possible reconstruction, proposed by Ryholt,⁹⁹ and followed by Franke,¹⁰⁰ it can be divided into four phases. In the first phase, between the reigns of Sobekhotep I and Seth, the dynasty kept access to resources because of commercial and diplomatic agreements with the rising Fourteenth Dynasty. In the second phase, between the reign of Sobekhotep III and Sobekhotep V, the kings emphasized their non-royal descent, while at the same time people of lower classes rose to high ranks and offices, and many of them

91 Hoffmeyer 2004, 27-28.

92 Ryholt 1997, 69-75; Von Beckerath 1964, 31-71.

93 Ryholt 1997, 72.

94 J.P. Allen 2010, 1.

95 An overview of this dynasty is given in: Franke 2008, 270-73; Schneider 2006, 175-81. However, the sequence of kings proposed by the two authors is different.

96 Bietak 1984a, 472-73; Bietak 1989b, 91-93; Quirke 2004, 171; Ryholt 1997, 190-97; Von Beckerath 1964, 222-23.

97 Franke 2008, 270; Ryholt 1997, 243.

98 According to Ryholt: Ryholt 1997, 190. Contra: Schneider 2006, 175-79.

99 Ryholt 1997, 296-99.

100 Frank 2008, 270-73.

became seal-bearers, directly representing the king through his seals. In the third phase, between the reigns of Sobekhotep VI and Aya, both the production of the royal genealogical types of seals, namely royal seals mentioning either the maternal or paternal affiliations, and the monumental production decreased markedly. The fourth and last phase, corresponding to the last 24 kings, was characterized by the total collapse of the dynasty, though some important families managed to keep power.

According to another reconstruction, suggested by Quirke¹⁰¹ and based on the analysis of the power of the Thirteenth Dynasty through the written attestations of the kings and the members of the court, the phases of this dynasty are divided differently. The first one of these phases was characterized by many kings with very short reigns, while the second one had kings with longer reigns, and the last one featured again kings with short reigns and is attested mostly in the Theban region. From this analysis it would also appear that the Thirteenth Dynasty did not proceed through blood line and primogeniture rights, but that the king was more or less in turn chosen from among the elder members of the court and families of highest rank. Thus, the first phase represents the novelty after the end of the Twelfth Dynasty, when the members of the court did not know yet how to deal exactly with the throne succession, while the second phase represents a moment when the succession mechanism had been figured out, and the third phase was the moment when the system of succession proved weak and the country was divided. An analysis of the material and size of royal statues as means of expressing power, recently conducted on the statues of the Thirteenth Dynasty, suggests a similar division.¹⁰²

Both theses agree on the fact that the last part of the Thirteenth Dynasty was very problematic, as seems supported by the relatively poor royal tombs in Dahshur, Saqqara, and Mazghuna, which show that the kings of the Thirteenth Dynasty wished to continue the funerary traditions of the Twelfth Dynasty, but they clearly lacked the necessary resources.¹⁰³

The Fourteenth Dynasty

It has already been mentioned how the dating for the beginning of the Fourteenth Dynasty is problematic.¹⁰⁴ If one follows the theory according to which this beginning is contemporary with the beginning of the Thirteenth Dynasty, then it can be dated between 1805 and 1649 BC.¹⁰⁵ Otherwise, if one follows

101 Quirke 1991.

102 Quirke, D'Amico, and Picchi 2010.

103 McCormack 2010.

104 Franke 2008, 274-75.

105 Ryholt 1997, 75, 190-91, 198-200, 321-22.

the other hypothesis, then the Fourteenth Dynasty began around the middle of the Thirteenth Dynasty and should be dated between 1700 and 1650 BC.¹⁰⁶

The exact history of the Fourteenth Dynasty is also a matter of debate. According to one reconstruction, the first part of this dynasty, including its first five kings between Yakbim and Sheshi (1805-1705 BC), seems to have been more stable, because the total sum of their reigns amounts to a century. The second part of the Fourteenth Dynasty, with the reign of Nehsy and his successors (1705-1649 BC) was more unstable, like the contemporary part of the Thirteenth Dynasty, probably because famine and epidemics affected the country,¹⁰⁷ weakening both dynasties until they lost power completely.¹⁰⁸

Another problem connected to this dynasty is the territory over which they exerted power.¹⁰⁹ While it is accepted that these kings ruled in the north-eastern part and that at least a few of them probably resided in Tell el-Dab'a, it is assumed that they could be present also in other parts of the Nile Delta, in a territory up to Athribis and Bubastis.¹¹⁰

Lastly, it is also debated if the Fourteenth Dynasty was of Egyptian or Asiatic or multiple origins.¹¹¹ According to Ryholt¹¹² it was of Asiatic origins, because of the west-Semitic roots of the names used by the kings that he ascribes to the dynasty. Conversely, other scholars state that this dynasty was not of Asiatic origins, but only maintained relationships with the Asiatics,¹¹³ and that the trend in the use of Asiatic names was due to intermarriages gradually increasing with the growing Asiatic population in the Delta.¹¹⁴

The Fifteenth Dynasty

The Fifteenth Dynasty probably consisted of six kings.¹¹⁵ It can be noted that only the first four kings of this dynasty used the title *hq³-h³swt*, while Khayan used both this title and the Egyptian royal titles, and the other two kings used only the Egyptian royal titles. According to Ryholt, this derives from the fact

106 Bietak 1984a, 472-73; Bietak 1989b, 91-93; Bietak 2002, 29; Quirke 2004, 171-72; Von Beckerath 1964, 86-94, 223.

107 Bietak 1985, 336; Bietak 1996, 7; Bietak 1997, 105; Bietak 2010, 163; Ryholt 1997, 299-300.

108 For the history of the Fourteenth Dynasty as described here: Ryholt 1997, 299-300.

109 Franke 2008, 273-74.

110 For the territory of the Fourteenth Dynasty: Ryholt 1997, 103-5; Von Beckerath 1964, 93-97.

111 Franke 2008, 273-74.

112 Ryholt 1997, 96-99.

113 J.P. Allen 2010, 2; Bietak 1997, 108-9; Bietak 2002, 36.

114 J.P. Allen 2010, 5.

115 Bietak 1989b, 91-93; Ryholt 1997, 118-23; Schneider 2006, 192-95; Von Beckerath 1964, 127-37.

that these kings had managed to conquer territories of Upper Egypt, up to Abydos.¹¹⁶ However, the use of the title *ḥqꜣ-hꜣswt* is more complex, and reflects a conscious choice in a process of negotiation of identity.¹¹⁷ While it is generally accepted to date the Fifteenth Dynasty between 1649 and 1540 BC,¹¹⁸ and to consider Hotepibra Khamudi (reigned 1540-1541 BC) the last king of this dynasty, it is still not completely clear who the first king of the dynasty was.

Another problem concerns the origins of this dynasty. Both from the features of their material culture and from the written sources, it is known that the dynasty was of Asiatic descent, but a more precise point of origin has not been determined yet. From what appears from the names of the kings, they probably were of Western Semitic or Canaanite origins,¹¹⁹ but from their material culture it would seem more likely that they came from the Northern Levant.¹²⁰

The territory of the dynasty is also debated. It is generally agreed upon that the territory included the eastern Nile Delta, namely the same territory ruled by the Fourteenth Dynasty,¹²¹ with the main residence still in Tell el-Dab'a. Nevertheless, according to Ryholt's reconstruction, which considers the Hyksos contemporary with the entire Thirteenth Dynasty, it is possible that by the end of the Thirteenth Dynasty the Hyksos kings had managed to expand their power over Memphis and, from the reign of Neferhotep III of the Sixteenth Dynasty, over Abydos and the territory up to Thebes. From there, this dynasty would have been chased away by the kings of the Seventeenth Dynasty. However, as already mentioned, the evidence attesting to the presence of Hyksos rulers in Upper Egypt does not support this hypothesis.¹²²

The Sixteenth Dynasty

The dating of the Sixteenth Dynasty is also a matter of debate. The beginning of this dynasty was probably contemporary with the one of the Fifteenth Dynasty, while its end has more possibilities for dating. If one hypothesizes that the Sixteenth Dynasty preceded the Seventeenth Dynasty,¹²³ than its end

116 Ryholt 1997, 123–25.

117 As discussed in: Candelora 2017.

118 Bietak 1984a, 472–73; Bietak 1989b, 91–93; Ryholt 1997, 186–88, 201; Von Beckerath 1964, 127–37, 223.

119 Ryholt 1997, 125–30.

120 As discussed in: Bietak 2010.

121 For these hypotheses: Ryholt 1997, 130–37.

122 This evidence is discussed in detail in: Polz 2006.

123 Ryholt 1997, 189, 201–2.

would be dated to 1582 BC, while it would be dated to ca. 1550 BC if one theorizes that the Sixteenth and the Seventeenth Dynasty were contemporary.¹²⁴

The history of the Sixteenth Dynasty is not easy to reconstruct either. According to Ryholt's interpretation, it probably began with the one-year reign of a king whose name is now lost, while the first king to be attested is Sekhemresematawy Djehuty, who reigned between 1648 and 1645 BC.¹²⁵ The last king attested for this dynasty is Sekhemreshedwaset, who reigned in 1588 BC, while the successive part of the dynasty is not clear at present, but it was possibly made up of five kings, whose names and length of reigns cannot be precisely retrieved.¹²⁶ Furthermore, Ryholt has hypothesized the Sixteenth Dynasty as residing in Thebes and reigning over the area around it, between Hu and Edfu, before the Seventeenth Dynasty took power in the region.¹²⁷ Nevertheless, there is the possibility that this dynasty was actually ruling from the area of Abydos, and that the archaeological finds associated with the Abydos Dynasty have actually to be ascribed to the Sixteenth Dynasty.¹²⁸

The Abydos Dynasty

According to Ryholt, who has hypothesized the existence of an Abydos Dynasty, this dynasty of sixteen kings included part of the names traditionally attributed to the Sixteenth Dynasty. Some names, not mentioned in the written sources, can be retrieved in other contemporary sources and, mostly, in monuments found in the region of Abydos.¹²⁹ Ryholt has dated the Abydos Dynasty between 1649 and 1629 BC¹³⁰, and has calculated that each one of its kings reigned for a period between two and four years. Furthermore, he has theorized that the territory of these kings was in the region of Abydos, probably up to Beni Hasan, and that their residence would be in Abydos itself or in its vicinity.¹³¹

Moreover, during excavations at Abydos South a group of tombs has been found, that could belong to the Abydos Dynasty, as suggested by its features.¹³² First, the only name known for the owners of these tombs, Woseribra Seneb-Kay, has parallels with the names partially reported on column 11 of the Royal Canon of Turin, in the section that Ryholt believes to correspond to the

124 Von Beckerath 1964, 20–26, 224.

125 Franke 2008, 275; Ryholt 1997, 152–54.

126 For this reconstruction: Franke 2008, 276; Ryholt 1997, 151–59.

127 For this theory: Ryholt 1997, 159–60.

128 Ilin-Tomich 2014, 145–46.

129 Ryholt 1997, 163–67.

130 Ryholt 1997, 191, 202–3.

131 For the Abydos Dynasty: Ryholt 1997, 163–66.

132 Wegner 2015, 76–77.

Abydos Dynasty.¹³³ Second, the pottery and the spatial relations with tombs of the Middle Kingdom suggest that the tombs of this particular group were made shortly after the Thirteenth Dynasty.¹³⁴ Third, the architectural and iconographical features of these tombs have parallels in the tomb chapels dated to the mid-Sixteenth Dynasty in Hierakonpolis and El-Kab.¹³⁵ Lastly, particular wounds and traumas have been detected on Seneb-Kay's body and on other bodies found in these tombs, which suggest that these persons rode horses and engaged in battles, possibly against the Hyksos, or against the kings of the Sixteenth Dynasty, or even against Nubians.¹³⁶

The Seventeenth Dynasty

The Seventeenth Dynasty included around eight,¹³⁷ nine,¹³⁸ or ten kings,¹³⁹ or alternatively sixteen¹⁴⁰ or fifteen kings.¹⁴¹ There are more possibilities to date this dynasty. If one accepts the existence of the Sixteenth and the Abydos Dynasty,¹⁴² it can be dated between 1580 and 1549 BC, while it can be dated between 1650 and 1550 BC if one does not accept the existence of the Sixteenth Dynasty or, like Von Beckerath,¹⁴³ hypothesizes that both the Sixteenth and the Seventeenth Dynasty were entirely contemporary with the Fifteenth Dynasty. According to the first one of these hypotheses, the Seventeenth Dynasty started with the reign of Sekhemrewahkhau Rahotep, between 1580 and 1576 BC.

Because of the written records of the campaigns that led to the defeat of the Hyksos,¹⁴⁴ there is more certainty about this dynasty's last part, beginning with the reign of Wadjikheorra Kamose between 1554 and 1549 BC. It is also known that under the reign of his successor, Ahmose, Avaris fell to the army of these Theban kings, after a period of war, bringing the end of the Second Intermediate Period.¹⁴⁵ Despite this war, the Seventeenth Dynasty was at first

133 Wegner 2015, 72.

134 Wegner 2015, 69–71.

135 Wegner 2015, 71–73.

136 Hill, Rosado, and Wegner 2017; Wegner 2015, 73–76.

137 Franke 2008, 279.

138 Polz 2007, 29–59; Polz 2010, 343–45; Polz 2018, 217–18.

139 Ryholt 1997, 167–71.

140 J.P. Allen 2010, 3.

141 Von Beckerath 1964, 169–95.

142 Ryholt 1997, 189–90, 203–4.

143 Von Beckerath 1964, 224.

144 The stelae with the records are discussed in: Colin 2005, 35–41; Dirminti 2014, 242–43; Enmarch 2013, 56–63; Flammini 2012, 56–64; Habaš 1972, 31–55; O'Connor 1997; Redford 1997, 68–69; Ryholt 1997, 119–23; Säve-Söderbergh 1956; Smith and Smith 1976, 50–66 and 69–74.

145 Ryholt 1997, 167–71.

probably living in peace with the Fifteenth Dynasty.¹⁴⁶ The northern stronghold of the Seventeenth Dynasty seems to be still Abydos, while towards the end of the Dynasty, it went progressively more north, and because resources could be spent in building activities in Medamud, Koptos, Deir el-Ballas, and Abydos.¹⁴⁷

It is also known that the territory ruled by this dynasty had its centre in Thebes, but its exact extension is not known. According to one reconstruction, it extended up to Abydos after this dynasty reconquered the city from the Fifteenth Dynasty.¹⁴⁸ The royal attestations discussed by Polz show, however, that the southern border was probably at Edfu, at least until the end of the dynasty.¹⁴⁹

CONCLUSIONS

In this dissertation, the Second Intermediate Period is considered to start with the rise of the Fourteenth Dynasty, which is regarded to begin in the second half of the Thirteenth Dynasty. Even though the interpretation proposed by Ryholt, which sets the beginning of the Fourteenth Dynasty in the very early Thirteenth Dynasty, seems plausible and is well argued, there is still too much debate to fully embrace it. Furthermore, in this dissertation the Second Intermediate Period is divided into an Early Second Intermediate Period, up to the end of the Fourteenth Dynasty, and in a Late Second Intermediate Period, after the end of the Fourteenth Dynasty and until the fall of Avaris.

In this work the beginning of the Fifteenth Dynasty will not be considered a criterion for the beginning of the Late Second Intermediate Period, because the new seals and scarabs found would suggest an earlier beginning for this dynasty, so it is not a reliable feature that can be used for chronological purposes.

The main criterion used here to determine the Late Second Intermediate Period is the rise of the different dynasties in Upper Egypt, namely the Sixteenth and the Seventeenth Dynasty, as well as the Abydos Dynasty. The rise of these dynasties is considered of importance in this work because they meant new political powers that possibly caused changes in the material culture, also having an effect on its regionalization and, as a consequence, an impact also on the material culture of the New Kingdom. Given that the existence of the Abydos Dynasty is accepted in the present work, the kings of both

146 Moeller, Marouard, and Ayers 2011, 106-9; Ryholt 1997, 307-9.

147 Franke 2008, 279-80. The evidence is shown in detail in: Polz 2007, 62-95; Polz 2010; Polz 2018.

148 Ryholt 1997, 171-76.

149 Polz 2007, 61-95; Polz 2018, 230-31.

the Sixteenth and Seventeenth Dynasties are referred to as Theban rulers, even though the capital and exact area of power of the Sixteenth Dynasty is problematic, as explained above.

Lastly, the Late Middle Kingdom is also included in the analysis, not only because of the mentioned precursors to the Second Intermediate Period, but also to better understand the onset of the Second Intermediate Period and the changes involved in it.

(Opposite page) Summary of the main chronological frames hypothesized for the Second Intermediate Period: Frame 1 is the frame followed in the present work; Frame 2 is followed by Ryholt (1997); Frame 3 is followed by Allen (2010), Bietak (1984a, 1989b, 1991, and 2002), Franke (2008), and Marée (2010); Frame 4 is followed by Von Beckerath (1964); Frame 5 is followed by Ilin-Tomich (2014); Frame 6 is followed by Bennett (2002 and 2006), Miniaci (2010a and 2011), O'Connor (1997), Quirke (2004), and Schneider (2006).

[illegible]

REGIONALIZATION

The main feature that characterizes the Second Intermediate Period, distinguishing it from both the Middle Kingdom and the New Kingdom, is the political division. Next to this division, also in the material culture there are differences detectable, especially in the pottery and already since the Late Middle Kingdom.¹ From this, there are some questions that arise. Were connections between different areas in Egypt so problematic during the Second Intermediate Period, that these areas become secluded from each other? Did the political changes taking place in the Second Intermediate Period actively contribute to the regionalization of the material culture, and how? Which other reasons could cause the regionalization of material culture?

These questions constitute the main topic of this chapter, exploring which regions are so far thought to be detectable, what are the main reasons for this process, the way in which regionalization phenomena happening during the intermediate periods have been or can be analysed, and how the present work is going to contribute to the debates related to this topic. Firstly, this chapter will discuss the definition of region and regional identity, as well as the methods used in previous studies to examine the process of regionalization in both the First Intermediate Period and the Second Intermediate Period, and it will define what in the present work is considered to be a region. Successively, it will discuss the causes that initiated the process of regionalization in the Second Intermediate Period. Afterwards, it will describe the sites examined in the present work and the regions which, according to previous studies, can be detected during the Second Intermediate Period. Lastly, this chapter will illustrate the method used in the present work to study regionalization phenomena, and its contribution to the topic.

1 Bourriau 2010, 11-12; Bourriau et al. 2005, 123; Op de Beeck, Hendrickx, and Willems 2004, 254-55.

DEFINING A REGION

A region can be defined as a unit that can be distinguished from other units, both in time and space.² Inside these units, so inside their boundaries, the quantity of information and goods moving around is greater than across those boundaries, so to other units. Thus, the areas along the boundaries are peripheral, though they can serve as meeting points between the groups divided by the same boarder.³

In archaeological analysis, regions are areas where meaningful relationships can be detected between past human activities and the material culture produced by them, as well as the physical and social contexts in which these activities occurred.⁴ The boundaries of these past regions do not necessarily correspond to prominent geographic features, nor follow criteria similar to ours; they were also constantly changing.⁵

While a region can be characterized by physical proximity of its elements,⁶ it is actually important to select which other features are considered important to define both its identity and its relationships with similar units, namely with other regions.⁷ It is also important to select the scale for the analysis. To do so, it is useful to search for a scale where the considered area shows more interactions in its inside than with adjacent areas, and where boundaries detected through different criteria overlap.⁸

In disciplines such as human geography it is possible to observe and measure these interactions in a direct way, as for example by measuring the number of telephone calls or of bus passengers. However, in archaeology interactions are assumed to be witnessed by similarity in object types or groups, as long as artefacts' features are not used by a group to distinguish itself from other groups;⁹ therefore, interactions remain elusive in archaeology.¹⁰

Nevertheless, considering the type and quantity of persons, thus the segments of population based on status or on gender or on age or on ethnicity, that are expected to be involved in interaction can help explain both the type of interaction itself and its visibility in the archaeological record.¹¹ For exam-

2 Crumley and Marquardt 1990, 74.

3 Crumley and Marquardt 1990, 74-75.

4 Kantner 2008, 41.

5 Kantner 2008, 42.

6 Mansfield and Solingen 2010, 146.

7 Crumley and Marquardt 1990, 76.

8 Crumley and Marquardt 1990, 77.

9 Johnson 1977, 481.

10 Johnson 1977, 482.

11 Johnson 1977, 482-84.

ple, interactions have been analysed to study and explain, beyond ethnic differences, regions in pre-Roman Italy.¹²

Regional identity can be better understood if the focus is on the role that society-space and the individual/collective play in shaping each other.¹³ This also implies that regional identity is formed on one side from “above”, through territorial control or governance, on the other side from “below”, through territorial identification and resistance on part of the population.¹⁴

Connected to regional identity is regionalism, which can be defined as an interpretation of the process that leads to the institutionalization of a region.¹⁵ This process constructs, and is at the same time conditioned by, practices related to different factors.¹⁶ One of these factors is the spatialisation of the region, namely the recognition of a geographical territory with specific social and cultural practices.¹⁷ Another factor is the temporalisation of the region, namely the creation of stories concerning its past, present, and future.¹⁸ Other factors include a shared symbolic significance not only of the landscape and the history of the region, but also in the way of interactions with other groups.¹⁹ The last factors concern shared values and norms, which are safeguarded and enforced by communal institutions, which also guarantee security and order inside the region..²⁰

REGIONAL DIVERSIFICATION IN EGYPT

While Egypt can appear as a monolithic unity, especially in the periods of political unity, such as the Middle Kingdom, the reality is more nuanced. Small regional variations are visible in the archaeological record even in times when the central power is still strong.²¹ This has been detected in the present work as far as the Late Middle Kingdom is concerned, therefore also during the second half of the Twelfth Dynasty and will be elaborated on in the conclusions. Apart from the results deriving from the analysis of small finds, as in the present work, pottery is especially useful in detecting regional variation, because it

12 Roth 2012.

13 Paasi 2003, 476.

14 Paasi 2003, 476.

15 Paasi 2003, 478; Paasi 2012; Söderbaum 2011.

16 Paasi 2003, 478; Söderbaum 2011.

17 Paasi 2012.

18 Paasi 2012.

19 Paasi 2003, 478; Paasi 2012.

20 Paasi 2003, 478; Paasi 2012.

21 These are addressed especially in Schiestl and Seiler 2012, where pottery from different areas of Egypt during the Middle Kingdom is examined, revealing differences between them.

concerns objects that are used in everyday life (i.e. cooking, consuming food, drinking, storing cosmetics, and as burial goods).

From the analysis of the pottery, it is possible to reveal regional variation, and find precursors of types of pottery of the Second Intermediate Period, already in the late Twelfth Dynasty, after the reign of Senwosret III.²² Specific types of pottery are particularly diagnostic from this point of view, first of all the hemispherical round-bottomed bowls or cups,²³ and the beer jars.²⁴ These vessels were very common already in the early phase of the Middle Kingdom, and they continued to be common also during the Second Intermediate Period, but they became progressively more slender, and their profile became less rounded, with the widest diameter progressively switching to a lower point in the height of the vessels.²⁵

Similar developments are visible also in the dipper juglets,²⁶ which were used to collect and pour liquids from storage vessels and were at first imported from the Levant, becoming then locally produced. The dipper juglets became progressively slender and with a more pointed base during the Late Middle Kingdom and the early phase of the Second Intermediate Period, and successively returned to the earlier shape, less slender and with a more rounded base.²⁷ Also the juglets of Levantine Painted ware were at first imported and then became locally produced, especially in Lower Egypt.²⁸ The last type of pottery to be mentioned is the hole-mouth cooking pot,²⁹ which became progressively slender and with a curvier profile.

What makes these types of pottery useful for regional studies is not only the presence of imports, which characterizes specific areas like Lower Egypt, but also the fact that the described developments of their shape did not happen at the same time in all Egypt, but different places feature different stages.³⁰ Their development has also been used for chronological purposes, to

22 Schiestl and Seiler 2012 offer an overview of the pottery during the Middle Kingdom, highlighting the regional variations.

23 Aston et al. 2004, 62–63, 196–97; Bader 2007, 249–58; Bader 2009, 200–15; Czerny 2002, 133–34; Forstner-Müller 2007, 83; Kopetzky 2008, 211–17.

24 Bader 2007, 258–65; Bader 2009, 160–83, 215–24; Bietak 2002, 32–34.

25 Arnold, Arnold, and Dorman 1988, 135–39; Bader 2007, 249–65; Kopetzky 2008, 211–17.

26 D.A. Aston 2002, 49–50; Aston et al. 2004, 183, 238; Bietak 2002, 37; Forstner-Müller 2008, 79; Kopetzky 2002; Kopetzky 2008, 207–11.

27 Kopetzky 2002, 2008, 207–11.

28 Arnold, Arnold, and Allen 1995; D.A. Aston 2002; Bagh 2002; Bagh 2013; Bietak 1997; Bietak 2002; Cohen-Weinberger and Goren 2004; Czerny 2002.

29 Aston et al. 2004, 81, 244; Bader 2001; Forstner-Müller 2007, 89; Holladay Jr. 1982, 50.

30 Especially the hemispherical bowls: Aston et al. 2004, 62–63, 196–97; Bader 2007, 249–58; Bader 2009, 200–15; Czerny 2002, 133–34; Forstner-Müller 2007, 83; Kopetzky 2008, 211–17.

date the strata of sites like Tell el-Dab'a, Dahshur, and Memphis.³¹ For Tell el-Dab'a the relevant strata correspond to what the excavators have called phases H-G,³² while for Dahshur they correspond to what the excavators have called complexes 6-7,³³ and for Memphis correspond to what the excavators have called levels VIII-VII.³⁴

ANALYSIS OF REGIONS AND REGIONALIZATION IN EGYPTOLOGY

For the Second Intermediate Period, political institutions, in the form of the royal dynasties, have been one of the parameters used to detect regional identities. In other words, the attestations on monuments and on scarabs of royal names have been used to distinguish the areas over which each dynasty would have ruled.³⁵ Given our incomplete state of knowledge about the political developments of the Second Intermediate Period, identifying the political areas in which Egypt was divided is complicated (see Chapter 2). Therefore, in the present work the regions are not delineated based on political divisions.

Another parameter used to define regions has been the ritual and symbolic practices, in the form of burial customs. Seiler has analysed how the Theban area acquired its own identity in the Late Second Intermediate Period. She has shown that, while at first the funerary cults were mainly in the care of the family of the deceased, successively they became connected to the entire community, and their aim was to reintegrate the dead and his/her family into the community.³⁶ At the same time, while at first the funerary equipment was constituted by items used in everyday life, to materially make the deceased able to carry on a bodily existence in the afterlife, later these items included objects created especially for the tombs and intended to magically provide the deceased with what was needed in the afterlife.³⁷ As suggested also by the architecture and layout of the cemeteries, this change was likely due to the rise of a more conscious sense of community and togetherness, with also the need of defence against outsiders that might trespass into the community's territory.³⁸ It is possible that this evolution was due to the rise of the Seventeenth

31 Dorothea Arnold was the first one to trace the development of hemispherical bowls and use it for chronological purposes, based on the vessels found in Dahshur: Arnold, Arnold, and Dorman 1988, 135–39.

32 For the dating of these strata: Bietak 1984a, 474–82; Bietak 1985, 318–20; Bietak 1989b, 93–96; Bietak 1991; Bietak 2002, 32–37; Weinstein 1995, 87.

33 Do. Arnold 1982; Bader 2002; Bietak 1984a, 272–74; Bietak 2002, 32–34.

34 Bader 2007, 253–55; Bader 2009, 187–99.

35 See for the example: Ryholt 1997.

36 Seiler 2005, 191–92 and 198–98; Seiler 2010, 51–52.

37 Seiler 2005, 190–92 and 198–99; Seiler 2010, 40 and 49.

38 Seiler 2010, 51–52.

Dynasty, in the Late Second Intermediate Period, and by its need to create a unifying identity for the Theban area, over which it had power.³⁹

A similar method to the one just discussed has been used by Miniaci,⁴⁰ who has examined the religious beliefs as shown by the iconography and shape of the Rishi coffins, and by the burial equipment found with them. He has demonstrated that already in the Late Middle Kingdom there was a mixing of two main religious beliefs concerning the afterlife. One of them was the concept of Osirification, namely identifying the deceased as the god Osiris, which was a concept common in Lower Egypt. The other concept conceived the afterlife as new life on the solar boat with the god Ra, and as part of the solar cycle, and was more common in Upper Egypt. While this mixture of religious beliefs is visible in the material culture of both the Late Middle Kingdom and the Early Second Intermediate Period, in the Late Second Intermediate Period the second one became the main religious belief concerning the afterlife. As suggested also in Seiler's studies, this change was probably caused by the wish of the kings ruling over the Theban area to affirm a new unifying identity. Keeping the changing burial customs in mind can be useful also for the present work, to get a more complete picture of the period.

Further studies on regionalism have been conducted by Seidlmayer,⁴¹ who has used practices visible in material culture, as well as archaeological seriation, to detect regions and order the examined tombs in a chronological sequence. The starting assumption is that the popularity of object types grows steadily until it reaches its peak at a certain point in time. From this, with the help of digital tools and based on the popularity of types chosen as significant, the archaeological contexts are grouped in succeeding phases. Seidlmayer has applied this method to the cemeteries dated to the First Intermediate Period, to examine the development of regionalism during this period, using mostly pottery. The sites analysed include Edfu,⁴² Tarif,⁴³ the southern Theban cemeteries,⁴⁴ Denderah,⁴⁵ Qau el-Kebir, Matmar, and Mostagedda,⁴⁶ Rifeh,⁴⁷ Beni

39 Seiler 2005, 197-200.

40 Miniaci 2007a; Miniaci 2007b; Miniaci 2011.

41 Seidlmayer 1990.

42 Seidlmayer 1990, 40-68.

43 Seidlmayer 1990, 69-99.

44 Including Deir el-Bahri, Asasif, Qurneh, Birabi, Scheick Abd el-Qurna: Seidlmayer 1990, 100-4.

45 Seidlmayer 1990, 105-23.

46 For these three sites: Seidlmayer 1990, 123-210.

47 Seidlmayer 1990, 210-16.

Hassan,⁴⁸ Harageh,⁴⁹ Sedment,⁵⁰ Gurob,⁵¹ Furthermore, for sites like Qau el-Kebir, Mostagedda, and Matmar, also scarabs, stone vessels, and faience vessels have been examined. Moreover, when royal names could be linked to a specific phase, absolute dates have been provided as well. On the one hand, this has supplied a possible dating for contexts that had not been dated before, while on the other hand a comparison of the sites has shown the regional developments of the material culture of the First Intermediate Period. Despite having different questions and a different methodology, this study is useful to the present work because it examines the regionalization process based on quantitative analysis of the material culture, in the same way as the present work does.

Another approach to studying regionalism, again used for the First Intermediate Period, can be found in Morenz.⁵² He has focused on Gebelein and has analysed historical documents, especially the ones related to the local history and persons, and the products of the upper classes. Morenz has tried to reconstruct the regional system, with its communal symbols, narratives, socio-economic and cultural practices. He has adopted Geertz's concept of "thick description",⁵³ according to which human behaviours are not only mechanically described by the scholar, but also put into context and interpreted, so that they become meaningful also to an outside viewer. The ultimate aim of the "thick description" is to interpret the guiding symbols, which, in Geertz's opinion, are the main elements that constitute a culture and allow it to develop and perpetuate.⁵⁴ Despite the scarcity of written documents for the Second Intermediate Period, which differentiates it from the First Intermediate Period (see Chapter 2), the approach here described is surely insightful.

WHAT IS A REGION? A MATTER OF STYLE

In the present work, the sites are first grouped according to geographical parameters, forming what in the present work are referred to as areas. Thus, an area is a group of sites close to each other by a geographical point of view. From this, a region is considered an area whose sites share similar developments in the material culture during the period under consideration, namely the Second Intermediate Period. More in detail, sites are considered part of the same region according to two conditions. The first condition is that the

48 Seidlmayer 1990, 216–33.

49 Seidlmayer 1990, 234–46.

50 Seidlmayer 1990, 247–341.

51 Seidlmayer 1990, 341–47.

52 Morenz 2010.

53 Geertz 1973.

54 Geertz 1973.

strata dated to the Second Intermediate Period contain objects with a similar style, distinguishable from the styles of the Middle Kingdom and of the New Kingdom. The other condition is that the style of the New Kingdom appears in archaeological strata whose dating is contemporary.

Style can be seen as a part of those behaviours and practices that participate in, and enhance, the process of exchanges of information, energy, and matter of the group producing them.⁵⁵ Style is important as a means of sending messages between socially distant individuals,⁵⁶ so that is not found in all objects, but only in those that display visibility.⁵⁷ However, especially in archaeology, detecting which objects or aspect of style are used to convey these messages can be difficult.⁵⁸ Because of this difficulty, style has also been defined as those features that are not consciously selected and are, thus, random, while only the functions of the objects determine if they fit the needs of a group and are, therefore, kept and developed.⁵⁹

Despite this utilitarian definition, style can be considered also as the symbolic aspect of the variability in material culture. Nevertheless, it is important to put objects and their style in perspective, examining how they could function as symbols and understanding them in relations to other aspects of material culture in a particular society.⁶⁰ Therefore, style can be better defined as the manner an activity is realized, thus as an omnipresent aspect of an activity, especially of a repeated one.⁶¹ style is the way something is done.⁶² This means also that style is the manner materials are interpreted and transformed into social form and identity, and are part of the way a group constructs its reality⁶³ and roles in the group are performed.⁶⁴ Hence, style derives from a choice, made to produce a certain effect.⁶⁵

The fact that objects of specific forms and designs are associated with a particular group in a particular space and time, despite the fact that the same group would have a greatly wider range to choose from, derives from the fact that those forms and designs fit the unique historical conditions of that particular group in that space and time.⁶⁶ This implies that groups close in time

55 Wobst 1977, 319–24.

56 Wobst 1977, 324–34.

57 Wobst 1977, 334–37.

58 Hodder 1982, 204–5; McGuire 1981, 19–22.

59 Dunnell 1978, 199–200.

60 McGuire 1981, 22–26.

61 Renfrew and Bahn 2016, 423.

62 Hodder 1982, 204–7; Renfrew and Bahn 2016, 423; Shanks 2004, 18.

63 Hodder 1982, 204–7; Shanks 2004, 14–19.

64 Sackett 1977, 370–71.

65 Deetz 1965, 2.

66 Sackett 1977, 370–74; Wobst 1977, 321.

and space and sharing social relations will share similarities in style.⁶⁷ Consequently, style can be used, as in the present work, to indicate the shapes, surface decorations and treatments, and techniques that characterize objects in a specific space and period.⁶⁸ The Middle Kingdom⁶⁹ and the New Kingdom⁷⁰ have each distinguishable styles and, while the former was fabricated in workshops in the Memphis area, the latter was first and mainly produced in Upper Egypt, especially in the Theban area.⁷¹

Often, as it can be seen at sites such as Tell el-Dab'a and Memphis, this style looks more like a transition between the styles of the Middle Kingdom and the New Kingdom. In other words, while it mainly uses features typical of the Middle Kingdom, it also mixes it with new ones.⁷² Furthermore, especially in the Eastern Delta, the style common in the material culture of Syria and Palestine in the Middle Bronze Age, referred to as Levantine style, is also found. This style was characterized by features that make it distinguishable from the Egyptian material culture, though often it was finally imitated in Egypt using local fabrics, like it happened for the dipper juglets⁷³ and the juglets of Levantine Painted ware.⁷⁴ Lastly, mostly in Upper Egypt, in tombs of the so-called Pan-grave group a style common in Nubian material culture is found.

THE CAUSES OF REGIONALIZATION

This regionalization process is believed to have been, at least partially, generated by the fact that access to primary sources was made more difficult by the political division. Because of this division, each area had to rely on its local workshops, while during the Middle Kingdom the production of material goods was regulated by the central government and was localized in specific places, from where it was distributed to the other areas in Egypt.⁷⁵ However, how far does the division go and was the production really so differentiated and localized?

67 Sackett 1977, 371.

68 Renfrew and Bahn 2016, 133.

69 For the style of the Middle Kingdom: Wodzińska 2009.

70 For the style of the New Kingdom: Wodzińska 2010.

71 For an overview of pottery styles in the Middle Kingdom and New Kingdom: Arnold and Bourriau 1993; Bourriau 1981b; Eggebrecht 1975; Wodzińska 2009, 2010.

72 As discussed in: Bader 2009, 38–42; Bietak, Forstner-Müller, and Mlinar 2001; Bourriau 1997, 165; Bourriau 2010, 13; Forstner-Müller 2003.

73 Dipper juglets are discussed in: Kopetzky 2002.

74 The Levantine Painted Ware is discussed in: Arnold, Arnold, and Allen 1995; D.A. Aston 2002; Bagh 2002; Bagh 2013; Bietak 1997; Bietak 2002; Cohen-Weinberger and Goren 2004; Czerny 2002.

75 Bietak 2010, 151–52; Bourriau 1997, 159.

There is also the possibility that the presence of groups of foreign origins contributed to the development of different regional styles,⁷⁶ as it appears to be the case for example in the Eastern Delta. Nonetheless, it has been mentioned how examining ethnic identity is problematic, and how in the present work the features that are thought to be of foreign origins are analysed not as ethnic markers, but as elements of the regional styles in Egypt. This means that imported objects, or the objects inspired by them or even imitating them and produced in Egypt, will not be treated separately from the other objects produced in Egypt.

Lastly, according to studies such as the ones by Seiler and Miniaci, the development of regional styles could be due to the political changes, namely the rise of new dynasties, happening in the Second Intermediate Period.⁷⁷ In other words, the new dynasty could wish to introduce new styles or new customs, or re-appropriate old ones, to create an identity of their own, distinguished from the ones of the other regions and the other dynasties. This would have the aim to create a sense of community and unity in the area, ultimately to enhance protection against threats from other areas. This could be, for example, one of the causes of the changes visible in the Theban region in contexts dated to the late Second Intermediate Period.⁷⁸ Though the political situation and the history of the Second Intermediate Period are not completely clear yet, it is not possible to separate these from the regionalization of the material culture. Therefore, while the focus of this work is on the material culture, historical implications will be made to explain its development, when enough evidence is available to back it up.

POSSIBLE REGIONS IN EGYPT DURING THE SECOND INTERMEDIATE PERIOD

The first region is the Delta. Tell el-Dab'a, identified with Avaris, the capital of the Fifteenth Dynasty⁷⁹ and probably also of the Fourteenth Dynasty,⁸⁰ is the largest and the most extensively excavated and studied site of the Second Intermediate Period. However, the site was already inhabited during the Middle Kingdom, as can be seen in the strata corresponding to what the excavators have called phases H and G.⁸¹ At Tell el-Dab'a one can notice an increase

76 Bader 2012a, 217–22; Bader 2017, 27–28; Bourriau 1981b, 55; Holladay Jr. 1997, 201–4.

77 Miniaci 2007a; Miniaci 2007b; Miniaci 2011; Seiler 2005; Seiler 2010.

78 Seiler 2005, 185–200; Seiler 2010, 51–52.

79 See the description of the site in: Bietak 1975; Bietak 1981; Bietak 1996.

80 According to Ryholt: Ryholt 1997.

81 Bietak 1984a, 474–82; Bietak 1985, 318–21 and 324–40; Bietak 1989b, 93–96; Bietak 1991, 31–38; Bietak 2002, 32–37.

in objects of Levantine style, first imported from the Levant and later locally imitated, in the strata corresponding to the second half of the Thirteenth Dynasty,⁸² namely phases F and E/3.⁸³ Despite this trend, the overall material culture of the time still followed the style of the Middle Kingdom,⁸⁴ while the Levantine elements were still at a minority, and are found especially in the funerary equipment.⁸⁵ In the strata corresponding to the Fifteenth Dynasty, namely phases E/2, E/1, D/3 and D/2,⁸⁶ these Levantine imports decrease and their imitations in local materials increase,⁸⁷ while a different style can be detected, which mixed Egyptian and Levantine features and became typical of Tell el-Dab'a during the Second Intermediate Period.⁸⁸ Nevertheless, this change is not dramatic and the differences between the style of the Middle Kingdom and the one of the Second Intermediate Period are actually subtle.⁸⁹ Lastly, the style typical of the New Kingdom arrived in Tell el-Dab'a at the very end of the Second Intermediate Period.⁹⁰

A similar process can be detected in the material culture in Tell el-Maskhuta, also located in the Eastern Delta, in the Wadi Tumilat. The site was occupied during the First Intermediate Period and the Late Middle Kingdom, and in the New Kingdom and Late Period as well,⁹¹ but became more important in the Second Intermediate Period as point of communication between the Levant and Egypt.⁹² More in detail, the phases belonging to the Second Intermediate Period are dated to the later part⁹³ and show that, like in Tell el-Dab'a, Levantine objects were first imported and then imitated in local materials,⁹⁴ while at the same time the main style of material culture became a mixture of Egyptian and Levantine styles,⁹⁵ in the same way described for Tell el-Dab'a.

82 D.A. Aston 2002; Aston et al. 2004, 324-351; Bietak 1985, 333-40; Bietak 1996, 29-31; Bietak 1997, 30; Forstner-Müller 2008.

83 Bietak 1984a, 474-82; Bietak 1985, 318-20, 340-43; Bietak 1989b, 93-96; Bietak 1991, 38-41; Bietak 2002, 37-38.

84 As shown in: Aston et al. 2004, 324-51; Bietak 1997, 45; Bietak 2010; Forstner-Müller 2007, 86-93; Schiestl 2008b; Schiestl 2009.

85 Described in: Schiestl 2008b; Schiestl 2009; Schiestl 2012a.

86 Bietak 1984a, 474-82; Bietak 1985; Bietak 1991; Bietak 2002; Weinstein 1995.

87 Aston et al. 2004; Bietak 2010; Forstner-Müller 2008.

88 Aston et al. 2004; Bader 2013; Bader 2017, 27-28; Bietak 2002; Forstner-Müller 2003; Forstner-Müller 2010.

89 Bietak, Forstner-Müller, and Mlinar 2001; Forstner-Müller 2003.

90 D.A. Aston 1998; Bietak 2010; Bietak, Forstner-Müller, and Mlinar 2001; Fuscaldo 2000.

91 Holladay Jr. 1982; Holladay Jr. 1997.

92 Holladay Jr. 1982; Holladay Jr. 1997; MacDonald 1980; Redmount 1993; Redmount 1995a; Redmount 1995b.

93 Holladay Jr. 1997; Redmount 1993.

94 Holladay Jr. 1982; Holladay Jr. 1997; Redmount 1993; Redmount 1995a.

95 Holladay Jr. 1997; Redmount 1993; Redmount 1995a.

Still in the Wadi Tumilat, Tell el-Retaba was inhabited between the Middle Kingdom and the New Kingdom, as well as during the Late Period.⁹⁶ In particular, tombs and parts of a settlement dated to the Late Second Intermediate Period have been unearthed there. The material culture found in these contexts shows similarities with the other sites of the Eastern Delta described above, with mixtures of Egyptian and Levantine style.⁹⁷

A similar mixing of Levantine and Egyptian styles is displayed also in the material culture of the Second Intermediate Period in Tell el-Yahudiyah.⁹⁸ This site is located on the Pelusiac branch of the Nile, like Tell el-Dab'a, and was occupied also during the New Kingdom and the Late Period.⁹⁹ This site is mostly known because it has given the name to a pottery ware typical of the Eastern Mediterranean in the Late Middle Kingdom and Second Intermediate Period.¹⁰⁰

Still on the Pelusiac branch of the Nile, in Tell Farasha tombs dated to the Second Intermediate Period were found. All in all, the material culture at this site is like the one found at Tell el-Dab'a.¹⁰¹

Lastly, in the Eastern Delta the site of Kom el-Khilgan was occupied in Prehistory and the Early Dynastic times. Other remains include an occupation layer and graves dated to the Second Intermediate Period, as well as a few graves dated to the Roman Period.¹⁰²

To conclude, the sites in the Eastern Delta have the longest and clearest phases datable to the Second Intermediate Period in their material culture, with a very gradual change from the Middle Kingdom style to the New Kingdom styles, which seem to appear at the end of the Second Intermediate Period. The material culture of the Second Intermediate Period of these sites also displays common features, namely a similar mixing of Egyptian and Levantine styles. Because of this, in the present work the Eastern Delta is considered a region on its own.

96 Excavation report: Rzepka et al. 2014.

97 Excavation report: Rzepka et al. 2014.

98 For more information: Adam 1958; Ashmawy Ali 2010; Petrie, Griffith, and Newberry 1890; Petrie and Duncan 1906.

99 For more information: Adam 1955; Ashmawy Ali 2010; Buisson 1929; Petrie and Duncan 1906; Tufnell 1978.

100 For the main publications on this type of pottery: D.A. Aston 2008; Aston and Bietak 2012; Bietak 1989a; Kaplan 1980; Merrillees 1974a.

101 For more information: Yacoub 1983.

102 Buchez and Midant-Reynes 2007; Buchez and Midant-Reynes 2011; Pantalacci 2005; Pantalacci and Denoix 2006; Tristant, De Dapper, and Midant-Reynes 2007; Tristant, De Dapper, and Midant-Reynes 2008.

The Memphis-Fayyum region

At the site of Kom Rabi'a, part of ancient Memphis, located in Lower Egypt at the entrance of the Nile Delta, there seems to be a noticeable change in material culture between the Middle Kingdom and the New Kingdom.¹⁰³ In detail, one can notice a break between the strata that can be dated to the Middle Kingdom, strata that correspond to what the excavators have called levels VIII-VII,¹⁰⁴ and the strata that can be dated to the beginning of the New Kingdom, strata that correspond to what the excavators have called level V.¹⁰⁵ It can be noticed that the style found in the strata of levels VIII-VII is the typical one of the Middle Kingdom, even if local variations are visible,¹⁰⁶ while in the strata of level V the style typical of the New Kingdom is found.¹⁰⁷ Nevertheless, there seem to be intermediary strata, corresponding to what the excavators have called level VI,¹⁰⁸ with a short transitional phase, where both styles are found and which probably corresponds to the Late Second Intermediate Period.¹⁰⁹ In the strata of level VI, the material culture found in Kom Rabi'a seems to follow a different development from the one of Tell el-Dab'a.¹¹⁰ This divergence seems to indicate that Memphis did not belong to the same region to which the Eastern Delta belonged, but that the site was part of a different region during the Second Intermediate Period.¹¹¹

Another important site in the Memphis-Fayyum area is Lisht, which is located on the west side of the Nile, to the south of Memphis and to north of the Fayyum. This site was especially important during the Middle Kingdom because it was in the area of the capital town of the time. While the capital town has not been identified, the cemetery has been found at the modern site of Lisht, where were built the royal pyramids and tombs of the time.¹¹² However, against what was previously thought, the site was probably still occupied after the Thirteenth Dynasty had lost power over the whole country, so during

103 Bader 2009, 38–42; Bourriau 1997, 163–65; Bourriau 2010, 13.

104 Bader 2007, 253–54; Bader 2009, 52–3. A detailed description of the strata can be found in: Giddy 2012; Giddy, Bourriau and Gallorini 2016, 39–71 and 101–16.

105 Bader 2007, 253–54; Bader 2009, 55–56.

106 Bourriau and Gallorini 2012, 107–30; Giddy, Bourriau and Gallorini 2016, 207–11.

107 Bader 2009, 50–57; Bourriau 1997, 161–65.

108 Bader 2007, 253–54; Bader 2009, 53–55. Detailed description of stratum VI can be found in: Giddy 2012; Giddy, Bourriau and Gallorini 2016, 77–100 and 117–96.

109 Bader 2009, 53–55; Bourriau 1997, 161–65; Bourriau 2010; Giddy, Bourriau and Gallorini 2016, 207–11.

110 Bader 2007, 258–65; Bader 2008, 213–16; Bader 2009, 159.

111 Bader 2007, 258–65; Bader 2008, 216–17.

112 For more information: S.J. Allen 1998; Arnold, Arnold, and Dorman 1988; Di. Arnold et al. 1992; Lansing 1920; Lansing 1924; Lansing 1926; Lansing 1933a; Lansing 1933b; Lansing and Hayes 1934.

the early part of the Second Intermediate Period.¹¹³ In particular, tombs of the Late Middle Kingdom and of the Second Intermediate Period are found in the cemetery of Lisht North,¹¹⁴ where it can be noticed that the material culture still followed the style of the Middle Kingdom.¹¹⁵ Despite this, also in Lisht there seems to be a conspicuous change from the style of the Middle Kingdom to the one of the New Kingdom, as in Memphis but in archaeological contexts of a slightly later dating.¹¹⁶

At the entrance of the Fayyum, the cemeteries of Harageh are dated from the Early Dynastic Period to the Coptic Period, including the Late Middle Kingdom.¹¹⁷ A few of the tombs can possibly be dated to the Early Second Intermediate Period, though they do not show conspicuous differences with the ones of the Late Middle Kingdom.¹¹⁸ Still at the entrance of the Fayyum, south of Harageh, Sedment has cemeteries dated also to the Old Kingdom, to the First Intermediate Period,¹¹⁹ and the early part of the Middle Kingdom¹²⁰ to the Second Intermediate Period. In particular, the cemetery K in the Mayana district of Sedment¹²¹ is dated to the Late Second Intermediate Period,¹²² on the basis of parallels with material from Gurob.¹²³ It can be noticed that the material culture from this cemetery shows a detectable switch from the style of the Middle Kingdom to the one of the New Kingdom.¹²⁴

Tarkhan is another burial site in the same area, dated mostly to the Early Dynastic Period. It is included in this study because one tomb found there has been dated by Petrie to the Second Intermediate Period.¹²⁵ While the sample from Tarkhan is not representative for the analysis conducted in the present work, it is taken into consideration to gain a more complete picture. Abusir el-Meleq is known mostly for the tombs and pyramids of the Old Kingdom,

113 Bourriau 2010, 16-17.

114 For more information: Arnold, Arnold, and Allen 1995; Arnold, Arnold, and Dorman 1988; Di. Arnold et al. 1992; Bourriau 1996; Lansing 1926; Lansing 1933a; Lansing 1933b; Lansing and Hayes 1934; Martin 2004; Merrillees 1978b.

115 Bourriau 1997, 165-66; Bourriau 2010, 13-17; Williams 1975, 132-38.

116 Bourriau 1997, 168; Bourriau 2010, 35.

117 For more information: Bourriau 1991a; Engelbach and Gunn 1923; Grajetzki 2004; Kemp, Merrillees, and Edel 1980; Williams 1975, 120-27.

118 Williams 1975, 120-27.

119 For more information: Petrie and Brunton 1924; Seidlmayer 1990.

120 As shown by the pottery discussed in: Bader 2012b.

121 For more information: Petrie and Brunton 1924.

122 Bourriau 1997, 167; Bourriau 2010, 20-22; Williams 1975, 217-18.

123 Bourriau 2010, 20; Williams 1975, 217-19.

124 Bourriau 1997, 167; Bourriau 2010, 17-20.

125 For more information: Bourriau 1981b, 127; Petrie 1914, 12.

though material of the Second Intermediate Period has been retrieved from tombs.¹²⁶

The last settlement mentioned for the area is Qasr el-Sagha, located in the Fayyum. There, parts of a settlement have been uncovered. This settlement was inhabited by the workers connected to the functioning of the nearby temple and cemetery during the Middle Kingdom.¹²⁷ Furthermore, pottery dated to the Second Intermediate Period, including Pan-Grave pottery and Levantine imports, has been discovered near the temple.¹²⁸

To conclude, it can be noted that the sites described in this section follow the same pattern, namely keeping the Middle Kingdom style until the Late Second Intermediate Period. Because of this trend, they could be considered to form an independent region in the Memphis-Fayyum area.¹²⁹

Sites of the Late Middle Kingdom from the Memphis-Fayyum area

Aside from sites containing strata dated to the Middle Kingdom and to the Second Intermediate Period, there are several sites in the Memphis-Fayyum area that were occupied only during the Middle Kingdom and not during the Second Intermediate Period. These sites are described in this chapter because they have material dated to the Late Middle Kingdom, which is included in the analysis conducted in the present work.

The first site of this group is Dahshur, which is located just south of Memphis, on the West bank of the Nile. The site is mostly known for its pyramids and tombs, dated to both the Old Kingdom and the Late Middle Kingdom.¹³⁰ In particular, the strata dated to the Late Middle Kingdom correspond to what the excavators have called complexes 6-7.¹³¹

More to the south, at the entrance of the Fayyum, at the site of Lahun tombs of the late Middle Kingdom have been excavated, mostly belonging to members of the royal family and the royal court.¹³² Furthermore, cemeteries

126 For more information: Möller and Scharff 1926.

127 For more information: Šliwa 1983; Šliwa 1986; Šliwa 1988; Šliwa 1992a; Šliwa 1992b.

128 For more information: Arnold, Arnold, and Brodbeck 1979; Šliwa 1983; Šliwa 1986; Šliwa 1988; Šliwa 1992a; Šliwa 1992b.

129 Bourriau 1997, 168; Bourriau 2010, 35.

130 For more information: S.J. Allen 1998; S.J. Allen 2000; S.J. Allen 2011; S.J. Allen 2014; Di. Arnold 1980; Di. Arnold 1981; Di. Arnold 1982; Di. Arnold 1996; Arnold and Stadelmann 1975; Arnold and Stadelmann 1977; Do. Arnold 1976; Do. Arnold 1977; Do. Arnold 1982; Bourriau 1997; De Morgan, Legrain, and Jéquier 1903; De Morgan et al. 1895; Oppenheim 1996; Schiestl 2008a; Schiestl 2012b; Stadelmann and Alexanian 1998.

131 Do. Arnold 1982; Bader 2002, 36-38; Bietak 1984a, 472-74; Bietak 2002, 32-34.

132 For more information: Brunton 1920; Kemp, Merrillees, and Edel 1980; Petrie, Brunton, and Murray 1923; Petrie et al. 1891; Quirke 1998; Quirke 2005; Winlock 1934.

of the Early Dynastic and of the Third Intermediate Period have also been discovered there.¹³³ Lastly, the site is connected to a well-preserved settlement of the Late Middle Kingdom, which gives a good glimpse in the daily life of an Egyptian town of that time and is known as Kahun, after the name Petrie used when he published his excavations there.¹³⁴

Still in the area of the Fayyum, tombs dating from the Middle Kingdom to the Roman Period have been discovered at Hawara.¹³⁵ Of these tombs, of interest to the present work are the ones dated the Late Middle Kingdom, which include royal tombs.¹³⁶ Lastly, in the Fayyum area, tombs dated to the Late Middle Kingdom have been unearthed at the site of Riqqeh.¹³⁷

Middle and southern Upper Egypt

Dishasha is a site in Middle Egypt, where tombs mostly of the Old Kingdom, and of the Second Intermediate Period, as well as material of very early New Kingdom have been excavated.¹³⁸ At Rifeh, known also as Deir Rifeh, in Middle Egypt on the West bank of the Nile, cemeteries dating from the First Intermediate Period to the Roman period have been found.¹³⁹ Tombs dated to the Middle Kingdom have been also uncovered there,¹⁴⁰ as well as tombs of the Second Intermediate Period and of the Pan-grave culture, in particular in cemetery S.¹⁴¹ The tombs of this cemetery show a noticeable change from the style of the Middle Kingdom to the one of the Second Intermediate Period, but in archaeological contexts of an earlier dating than the sites of the Memphis-Fayyum area and in the last part of the Thirteenth Dynasty.¹⁴² Giving a more precise dating to each tomb is difficult,¹⁴³ though a tentative dating towards the Late Second Intermediate Period has been provided for a few of

133 For more information: Petrie, Brunton, and Murray 1923.

134 For more information: Bourriau 1981b; Burton-Brown 1959; Gallorini 1998; Gallorini 2009; Gallorini 2011; Kemp 1977; Merrillees 1973; Petrie, Griffith, and Newberry 1890, 21–31; Petrie et al. 1891; Quirke 2005; Tufnell 1975.

135 For more information: Petrie, Griffith, and Newberry 1890; Petrie, Wainwright, and Mackay 1912.

136 For more information: Bourriau 1981b; Farağ and Iskandar 1971; Petrie, Griffith, and Newberry 1890, 12–21; Petrie, Wainwright, and Mackay 1912.

137 For more information: Bourriau 1981b; Eggebrecht 1975; Engelbach et al. 1915; Williams 1975, 115–20.

138 For more information: Bednarski 2007; Petrie and Griffith 1898.

139 See the excavation reports: Petrie, Thompson, and Crum 1907.

140 Petrie, Thompson, and Crum 1907, 11–20.

141 Petrie, Thompson, and Crum 1907, 20–21.

142 Bourriau 1997, 167; Bourriau 2010, 22–23; De Souza 2019, 56–57.

143 Bourriau 1997, 167–68; De Souza 2019, 56–57.

these tombs, based on parallels with the material culture and the burial customs of other sites.¹⁴⁴

At the site of Matmar, remains dated from Prehistory to the Coptic period have been excavated. These remains include mostly cemeteries, but also a temple.¹⁴⁵ The tombs of the Second Intermediate Period are found in cemetery 5000¹⁴⁶ and have been dated to the Late Second Intermediate Period:¹⁴⁷ their material culture is similar to the one of sites such as Mostagedda and Qau el-Kebir, described in the following paragraphs.

The cemeteries at Mostagedda, south of Matmar and on the West bank of the Nile, are dated to several periods of ancient Egyptian history.¹⁴⁸ More in particular, the tombs of the Second Intermediate Period are found mostly in cemetery 3000, but also in cemeteries 1000 and 5000.¹⁴⁹ The development of the material culture found in these tombs is similar to the one displayed in cemetery S of Rifeh.¹⁵⁰ Furthermore, these tombs show Nubian connections and include Pan-grave tombs.¹⁵¹ Though in this cemetery a precise dating has not been determined for many of the tombs, for a few of them a tentative dating has been given through parallels in the material culture and burial customs, and places them in the Late Second Intermediate Period.¹⁵² The Late Second Intermediate Period is also the dating of the archaeological contexts where the style of the New Kingdom appears, though these contexts precede the ones in the Memphis-Fayyum area, in the same way that it can be noticed in Rifeh.¹⁵³

At Qau el-Kebir, south of Mostagedda and on the East bank of the Nile, have been unearthed cemeteries and villages dated from the Early Dynastic to the Coptic period.¹⁵⁴ Concerning the cemeteries dated to the Second Intermediate Period,¹⁵⁵ they are dated to both the Early and the Late Second Intermediate Period¹⁵⁶ and, though a precise dating for part of these tombs has not been reached yet, a tentative dating has been proposed for a few of them, on the basis of the burial customs and of parallels with the material culture of other

144 De Souza 2019, 57; Williams 1975, 199–203.

145 For more information: Brunton 1948.

146 Brunton 1948, 56–58.

147 Brunton 1948, 56–58; Williams 1975, 191, 211.

148 For more information: Brunton and Morant 1937.

149 See the excavation reports in: Brunton and Morant 1937.

150 As discussed in: Bourriau 1981a; Bourriau 1997, 167; Bourriau 2010, 22–23.

151 For these Pan-grave tombs: Brunton and Morant 1937.

152 De Souza 2019, 57–58; Williams 1975, 194–99.

153 Bourriau 1997, 167–68; Bourriau 2010, 22–23 and 35.

154 For more information: Brunton, Gardiner, and Petrie 1927; Brunton, Gardiner, and Petrie 1928; Brunton, Gardiner, and Petrie 1930.

155 See the excavation reports in: Brunton, Gardiner, and Petrie 1930.

156 Bourriau 1997, 167; Bourriau 2010, 25–28.

sites.¹⁵⁷ As in Mostagedda, the cemeteries of the Second Intermediate Period have also links with Nubia and include the so-called Pan-grave tombs,¹⁵⁸ which have been divided into three phases on the basis of the Egyptianization of the funerary equipment (see Chapter 4). Of these phases, it is between the first and the second one that a change from the style of the Middle Kingdom to the one of the New Kingdom is visible.¹⁵⁹ All in all, the style of the New Kingdom seems to appear in Qau el-Kebir when it appears also in Mostagedda.¹⁶⁰

Going to southern Upper Egypt, on the East bank of the Nile, at Balabish tombs dated to the Late Second Intermediate Period have been discovered,¹⁶¹ which belong to the Pan-grave culture.¹⁶² Moreover, tombs of the New Kingdom are present there.¹⁶³

Moving further south, on the East bank of the Nile, Abydos is one of the most important sites throughout the history of ancient Egypt. As far as the Second Intermediate Period is concerned, Abydos has a story comparable to the one of the other sites in Middle Egypt.¹⁶⁴ Tombs of the Second Intermediate Period, including Pan-grave tombs, are present at this site,¹⁶⁵ in cemeteries C and W,¹⁶⁶ D,¹⁶⁷ and E.¹⁶⁸ Nevertheless, also in this case a precise dating is missing for many of the tombs, while for a few of them a tentative dating has been given on the basis of parallels in the material culture and burial customs.¹⁶⁹

In Hu, south of Abydos and on the West bank of the Nile, remains dated from Prehistory to the Roman Period have been uncovered.¹⁷⁰ In particular, the tombs dated to the Second Intermediate Period span its entire length and are found in cemeteries X and Y/YS, which also contain Pan-grave tombs.¹⁷¹ Here, a development similar to the one detected in the cemeteries of Qau

157 De Souza 2019, 59-61; Williams 1975, 188-91, 205-10.

158 For these Pan-grave tombs: Brunton, Gardiner, and Petrie 1930; Bourriau 1981a.

159 Bourriau 1991a, 5; Bourriau 2001, 11-14; Bourriau 2010, 25-29.

160 Bourriau 1997, 167; Bourriau 2010, 22-25.

161 For the dating: De Souza 2019, 61-62; Williams 1975, 204.

162 For more information: Wainwright 1915; Wainwright and Whittemore 1920, 8-52.

163 For more information: Wainwright and Whittemore 1920.

164 Bourriau 2010, 29-32.

165 Bourriau 1981a, 32-33.

166 For both groups: Peet 1914, 54-63.

167 Ayrton et al. 1904, 47-54; Randall-MacIver, Mace, and Griffith 1902, 67-69, 97-101.

168 See the excavation report: Garstang, Newberry, and Milte 1901.

169 For the tentative dating of some of these tombs: Bourriau 1981a; Bourriau 2010; Williams 1975, 166-72, 211-12.

170 For more information: Petrie and Mace 1901.

171 Described in: Bourriau 2009; Bourriau 2010, 29-32; De Souza 2019, 62-64; Petrie and Mace 1901, 45-53; Williams 1975, 212-16.

el-Kebir and of Mostagedda is visible.¹⁷² As at these sites, the tombs have not been precisely dated,¹⁷³ although cemetery Y could be dated to the Late Second Intermediate Period.¹⁷⁴ Further south, at Ballas, on the West bank of the Nile, a cemetery of the Early Dynastic Period was excavated, as well as tombs of the Middle Kingdom. Near this site, at Deir el-Ballas, parts of a settlement dated to the Late Second Intermediate Period has been discovered,¹⁷⁵ which included Nubian pottery.¹⁷⁶ Lastly, at Nubt a town and tombs of the Late Middle Kingdom have been excavated,¹⁷⁷ though the site to which it is connected, Naqada, is mostly known for the prehistorical cemeteries and for the temple dedicated to Seth in the New Kingdom. Naqada was occupied also during the New Kingdom.¹⁷⁸

To conclude, though it cannot be said if these sites in Middle Egypt and in the area of Abydos where united in an independent region, it is meaningful that they seem to follow a similar path in their material culture between the Middle Kingdom and the New Kingdom, adopting the style of the New Kingdom at the same time, and that they show contacts with Nubia. These features seem to meet the conditions to consider these sites part of the same region. Lastly, the cemeteries of Denderah have to be mentioned here, which are located between Hu and Ballas and are mostly dated to the Old Kingdom and the First Intermediate Period.¹⁷⁹ No material properly dated to the Second Intermediate Period has been unearthed, but material from the Middle Kingdom has been discovered near the temple and in a tomb.¹⁸⁰

Thebes

Moving further south, in the Theban area, excavations at the temple of Amun and at the Ramesseum in Karnak have also uncovered material of the Late Middle Kingdom and Second Intermediate Period, mostly composed of small finds and located in the northern part of the site.¹⁸¹ Furthermore, among the finds uncovered in Qurneh, of interest to this work is a tomb dated to the Late

172 Bourriau 2010, 29-32.

173 For the tentative dating of some of these tombs: Bourriau 1981a; Williams 1975, 212-16.

174 Bourriau 2010, 29-32; De Souza 2019, 62-64; Williams 1975, 212-16.

175 Petrie, Quibell, and Spurrell 1896.

176 Bourriau 1987a; Bourriau 1990; Bourriau and Lacovara 1984, 32-33; Bourriau 2009; De Souza 2019, 62-63.

177 Petrie, Quibell, and Spurrell 1896, 66-67.

178 See the excavation report: Petrie, Quibell, and Spurrell 1896.

179 For more information: Petrie and Griffith 1900, 3-22.

180 Bourriau 1981b, 21; Eggebrecht 1975, 335-36; Petrie and Griffith 1900, 23-26.

181 For more information: Bohec and Millet 2012; Graham and Bunbury 2004; Jacquet-Gordon 1977; Jacquet-Gordon 1990; Jacquet-Gordon 1991; Loyrette, Nasr, and Bassiouni 1994; Millet 2007.

Second Intermediate Period and famous because of the Rishi coffin present in it.¹⁸² Lastly, cemeteries dated between the Middle Kingdom and the New Kingdom have been excavated at Dra' Abu el-Naga. The present work analyses the ones of the Late Middle Kingdom¹⁸³ and the ones of the Second Intermediate Period, most of which are dated to the Late Second Intermediate Period.¹⁸⁴

All in all, the area of Thebes follows a trajectory different from the ones noticed in the Memphis-Fayyum area and in Middle Egypt.¹⁸⁵ In the Theban area, the style of the New Kingdom makes its earliest appearance in Egypt.¹⁸⁶ Especially in the tombs of the Late Second Intermediate Period, the pottery appears to use new shapes and materials very soon.¹⁸⁷ Given the geographical proximity and the homogeneity of the material culture, in the analysis conducted in the present work the Theban area is considered one site and no distinction is made between the different cemeteries, in the same way followed for other sites such as Qau el-Kebir.

South of Thebes

South of the Thebes, at Armant parts of a settlement dated to the Second Intermediate Period have been unearthed, as well as tombs and parts of a settlement dated to the Middle Kingdom.¹⁸⁸ Tombs dated to the Second Intermediate Period and belonging to the Pan-grave culture have been discovered also at Tod,¹⁸⁹ located south of Armant and on the East bank of the Nile. The site has a long history and is mostly known for its temple of the Middle Kingdom, where also material of the Early Second Intermediate Period has been found.¹⁹⁰ At Esna, south of Tod and on the West bank of the Nile, groups of tombs dated from the Middle Kingdom to the Late Period have been excavated, including tombs dated to the Second Intermediate Period and of the Pan-grave culture.¹⁹¹ At El-Kab, south of Esna and on the East bank of the Nile, ma-

182 For more information: Bourriau 1981a, 34; Petrie and Walker 1909, 6–11; Tate et al. 2009; Troalen et al. 2009.

183 Discussed in: Miniaci and Quirke 2008; Miniaci and Quirke 2009; Seiler 1995.

184 Discussed in: Polz et al. 1999; Seiler 1995; Seiler 2005; Seiler 2010.

185 The evolution of the style in the Theban area, already from the Middle Kingdom is shown in: Seiler 2012

186 Bourriau 1997, 168; Bourriau 2010, 32–35; Polz and Seiler 2003, 58–68.

187 As discussed in: Seiler 2005; Seiler 2010.

188 See the excavation reports: Mond and Myers 1937; Mond and Myers 1940.

189 For more information: Barguet 1952.

190 For more information: Do. Arnold 1975; Barguet 1952; De Souza 2019, 64–65; Pierrat et al. 1995.

191 For more information: Downes 1974; Kemp 1978.

terial of the Late Middle Kingdom has been recovered from tombs,¹⁹² as well as some material probably dated to the Early Second Intermediate Period.¹⁹³

More south and on the West bank of the Nile, Edfu is mostly known for the temple of Horus, though material from the Late Middle Kingdom¹⁹⁴ and material probably dated to the Early Second Intermediate Period¹⁹⁵ has been retrieved there, mostly in tombs that were probably reused also in the New Kingdom.¹⁹⁶ Lastly, on the island of Elephantine a settlement¹⁹⁷ occupied for many periods of Egyptian history, including the Middle Kingdom and the Second Intermediate Period,¹⁹⁸ has been unearthed. In particular, the strata dated to the Late Middle Kingdom are the ones corresponding to what the excavators have called building level 13 and building level XIII¹⁹⁹, while the strata dated to the Early Second Intermediate Period correspond to what the excavators have called building level 12,²⁰⁰ and the strata dated to the Late Second Intermediate Period correspond to what the excavators have called building level 11 and building level XI.²⁰¹ The material culture uncovered in these strata seems to have had similarities with the area of Kahun and with the area of Abydos.²⁰² Though the area of Elephantine could constitute a region,²⁰³ no studies have dealt in detail with how the regionalization of material culture developed in Elephantine.

In general, from the data retrieved on the evolution of the material culture it cannot yet be said whether the sites south of Thebes formed an independent region.

192 For more information: Bourriau 1981b; Hendrickx and Huyge 1997; Kemp, Merrillees, and Edel 1980; Quibell, Clarke, and Tylor. 1898; Redford 1997.

193 Williams 1975, 187–88.

194 For more information: Bruyère et al. 1937; El-Sayed 1979; Michałowski et al. 1939; Michałowski et al. 1950; Moeller 2009; Moeller 2010; Moeller, Marouard, and Ayers 2011; Redford 1997; Rzeuska 1999; Vernus 1996.

195 Williams 1975, 182–86.

196 For more information: Rzeuska 1999.

197 Though also tombs have been excavated, they have not been published yet and, thus, could not be included in the analysis.

198 See the excavation reports: Do. Arnold 1976; Bayerlein 1984; Dreyer et al. 2005; Kaiser et al. 1999; Rzeuska 2012; Von Pilgrim 1996.

199 Von Pilgrim 1996, 336–50.

200 Von Pilgrim 1996, 332–36.

201 Von Pilgrim 1996, 328–32.

202 As shown by the finds reported in: Bayerlein 1984; Dreyer et al. 2005; Kaiser et al. 1999; Von Pilgrim 1996.

203 Bourriau 1997, 159; Bourriau 2010, 12.

The oases

The occupation of the oasis of Dakhla, in the Western Desert, spans the entire length of Egyptian history and includes settlements, cemeteries and temples. The material dated to the Late Middle Kingdom and the Early Second Intermediate Period comes mostly from the tombs in Qila' el-Dabba and 'Ein Tirghi, and from the settlement of Ain Asil, which includes dwellings and areas for production and storage of food.²⁰⁴ It can be seen that in the sites in the Dakhla Oasis, the material culture follows the style of the Middle Kingdom until the end of the Thirteenth Dynasty, with only slight variations and sometimes with mixtures of shapes and materials already in use.²⁰⁵ This style seems to be produced also locally until the Late Second Intermediate Period, when the style of the New Kingdom appears.²⁰⁶

A similar development is visible also in another oasis of the Western Desert, Bahariya, where material of the Second Intermediate Period has been recovered from the cemetery of Qaret el-Toub. The style of the material found there follows in general the one of the sites in the Nile Valley. There is a transition from the style of the Middle Kingdom to the one of the New Kingdom in the Late Second Intermediate Period.²⁰⁷

Lastly, the oases show connections also with Nubia and were probably used as corridors by the Hyksos and by Kerma to communicate, thus surpassing the obstacle constituted by the kingdom in the Theban area.²⁰⁸

The Sinai

Lastly, going to the Sinai, in Tell Hebua material of the Late Second Intermediate Period and the Early New kingdom has been found.²⁰⁹ This site cannot be placed in any precise region on the basis of its material culture, but it is included in the analysis in the present work because of the relevant material there discovered.

204 See the excavation reports: Aufrère and Ballet 1990; Ballet 1987; Ballet 1988; Ballet 1990; Baud 1997; Hope 1980; Hope 1983; Hope 1987a; Hope 1987b; Hope 1987c; Hope 1999; Marchand 2003; Marchand, Soukiassian, and Bourriau 2010.

205 As discussed and shown in detail in: Ballet 1990; Marchand 2012; Marchand, Soukiassian, and Bourriau 2010.

206 As discussed and shown in detail in: Marchand 2003; Marchand, Soukiassian, and Bourriau 2010.

207 As discussed in: Colin, Laisney, and Marchand 2000.

208 As discussed in: Agut and Moreno-García 2016, 292–94; Baud 1997; Colin 2005.

209 For more information: Maksoud 1998; Seiler 1997.

The regions

From the situation described, it seems that the following regions can be distinguished in Egypt during the Second Intermediate Period: the Eastern Delta, the Memphis–Fayyum, Middle Egypt up to the area of Abydos, southern Upper Egypt in the area around Thebes.²¹⁰ Unfortunately, as of today there are not enough data from the central and western parts of the Delta to know if they shared the culture of the Eastern Delta and could be included in the same region. Furthermore, Elephantine and the other sites of southern Upper Egypt cannot be placed in any precise region, based on the development of their material culture, nor it can be said if they formed an independent region. The same situation stands for the oases and for Tell Hebua.

Nevertheless, from the data available it can be concluded that the process of regionalization started already during the Late Middle Kingdom,²¹¹ so before the Hyksos rose to power, and that the innovations happening during the Second Intermediate Period, or even right before it, set the foundations for the development of the culture of the New Kingdom.²¹² Moreover, it can be noticed that the burial customs and the style of the Late Middle Kingdom were kept longer in Upper than in Lower Egypt, and that changes occurring to them in Lower Egypt during the same period never reached the south. This was maybe a sign that the dynasties ruling over Upper Egypt wished to keep their ties to the culture of the Middle Kingdom, until a new identity emerged in the Late Second Intermediate Period.²¹³

CONTRIBUTION

The main goal of the present work is to examine the regionalization process that happened during the Second Intermediate Period, concerning the material culture. So far, this process has been analysed mostly through the shapes, the techniques and the material used in the production of pottery.²¹⁴ To add to the contributions of these studies, in the present work the regionalization process is examined through objects other than pottery. These objects include beads, weapons, scarabs, and stone vessels. The objects are put in context and studied through the relations they show.

Thus, the focus is on the objects used, while at the same time the geographical and archaeological contexts are used to interpret the regionalization of material culture during the Second Intermediate Period. In other words, in

210 Bourriau 1997, 159; Bourriau 2010, 12.

211 As shown by the local variations in pottery discussed in: Schiestl and Seiler 2012.

212 As discussed in: Polz and Seiler 2003; Seiler 2005; Seiler 2010; Williams 1975, 144–65.

213 Seiler 2010, 43.

214 The works cited in this chapter are examples of this.

the present work the types of objects produced in each place and found in contexts dated to the relevant period are taken into consideration and compared. The relevant period includes both the Late Middle Kingdom and the Second Intermediate Period; for the reasons for including the Middle Kingdom, refer to Chapter 2. This comparison is conducted through the methods of network analysis, used in the present work to examine the contacts between places and on how these contacts are shown through the types of objects shared. Therefore, one of the main contributions of the present work is the use of network analysis to further the understanding of the regionalization process.

Furthermore, to better understand the evolution of these contacts and of the regionalization process, the period analysed is divided into three phases: Late Middle Kingdom, Early Second Intermediate Period and Late Second Intermediate Period (see Chapter 2). For the sites which span the entire Second Intermediate Period and for whose contexts a precise dating is not always possible, such as Qau el-Kebir, Hu, and Abydos, only the contexts that can be more securely dated are taken into consideration for the analysis.

ETHNICITY

During the Second Intermediate Period in Egypt, and mostly in its northern part, groups of foreigners, meaning people who originally came from other lands outside Egypt, had an important presence. But what does this mean, precisely? What did it mean to be Egyptian or foreigner (i.e. Asiatic, Nubian, Cypriot) in Egypt during the Second Intermediate Period? Is it useful and correct to talk about ethnicity in such a situation? Did the groups coming from outside Egypt contribute in a special way to the material culture in Egypt?

This chapter first illustrates what is known from both written and archaeological sources about foreign groups, namely groups of people coming from or whose origins were from lands outside Egypt, living in the country during the Late Middle Kingdom and the Second Intermediate Period. Afterwards, the contribution of anthropology to the study of ethnicity, and how this can be applied to archaeology, is discussed. This chapter elaborates also on the main concepts recurring in the study of ethnicity in archaeology, especially when examining empires and groups among which there is an imbalance of power (such as acculturation, assimilation, emulation, hybridity, creolisation, and resistant adaptation), and addresses the debate about Romanization as an example of how these concepts are used. Lastly, it is checked if and how the study of ethnicity can be correctly applied to Second Intermediate Period Egypt.

FOREIGN GROUPS IN THE LATE MIDDLE KINGDOM AND THE SECOND INTERMEDIATE PERIOD

A number of different foreign populations may be identified in Egypt during the Late Middle Kingdom and the Second Intermediate Period based on a careful analysis of the relevant material culture. These include Asiatics, people from Cyprus and the Aegean, and those who produced the Pan-grave culture. The evidence for these different groups is discussed in the following subsections.

The best-known foreign groups living in Egypt during the Second Intermediate Period are the ones coming from the Levant, namely from Syria-Palestine and Lebanon, from which also the Hyksos Dynasty arose. In Egyptology, these groups from the Levant are generally referred to as Asiatics ('Amu, to use the Egyptian word), without any further internal distinction.¹ This means that we cannot determine the precise groups that constituted this Asiatic community and the history of their arrival in Egypt.²

As it appears from names written on documents,³ the Asiatic presence in the Delta was nothing new or peculiar to the Second Intermediate Period. Already during the Late Middle Kingdom, Tell el-Dab'a, was inhabited by a mixed community composed of people from the Levant and the Near East.⁴ During the Second Intermediate Period, other peoples arrived from the Aegean,⁵ and from Cyprus.⁶

Tell el-Dab'a was an important hub in the trade and communications networks of the eastern Mediterranean, as well as between the Mediterranean and the inner parts of Egypt, not only by sea, but also by land.⁷ As it seems from the pottery, the closest relations were probably with the northern Levantine coast during the Middle Kingdom,⁸ and with the southern Levantine coast, Cyprus, and the Mediterranean during the Second Intermediate Period.⁹ However, there are scholars suggesting that the main relations were with southern Palestine both during the Middle Kingdom and the Second Intermediate Period.¹⁰

From the cemeteries in area F/I of Tell el-Dab'a, ranging from the late Twelfth to the early Thirteenth Dynasty,¹¹ it seems that Asiatic cultural features were most evident in tombs in earlier strata, probably because the foreign community was less integrated in Egypt. This appears both from the

1 Bader 2012a, 218; Bader 2017, 20–21; Bietak 2010, 146; Schneider 2010, 151.

2 For example, one of the possibilities include immigrant men marrying local women: Bader 2012a, 219–20.

3 Bader 2012a, 222; Bader 2017, 20–21; Bietak 2010, 146; Schneider 2010, 151–54; Sparks 2004, 28.

4 Bader 2012a, 221–223; Bader 2017, 21–23; Bietak 1996; Bietak 1997; Bietak 2002; Schneider 2010, 157–59.

5 D.A. Aston 2002, 54; Bietak 1997, 104.

6 Karageorghis 1995.

7 Ahrens and Mynářová 2011; Bader 2017, 21–22; Holladay Jr. 1997, 203–8; Oren 1987.

8 D.A. Aston 2002, 52–55; Bietak 1987; Bietak 1996, 30–31; Bietak 1997, 97; Cohen-Weinberger and Goren 2004, 80–88.

9 Ben-Tor 2004; Ben-Tor 2010; Bietak 1987; Kopetzky 2002, 244.

10 McGovern and Harbottle 1997, 149–53.

11 For these cemeteries: Schiestl 2002; Schiestl 2008b; Schiestl 2009.

layout of the cemeteries, from the architecture of the tombs and of their superstructures, from the position of the bodies, from the funerary equipment and the offering deposits.¹² Noteworthy is the statue of an official whose skin colour, hairstyle, and dress are of a type usually associated with Asiatics.¹³ Noticeable is also the presence of temples of Levantine type in area A/II of Tell el-Dab'a, which were built during the Early Second Intermediate Period and which would point to Near Eastern cults going on.¹⁴

However, from archaeological evidence, such as the objects used as burial equipment,¹⁵ and from the names mentioned on the name-lists,¹⁶ it also appears that these Asiatics progressively adopted, in a relatively short period covering only a few generations, Egyptian cultural traits, and became part of the Egyptian administration. They were active as mercenaries, held administrative functions, were involved in mining operations in the Sinai and were engaged in seafaring. From this, it seems that they had an important role as far as interconnections with outside Egypt are concerned.¹⁷

Cyprus and the Aegean

Cypriot vessels¹⁸ are found in Egypt, especially in Tell el-Dab'a but also in sites in Middle and southern Upper Egypt, from between the Late Middle Kingdom and the Early Second Intermediate Period,¹⁹ with a peak in the Late Second Intermediate Period.²⁰ These vessels were made in Cyprus and were used to trade precious liquids or oils, and witness the trading activity conducted by Cypriots in the Mediterranean.²¹ These vessels show strong connections with Cyprus, and could even to suggest the presence of a Cypriot community in Egypt.²²

Moreover, contacts with Crete and the Minoans seem to be witnessed by pottery dated to the periods known as Middle Minoan I and II, corresponding

12 Schiestl 2002; Schiestl 2008b; Schiestl 2009, 206–15.

13 On the statue, see: Do. Arnold 2010, 191–200; Schiestl 2006.

14 Bietak 1996, 36–40; Bietak 2003a; Forstner-Müller 2003, 163; Forstner-Müller 2010, 134; V. Müller 2002, 271–75.

15 Bader 2012a, 218–19; Bader 2017, 20–25; Forstner-Müller 2008, 100; Schiestl 2009, 200–6.

16 Bader 2017, 20–21; Schneider 2010, 151–54; Sparks 2004, 26–28, 46–48.

17 Do. Arnold 2010, 183–84; Bietak 1987, 41–43; Bietak 1996, 14, 19; Bietak 1997, 96–100; Bietak 2010, 140–42; Schiestl 2008b, 253–54; Schiestl 2009, 211–15; Schneider 2010, 151–54.

18 For the Cypriot pottery: Aston et al. 2004; Bietak 1997; Fuscaldo 2009; Gallorini 2011; Karageorghis 1995; Maguire 1995; Maguire 2009; Merrillees 1968; Merrillees 1974b.

19 Maguire 2009, 11.

20 Merrillees 1968, 193.

21 Karageorghis 1995, 73; Maguire 2009, 52–68; Merrillees 1968, 188–93.

22 Bietak 1996, 35.

to the Middle Kingdom and the Early Second Intermediate Period, found in Northern and Middle Egypt and dating mostly to the late Middle Kingdom and the early Second Intermediate Period,²³ as well as by the wall paintings found in Tell el-Dab'a, in a palatial precinct of the Early New Kingdom, and inspired by Minoan motives.²⁴ Furthermore, neutron activation analysis conducted on Middle Minoan and Kamares sherds in Lahun has shown that both imported and imitated pottery were present at the site.²⁵ It cannot be said, though, if a community of Minoans could have been present in Egypt.

The Pan-grave culture

Another group of non-Egyptian origins present in Egypt during the Second Intermediate Period is the one of so-called Pan-grave culture, named in this fashion after the distinctive shallow and pan-shaped substructure of its tombs and attested in the very late part of the Late Middle Kingdom and, mostly, in the Second Intermediate Period.²⁶ This group is known only from archaeological evidence, in other words tombs and very few settlements and all the small finds found there,²⁷ mostly located in the middle and southern part of Egypt, at sites like Rifeh,²⁸ Mostagedda,²⁹ Qau el-Kebir,³⁰ Balabish,³¹ Hu,³² Esna,³³ Abydos³⁴ and in Kahun.³⁵

Their characteristic grave goods include black-topped vessels, leather garments used to cover the deceased and often embellished with beads, distinctive jewellery items, such as bracelets and necklaces made of disc beads of ostrich eggshell or of rectangular slips of mother-of-pearl, as well as leather weapons, and animal bones mostly from cattle and sheep.³⁶ Because of the

23 Kemp and Merrillees 1980.

24 For more information on these paintings: Bietak 2005; Bietak and Marinatos 1995; Bietak, Marinatos, and Palivou 2007.

25 Fitton, Hughes and Quirke 1998.

26 Schneider 2010, 151–54.

27 For more information on Pan-Grave culture: Bourriau 1981a; De Souza 2013; De Souza 2019; Liszka 2012a; Säve-Söderbergh 1956. There is also a discussion on Pan-Grave cemeteries in: Bourriau 1997.

28 Described in: Petrie, Thompson, and Crum 1907.

29 Described in: Brunton and Morant 1937.

30 Described in: Brunton, Gardiner, and Petrie 1930.

31 Described in: Wainwright and Whittemore 1920.

32 Described in: Petrie and Mace 1901.

33 Described in: Downes 1974.

34 Described in: Peet 1914; Randall-MacIver, Mace, and Griffith 1902.

35 Described in: Kemp 1977.

36 See the finds described in Brunton, Gardiner, and Petrie 1930; Brunton and Morant 1937; De Souza 2013; Downes 1974; Kemp 1977; Merrillees 1970; Peet 1914; Petrie and Mace 1901; Petrie, Thompson, and Crum 1907; Randall-MacIver, Mace, and Griffith

similarities between their burial customs and grave goods and the ones found in Nubia, these people are believed to be of Nubian origins.³⁷ It is nowadays disputed that their origins were in the Nubian Eastern Desert, and similarities between their grave goods, especially the pottery, and the objects attributed to pastoralists cultures from Nubia indicate contacts between the groups of Pan-grave culture and the latter.³⁸ It is possible that peoples of Pan-grave culture moved to Egypt from Nubia when the weakness of the central power made it easier to cross the borders between the two lands.³⁹ However, it is also possible that they were already living in Egypt and the political fragmentation of the period under examination made them feel necessary to display their identity more conspicuously, thus becoming archaeologically visible.⁴⁰

Based on the objects used as grave goods, especially bucrania and animal skin and weapons, but also flints and tools made of bone and stone, people of the Pan-grave culture seem to be mostly pastoralists, but involved also in other activities such as mercenaries.⁴¹ The usually small size of the cemeteries and the demographic of the deceased further suggests that the people of Pan-grave culture consisted of small groups composed mostly of families, which seem to have been offering different types of services to the Egyptian population in exchange for resources.⁴²

Furthermore, people of the Pan-grave culture, because of a supposed similar warlike nature and supposed similar geographical origins, have been associated with the Medjay,⁴³ which were people of Nubian origins employed as police force in the New Kingdom and the later part of Egyptian history, known mostly from written documents. Nevertheless, this identification is not supported by the newest evidence.⁴⁴

Lastly, the Pan-grave tombs in the cemeteries of Mostagedda and Qau el-Kebir have been divided into three phases on the basis of the Egyptianization of the funerary equipment, namely the proportion to which the funerary equipment contain objects considered of Egyptian or Nubian style.⁴⁵ Here too, it seems that the objects of traditional Egyptian style become progressively

1902; Wainwright and Whitemore 1920.

37 Bader 2012a, 218; De Souza 2013; De Souza 2019, 145-157; Gatto 2014; Liszka 2012a; Liszka 2015; Näser 2012; Näser 2013; Weschenfelder 2014.

38 As argued in: Liszka 2012a; Liszka 2015.

39 As argued in: Gatto 2014; Näser 2012; Näser 2013; Weschenfelder 2014.

40 As argued in: Liszka 2015.

41 De Souza 2013; De Souza 2017, 148-49; Liszka 2012a.

42 As argued in: De Souza 2019, 48-49; Gatto 2014; Näser 2012; Näser 2013; Weschenfelder 2014.

43 Especially in: Bietak 1966; Bourriau 1981; Bourriau 2010, 22-23; Merrillees 1970; Schneider 2010, 151-53.

44 See especially the discussion in: Liszka 2012a; Liszka 2015.

45 Bourriau 1981; Bourriau 2010.

more common than the traditional Nubian ones in the funerary equipment. Nevertheless, this trend could be less straightforward than thought.⁴⁶

MATERIAL CULTURE AND CUSTOMS

In this section, different types of material culture and archaeologically visible customs are discussed. These include pottery, metal artefacts, scarabs, offering pits, and burial customs.

The pottery

Pottery types are one of the features most analysed to study ethnicity and cultural groups, also as far as the Second Intermediate Period is concerned. Previous studies on the pottery of this period have demonstrated that pottery types became regionally diverse during this period,⁴⁷ particularly in the eastern Nile Delta, in the region of Memphis and the Fayyum,⁴⁸ and in the region of southern Upper Egypt around Thebes.⁴⁹

Furthermore, specific types of pottery found in Egypt during the Second Intermediate Period are usually connected to particular ethnic or cultural groups, starting with the Tell el-Yahudiyah pottery.⁵⁰ This latter is found both in Egypt, mostly in the eastern Nile Delta and in the Memphis-Fayyum region, as well as in Cyprus, Syria-Palestine, and Nubia.⁵¹ It originated in the Levant during the MB IIa, corresponding to the Late Middle Kingdom, and from there it spread to inner Syria-Palestine, Cyprus, and Egypt, where it was first copied and then developed in a local branch, with specific local features. Particularly in Egypt, the Tell el-Yahudiyah ware was imported and copied during the transition between the MB IIa and the MB IIb, corresponding to the transition between Late Middle Kingdom and Second Intermediate Period. Successively, during the MB IIb, corresponding to the Second Intermediate Period, it became locally produced and gave origin to an Egyptian branch. Its last attestations are dated to the MB IIC, corresponding to the very late part

46 De Souza 2013; De Souza 2019, 145-153.

47 For regionalization in Egypt during the Second Intermediate Period: Bourriau 1997; Bourriau 2010.

48 For the study of regionalization related to the region of Memphis: Bader 2007; Bader 2008; Bader 2009.

49 For the study of regionalization related to the Theban region: Seiler 2010; Seiler 2005; Seiler 2012.

50 D.A. Aston 2002, 51-53; D.A. Aston 2008; Aston and Bietak 2012; Aston et al. 2004, 122-55, 229-37; Forstner-Müller 2002, 167-68; Kaplan 1980; Kopetzky 2008, 196-206.

51 D.A. Aston 2008, 171; Bietak 1997, 94; Forstner-Müller 2002, 168; Van den Brink 1982, 68-69.

of the Second Intermediate Period, or to the LB I, corresponding to the Early New Kingdom.⁵²

All in all, the quantity of vessels imported from the Levant rose noticeably during the Late Middle Kingdom,⁵³ and show links mostly with the northern Levantine coast.⁵⁴ During the Second Intermediate Period, imports decreased to very low levels, while the locally-produced imitations of, or vessels inspired by, these imports increased.⁵⁵ Moreover, from these vessels it seems that the closest connections had switched to the southern Levantine coast and Cyprus by then.⁵⁶ The typology of the pottery seems to confirm the contacts as described here.⁵⁷ Nonetheless, according to petrographic studies on Canaanite jars from Tell el-Dab'a, both during the Middle Kingdom and the Second Intermediate Period contacts were mostly with the northern Levantine coast.⁵⁸ Lastly, the Neutron Activation Analysis on imported Canaanite amphorae suggests that the contacts were mostly with southern Palestine.⁵⁹

Important for examining the links between Egypt and foreign groups is in particular the study of the Canaanite jars.⁶⁰ These latter were amongst the few types of pottery that kept being imported into Egypt from the Levant during the Second Intermediate Period, because they were used in trading food and liquids. Furthermore, for the same purpose it is informative to study vessels used to trade precious oils and liquids, such as the juglets of Levantine Painted ware,⁶¹ and the Cypriot vessels.⁶² All in all, these types of vessels seem to confirm the history of contacts described above.

- 52 D.A. Aston 2008, 172; Aston and Bietak 2012, 551–56; Bietak 1989a; Kaplan 1980, 60–66.
- 53 Arnold, Arnold, and Allen 1995, 14, 30; D.A. Aston 2002, 43; Aston et al. 2004, 300; Bietak 1997, 105.
- 54 D.A. Aston 2002, 52–55; Bietak 1997, 97; Bietak 2002, 42; Cohen-Weinberger and Goren 2004, 80–88.
- 55 Aston et al. 2004, 323–24; Cohen-Weinberger and Goren 2004, 80–81; Kopetzky 2008, 195.
- 56 Aston et al. 2004, 220; Bietak 1991; Karageorghis 1995, 74; Kopetzky 2002, 244.
- 57 Aston et al. 2004, 300–93.
- 58 Cohen-Weinberger and Goren 2004.
- 59 McGovern and Harbottle 1997.
- 60 Arnold, Arnold, and Allen 1995, 13–20; D.A. Aston 2002, 43–46; Cohen-Weinberger and Goren 2004; Kopetzky 2008, 213; McGovern and Harbottle 1997.
- 61 Arnold, Arnold, and Allen 1995, 17, 30; D.A. Aston 2002, 53; Bagh 2002; Bagh 2013; Bietak 1997, 98; Bietak 2002, 38–39; Cohen-Weinberger and Goren 2004, 81; Czerny 2002, 133.
- 62 Beck et al. 2004; Karageorghis 1995; Maguire 2009.

The metal artefacts

Metal artefacts can also be associated with ethnic groups, such as the duckbill axes, usually connected to groups coming from the Levant. For the Middle Bronze Age, for phase IIa, the metal artefacts from Tell el-Dab'a have been the most studied. The objects include both weapons, tools, and jewellery, in precious or non-precious metals. The analysis of the metal suggests a similar development as with the pottery, namely that relative uniformity gave way to regionalized or local styles from the Middle Kingdom to the Second Intermediate Period.⁶³ These objects were clearly produced in local workshops.⁶⁴

Moreover, analyses of the metal artefacts found in Tell el-Dab'a during the Hyksos Dynasty show that a smaller percentage of tin was used in bronze alloys than in previous periods. This change in making bronze, combined also with changes in the use of silica, suggests that the Hyksos administration had no or only limited direct access to raw materials. Thus, the regionalization detected in the material culture was not only due to the rising of new governments that wished to affirm their new identities, but also to the changed economic and trade relations derived from the new political conditions.⁶⁵

In addition to that, it should be considered that metal objects were also used as symbols to indicate associations other than ethnic identity, such as social class, gender, or age group.⁶⁶

The scarabs

Scarabs are another important class of objects, which have been studied in detail and which sometimes carry features that could have ethnic or cultural significance, such as the 'anra scarabs, usually associated with the Hyksos Dynasty.⁶⁷ In the eastern Delta in particular, the scarabs were executed in a style that was essentially a mix of earlier Egyptian scarabs and Palestinian scarabs produced during MB IIa and developed all through MB IIB.⁶⁸ These scarabs imitated the Egyptian Middle Kingdom ones and bear pseudo-hieroglyphic inscriptions.⁶⁹

63 As shown in: Philip 1995a; Philip 2006.

64 As shown in: Czerny 1999, 117–18; Philip 1995a; Philip 1995b; Philip 2006.

65 Bourriau 1997, 160.

66 Philip 1995a; Philip 1995b; Philip 2006.

67 Ben-Tor 2004, 31–32; Mlinar 2004, 123–25.

68 As demonstrated by the scarabs discussed in: Ben-Tor 2004; Ben-Tor 2007; Mlinar 2004; Quirke 2004, 173–75.

69 Ben-Tor 2004 32–34; Ben-Tor 2010 91–93.

The offering pits

Offering deposits in temples are also a fruitful category of study, that have been used in studying ethnic and cultural traits in the Second Intermediate Period. They are peculiar to Tell el-Dab'a and have been also the topic of a specific publication in the series dedicated to the Hyksos' capital.⁷⁰ More specifically, these offering deposits are found in areas A/II, F/I, F/II, and R/III, from stratum E to stratum D/3, and show the introduction of the use of burying both artefacts used in rituals and remains of ritual meals, in other words pottery and bones of animals, in specific pits.⁷¹ The practice belongs to the Egyptian cultural sphere.⁷² However, no pig bones have been found in the temples of Levantine types in Tell el-Dab'a, so that it could be perhaps concluded that pigs were not eaten or at least not sacrificed by the Asiatics living in Tell el-Dab'a.⁷³

The burial customs

Burial customs in late Middle Kingdom and Second Intermediate Period have also been the topic of specific studies, mostly concerning the graves' structure, architecture and orientation, the funerary equipment and the orientation and position of the bodies.⁷⁴ The burial customs are one of the features most associated with ethnic and cultural significance.⁷⁵

Concerning Tell el-Dab'a, based on the evidence found in stratum F, it seems clear that between the end of MB IIa and the beginning of MB IIb burial customs changed. These changes include a different orientation and an increased use of foetal positions for the bodies of the deceased, while new tomb types were introduced.⁷⁶ The first of these types is the rectangular mud brick chamber tomb, which was placed in a ditch and featured both a sloping roof and protruding bricks in the walls. The second type of grave is the rectangular mud brick chamber tomb placed in a pit, featuring either a single or a double-vaulted roof, as well as protruding bricks in the walls. The tombs

70 V. Müller 2008.

71 Bader, Kunst, and Thanheiser 2008; Forstner-Müller 2002, 132–34; V. Müller 1998, 793–95; V. Müller 2002, 269–71; V. Müller 2008; Schiestl 2009, 190–92.

72 Müller 2008.

73 Bader, Kunst, and Thanheiser 2008; Forstner-Müller 2002, 134; V. Müller 1998; V. Müller 2002; V. Müller 2008.

74 Bietak 1997, 103–4; Czerny 1999, 29–31; Forstner-Müller 2002; Schiestl 2002; Schiestl 2008b; Van den Brink 1982.

75 Bourriau 1991a; Bourriau 2001; Miniaci and Quirke 2009; Van den Brink 1982.

76 Bourriau 2001; Forstner-Müller 2002, 165–69; Schiestl 2002, 331–50; Van den Brink 1982, 45–46, 69.

bearing a single-vaulted roof could also be without protruding bricks in the walls and were also used to bury children.⁷⁷

Another feature that seems to have been peculiar to the Asiatic people living in Egypt during the Middle Kingdom and the Second Intermediate Period is the use of donkey burials, which may have served to identify the deceased as being involved in trade or travel.⁷⁸ At Tell el-Dab'a, burials with donkeys are found from stratum H to stratum E/1, so from the late Middle Kingdom to the Late Second Intermediate Period.⁷⁹ Another characteristic feature of Asiatics living in Egypt during the Middle Kingdom and during the Second Intermediate Period is the practice of multiple burials,⁸⁰ including servant burials,⁸¹ namely young girls buried at the entrance of the main tombs. All the features suggest that the Asiatics, even if they had adopted the Egyptian culture in everyday life, were perhaps more conservative as far as their burial customs were concerned.⁸²

An evolution is detectable also in the burial customs of the Pan-grave group. The main features of these evolution, apart from the aforementioned Egyptianization, include a change in the body position of the deceased from one contracted and laying on the side, mostly the left, to one supine and with arms extended on the sides or over the pudenda. This change can be observed between the second and the third of the mentioned phases.⁸³ Furthermore, the shape of the grave changes from circular to oval in the second phase and to rectangular in the third phase.⁸⁴

STUDYING ETHNICITY

Models for the study of ethnicity, and how it is expressed and shaped, have originally been developed in the anthropological field. Amongst these models, the first one considering together ethnicity, identity and interaction be-

77 Forstner-Müller 2002, 168–71; Schiestl 2002, 331–50; Schiestl 2008b, 246–53; Van den Brink 1982, 19–26.

78 Bietak 1981, 246; Bietak 1997, 103; Bietak 2010, 159; Forstner-Müller 2002, 165; Forstner-Müller 2010, 132; Schiestl 2002, 331–50; Van den Brink 1982, 46–47, 75–83.

79 Bietak 1981, 246–47; Bietak 1996, 25; Bietak 1997, 103; Bietak 2010, 159; Forstner-Müller 2010, 132; V. Müller 2002, 271; Schiestl 2002, 331–32, 341–43, 350; Van den Brink 1982, 35, 38, 42, 46–47.

80 Forstner-Müller 2002, 172; Schiestl 2002, 331–50; Van den Brink 1982, 70–72.

81 Bietak 1981, 245; Bietak 1989c; Bietak 2010, 159; Forstner-Müller 2002, 165; Forstner-Müller 2010, 132; Van den Brink 1982, 48–50.

82 Forstner-Müller 2002, 184; Schiestl 2002, 331–50; Schiestl 2008b, 250–54; Van den Brink 1982, 95.

83 Bourriau 1991a; Bourriau 2001; Bourriau 2010; De Souza 2013; De Souza 2019, 145–48.

84 Bourriau 1981a; De Souza 2013; De Souza 2019, 145–48.

tween groups has been the so-called Instrumentalist Perspective, elaborated by Fredrick Barth.⁸⁵

According to this model, ethnicity is dynamic, malleable, situational, self-defining, and, at times, pluralistic. Hence, ethnicity is something that is done, actions and behaviours that are consciously adopted, changed, or abandoned by people interacting in the same groups or by groups interacting with each other, according to the situation at hand. This definition helps to realize that ethnic groups are abstract concepts more than something material, so that they have no fixed boundaries and are constantly in flux.⁸⁶ Nevertheless, this definition also implies that ethnicity is a mere instrument that groups and single persons use, change and shape at discretion and only for their own self-interest and advantage, so that it can misrepresent the ethnic group and does not consider the compromises and limitations involved in the process of self-definition. Furthermore, the Instrumentalist model focuses only on opportunism and does not deal with the psychological ties to an ethnic group and other dynamics of adoption different from self-interest.⁸⁷

Other limitations to this model are that people and groups interacting with each other, despite having a wide range of elements to choose as ethnic symbols, have nonetheless limitations to their choices. These boundaries are dictated by a person's biological factors (such as age, sex, colour), by social factors,⁸⁸ and by the fact that they have to be mutually accepted and recognized as symbols by other persons belonging to the same group. Moreover, it should not be ignored that a person can show a plurality of ethnicities, which can be exaggerated or changed or suppressed, and can use markers from multiple ethnicities. However, also in this case the range is limited.⁸⁹

In opposition to the Instrumentalist model stands the Primordialist model,⁹⁰ according to which ethnicity is a monolithic element naturally belonging to a group and as such innate to it and unchangeable, regardless of the historical, political, and social situation. The problems with this view are self-evident, since research has shown how ethnicity can actually be more or less

85 Barth 1969, 9–37.

86 Barth 1969, 27–32; Dever 2007, 52–53; Emberling 1997, 297–300; Hodder 1982, 210–11; Jones 1997, 72–76; Jones 2008, 325–28; Liszka 2012a, 47–48; Lucy 2005, 94–95; McInerney 2014, 3–4; Reger 2014, 112–13; Sipekas 2014, 70–71; Smith 2003, 16–17; Smith 2007, 218–19.

87 Fesler and Franklin 1999, 2; Jenkins 2008, 12–13, 17–19; Jones 1997, 76–79; Liszka 2012a, 48; Lucy 2005, 95–98; Smith 2003, 17–19.

88 Hodder 1982, 189–90.

89 Barth 1969, 16–19; Insoll 2007, 4–5; Jenkins 2008, 15, 19–24; Liszka 2012a, 49–50; Lucy 2005, 96–97; Sipekas 2014, 70–71; Voss 2015, 16.

90 Geertz, 1973; Hall 2000, 17–18; Jones 2008, 321–25; Liszka 2012a, 47–48; Shils 1975; Siapkas 2014, 68–69; Voss 2015, 27.

changed and adapted, according to the situation. Furthermore, the Primordialist view of ethnicity is more emphasized in groups that feel threatened and use the ethnic element to assert and defend their existence against threats felt from the outside or from the inside of the group.⁹¹

All in all, it can be said that a part of the traits is chosen according to the situation and change, while another is perceived as a natural and unchanging feature of the group.⁹² This theory has been well summarized in the concept of *habitus*,⁹³ elaborated by Pierre Bourdieu regarding social groups.⁹⁴ It is defined as the predisposition towards certain behaviours, acquired from a young age onwards and transformable in different contexts. In other words, *habitus* is the complex of learned behaviours and customs, of repetitive actions taught to members of a group. The elements forming the complex of the *habitus* are used in everyday life and carry no strong ethnic consciousness.⁹⁵

At this point, it is useful to quote Siân Jones's definition of ethnic groups:

Ethnic groups are culturally ascribed identity groups, which are based on the expression of a real or assumed shared culture and common descent (usually through the objectification of cultural, linguistic, religious, historical and/or physical characteristics).⁹⁶

Thus, ethnic groups set themselves apart from the other ones with whom they come into contact, based on perceived differences in their culture and in their ancestry. Jones defines accurately also the concepts of ethnic identity and ethnicity. The former concerns the way in which a person identifies him/herself with a specific group as based on perceived common cultural traits and descent, while the latter concerns the psychological, social, and cultural phenomena that derive from this identification and from the interaction between groups.⁹⁷

It is apparent that the concept of ethnicity cannot be considered a synonym with the concept of culture. This latter is the whole of a group's language, material culture, territory, physical attribute, religion,⁹⁸ and history. On the

91 Hall 2000, 17–19.

92 Jones 2008, 326–27; Stek 2013, 347–48.

93 Fesler and Franklin 1999, 3–4, 8; Jones 1997, 87–92; Liszka 2012a, 61–62.

94 Bourdieu 1977.

95 Derks and Roymans 2009, 3; Hall 2000, 17–19; Jones 1997, 109–10, 114, 120; Knapp 2014, 37; Liszka 2012a, 67; Lucy 2005, 91; Siepkas 2014, 170 and 172; Smith 2003, 1–2, 9, 204; Smith 2007, 231–33; Smith 2014, 195.

96 Jones 1997, 84.

97 Jones 1997, xiii.

98 An insightful discussion about religion as ethnically meaningful in the context of Roman urban society is in: Rüpke 2014.

contrary, ethnicity can be considered only a part of a group's linguistic,⁹⁹ religious, and common cultural features, more precisely the part used by the group to define itself as one and as different from other groups.¹⁰⁰ However, important for the definition of an ethnic identity seems to be a joint association to shared myths of common descent, which are putative and normally recognized by people, but not factual. Being part of a common descent seems to determine who is included in an ethnic group and who is excluded from it.¹⁰¹

This mechanism of inclusion/exclusion works both in intra-group, person-to-person, interactions, and in inter-group, group-to-group, interactions.¹⁰² It is useful to distinguish between these two levels also in archaeological analysis because, according to each occasion and type of interaction, a person could choose to display or not display his/her ethnicity, leaving different traces in the material culture.¹⁰³ Hence, it can even occur that different ethnic groups share a plethora of cultural features. It is thus important to study ethnicity in the larger historical, geographical, cultural context. This context gives a more complete and more comparative image and allows us to detect ethnicities when they appear stronger, which is usually in situations of conflict.¹⁰⁴

Ethnicity and boundaries

From what has been discussed so far, it becomes evident that groups of objects, or assemblages, cannot be unequivocally given ethnic significance and be equated to ethnic groups. Assemblages can have other meanings, acquire other types of associations and signify other types of congregations, such as social, familiar, commercial ones.¹⁰⁵ Furthermore, the same object can change its significance and acquire or lose ethnic meaning or be appropriated by an-

- 99 For examples of when language is chosen as ethnic element and when not: Bader 2017, 14; Derks and Roymans 2009, 2; Hall 2000; Haarmann 2014, 17-22.
- 100 Bader 2017, 13, 17; Derks and Roymans 2009, 1; Hall 2000, 25-26; Hodder 1982, 11-12; Knapp 2014, 35; Siapkias 2014, 67; Smith 2014, 194-95; Voss 2015, 26, 29.
- 101 Derks and Roymans 2009, 7-8; Ganter and Kühr, 2014; Hall 2000, 25-26; Knapp 2014, 35; Reger 2014, 113-16; Siapkias 2014, 67 and 73.
- 102 McInerney 2014, 3.
- 103 Derks and Roymans 2009, 4-6; Hall 2000, 30; Knapp 2014, 35-37. This is visible also in the material culture of the Second Intermediate Period, as shown in: Bader 2012a; Bader 2017.
- 104 Barth 1969, 11-15, 20-24; Derks and Roymans 2009, 1; Dever 2007, 53; Hodder 1982, 187-88; Jones 1997, 106-10; Liszka 2012a, 56-57; Lucy 2005, 91-94, 109; McInerney 2014, 5-6; Smith 2003, 1-3; Smith 2007, 220-21; Voss 2015, 6.
- 105 Derks and Roymans 2009, 6; Knapp 2014, 37; Jones 2007, 48; Jones 2008, 327-328; Siapkias 2014, 72; Stek 2014, 38; Stek 2013, 347.

other group.¹⁰⁶ This means that assemblages are not indisputably bound to specific territories either. Therefore, it makes little sense to focus on their geographic origins.¹⁰⁷

This also implies that diagnostic types and geographic origins cannot unproblematically be used as tools in investigating ethnicity in archaeology,¹⁰⁸ making some scholars altogether sceptic about the possibility to analyse ethnicity in archaeological research.¹⁰⁹ However, what can actually help is studying the archaeological context, in other words the place in which the objects were found and how the objects were positioned and grouped.¹¹⁰ This can give hints about their use and about the significance attached to them, including the ethnic one.¹¹¹ This allows also to examine ethnicity not only from an external, *etic*, point of view, including our own point of view, but also from an *emic*, internal perspective.¹¹² This latter is the way in which somebody belonging to an ethnic group sees the group he/she belongs to, and how the same group defines itself.¹¹³

This *emic* point of view is important, given that the self-definition is usually formulated not only to emphasize the features in common within the same group and to see it as a unity, but mostly to set it apart and mark it as different from another group, so to create an 'us versus them (the other)' dialectic. This means not only that a determined group sees itself as a unity and as different from another one, but also that the same 'others' have to recognize and acknowledge this difference. Hence, a dialogue between groups and a system of inclusion/exclusion in and from them must take place.¹¹⁴

This system means also limited access to the resources available only to the group, which can be considered exclusion when the dominant group applies it against the dominated group, and usurpation when the dominated group manages to apply it against the dominant group. Limited access and selections can start because of external changes in the groups(s), such as mi-

106 Derks and Roymans 2009, 6; Stek 2014, 38, 2013, 347.

107 Derks and Roymans 2009, 6; Stek 2014, 38, 2013, 347.

108 As discussed in: Bader 2012a; Bader 2017; Jones 2008.

109 Derks and Roymans 2009, 3; Smith 2014, 195.

110 As shown in: Bader 2012a; Bader 2017.

111 As discussed in depth in: Bader 2012a.

112 Hall 2000, 17–19; Siepkas 2014, 70; Smith 2003, 19; Stek 2013, 350; Watson 1995, 688–90.

113 Derks and Roymans 2009, 4; Jones 1997, 56–59; Kemp 2006, 42–46; Knapp 2014, 36; Liszka 2012a, 51–52; Lucy 2005, 98–100; Smith 2003, 19–20; Smith 2007, 230–31.

114 Barth 1969, 14–16; Derks and Roymans 2009, 1; Dever 2007, 57; Emberling 1997, 306–8; Hall 2000, 26–27; Jenkins 2008, 58–64, 82–83; Jones 1997, 60–63; Jones 2008, 326–27; Kemp 2006, 20–25; Knapp 2014, 35–36; Liszka 2012a, 52–53; Lucy 2005, 98–101; McNerney 2014, 3; Siepkas 2014, 71–72; Smith 2003, 4–9, 19–23; Smith 2007, 218–21; Smith 2014, 194–95; Voss 2015, 14, 26–27.

gration influxes in a determined territory, or endogenous changes, born from phenomena within the group itself.¹¹⁵ It derives that a group emphasizes its ethnicity and its identity and focuses on inter-group relations only when it feels threatened and unifies against a danger, so that this emphasis is more common between dominated and excluded groups.¹¹⁶

In general, ethnic groups do not possess static and fix boundaries, but the boundaries are usually flexible and are often crossed. Persons, objects, and ideas from other groups can be accepted in a group through special procedures, such as marriage.¹¹⁷ Thus, a part of objects and ideas crosses boundaries of ethnic groups and is used, or at least known, by more populations, and can or cannot carry ethnic significance; on the contrary, another part is used as actual ethnic marker.¹¹⁸ This display of ethnicity, and the mechanisms of inclusion/exclusion to which it is connected, is particularly active in cities and regions where different ethnic groups meet and interact.¹¹⁹

Lastly, it should be taken into consideration that ethnic borders do not coincide with our concept of national borders. In ancient times national borders were more permeable than nowadays and could be crossed with ease, as shown by written documents.¹²⁰ Furthermore, the concept of Egyptian nationality is a modern one, created in the nineteenth century.¹²¹ In ancient Egypt, a foreigner who came to Egypt was considered Egyptian once he/she had adopted what was regarded as the set of Egyptian traditions and fulfilled an established role in Egyptian society, which usually happened in a short span of time.¹²² Therefore, the presence of foreigner groups and multicultural contacts in Egypt is not limited to the people from the Levant and the eastern Mediterranean living in Lower and Middle Egypt during the Middle Kingdom and the Second Intermediate Period.¹²³

115 Hall 2000, 26–27; Smith 2014, 194–95.

116 Hall 2000, 31; Smith 2014, 194–95.

117 Barth 1969, 9–11; Dever 2007, 52; Hall 2000, 28–29; Jones 1997, 15–39; Liszka 2012a, 66; Lucy 2005, 88, 97–98, 103; Reger 2014, 120–21; Schneider 2010, 152; Smith 2003, 1–2, 9, 204; Smith 2007, 218–19, 231–33; Stek 2013, 348–49.

118 Barth 1969, 9–15; Jones 1997, 96; Knapp 2014, 37; Siepkas 2014, 72; Smith 2003, 2; Smith 2007, 220–21; Smith 2014, 208–9; Voss 2015, 26.

119 Barth 1969, 19–21; Insoll 2007, 4; Jones 1997, 96; Reger 2014, 112–16; Schneider 2010, 146–47; Smith 2003, 6; Smith 2007, 220–21; Voss 2015, 26.

120 Kemp 2006; Liszka 2012a; Schneider 2010, 147–48; Smith 2003.

121 Moers 2015.

122 Kemp 2006; Liszka 2012a; Schneider 2010, 147–48; Smith 2003.

123 Bietak 1996, 36–40; Bietak 2002, 36; Forstner-Müller 2003; Forstner-Müller 2010, 134; V. Müller 2002, 271–75.

Ethnicity and imperialism

Ethnicities can also be superimposed by one group onto another, creating ethnic stereotypes. This process means both associating people that spontaneously would have not considered themselves as elements of the same group and including in the ethnicity of these people markers that would have not spontaneously been used. Through time and interaction with the imposing ethnic group, and to facilitate relations with it and obtain more favours from it, the imposed ethnic group would adjust itself to the imposed ethnic stereotypes, resorting to a situational ethnicity.¹²⁴ This kind of ethnicity is mostly found within the context of colonialism and empires. There are a few main concepts that have been used when studying situational ethnicity, and in general when analysing ethnicity in empires, such as assimilation, acculturation, creolisation, and hybridity.

Acculturation and assimilation are similar concepts, and represent two stages of the same process in which a group, usually a dominated one, acquires and uses traits from another one, usually the dominant one, until it appropriates them completely and changes its own culture. Both acculturation and assimilation are based on the principle of emulation, according to which the dominated group acquires the culture of the dominated group by emulating its features, or a part of them, sometimes for practical reasons and sometimes because the culture of the dominant group seems better.¹²⁵ Acculturation represents the stage in which the group simply uses these traits, but still perceives itself different from the group from which the traits derive.¹²⁶ Assimilation is the stage in which the group not only uses these traits, but switches its own traits for the new ones and does not perceive itself different from the group from which the traits derive.¹²⁷

Hybridity and creolisation concern another type of process, by which a group, usually a dominated one, receives and mixes traits from another group, usually the dominant one, with its own cultural traits. The main difference is that hybridity does not take into count the imbalance of power between the dominant and the dominated group and the real motives behind the adoption or the rejection by the dominated group of particular cultural traits of the dominant group. It does not consider the resulting hybrid culture

124 Hall 2000, 17–19; Reger 2014, 121–22; Smith 2003, 20–21; Stek 2013, 350; Voss 2015, 13–14; Watson 1995, 688–90.

125 Millett 1990a, 37–38; Webster 2001, 216.

126 Berry 2003, 17–19; Hall 2000, 30–31; Jones 1997, 50–51; Liszka 2012a, 103–10; Schneider 2010, 144–46; Smith 2003, 2, 19.

127 Hall 2000, 30–31; Jones 1997, 54–55; Kemp 2006, 33–42; Liszka 2012a, 110–11; Schneider 2010, 144–46; Smith 2003, 22–24.

as a culture of its own.¹²⁸ However, hybridity carries problematic assumptions, such as the purity of the cultures from which it derives, or ‘parents’, and that the hybrid culture inherit characteristics from the ‘parents’, like in a genetic transmission, which define its identity and success.¹²⁹ On the contrary, the concept of creolisation, also called ethnogenesis, also considers the reasons and negotiations of power behind the selection of particular cultural traits of the dominated group, focusing especially on the rejected ones, and regards the resulting creole culture as a culture of its own born from specific local circumstances.¹³⁰ Creolisation in particular is based on the concept of resistant adaptation, namely the dominated group adopts a part of its traits from the dominant group, but it adapts them to its own culture and social conditions, while at the same time refusing other cultural traits of the dominant group.¹³¹

From the archaeological point of view, following one or the other concept also means having different ways of interpreting material culture. If using the concepts of acculturation, assimilation, and emulation, one would have a more monolithic vision of ethnicity and ethnic groups, and would expect that the distribution of specific objects in geographical areas can show the presence of a particular dominant or dominated group there, which is a reasoning that, as previously shown, is not correct.¹³² If using the concepts of hybridity and creolisation,¹³³ ethnicity is considered more differentiated and the objects are analysed not as signs of the presence of a particular dominant or dominated group, but as part of a new culture and as signs of the negotiation and dialogue processes between the two groups.¹³⁴

The case of Romanization

Situational ethnicity is found also in the phenomenon of Romanization.¹³⁵ This is a useful case-study to examine for this thesis, because it concerns how local groups interact with a newly imposed power, as it could be also the Hyksos Dynasty in northern and middle Egypt, and how we can better analyse the relations that get established.

128 Knapp 2014, 41–43; Reger 2014, 112–15; Webster 2001, 211–12.

129 Reger 2014, 113–115.

130 Webster 2001, 217–19; Voss 2015, 9–37.

131 Webster 2001, 218.

132 Jones 1997, 109–25; Voss 2015, 35.

133 On some problems inherent in using the term ‘hybridity’, see: Bader 2017, 14–15; Stockhammer 2013.

134 Webster 2001, 219–23. An example of hybridity as defined here is the material culture developing during the Second Intermediate Period in Tell el-Dab’a and the Eastern Delta: Bader 2012a, 218; Bader 2017, 14–15.

135 Bader 2017, 17–18; Jones 1997, 29–39, 129–35; Liszka 2012a, 54–55; Lucy 2005, 103–5, 108.

Acculturation through emulation is the main concept used by Ramsay MacMullen¹³⁶ in his study of the entire Roman empire during the time of Augustus. Though the wide geographical range, the focus on the non-elites and the use of archaeological material are appreciable, this study is very much embedded in the division between a monolithic Roman culture, exported mostly through conquest and migration of Romans and Italics, and a monolithic native culture, with this latter presented as a passive receiver of the former.

Another theory of acculturation, which is based on progressive emulation and partially differs from the one proposed by MacMullen, has been suggested by Martin Millett,¹³⁷ in his analysis of the Roman empire in Britain. According to him, native elites who are given governing power by the Romans emulate Roman material culture, to reinforce their social position. This emulation, then, works its way down the social scale in a progressive emulation. In summary, this theory makes Romanization a process participated in by the native population, which then plays a more active role and is not just a passive receiver of Roman culture.¹³⁸ It is evident that this approach is focused very much on the elites and on the division between a dominant Roman culture and a subordinate native culture, which can react in different ways, by accepting specific Roman cultural features, while rejecting or reworking other ones.

A more nuanced approach is found in Louise Revell's analysis of Britain and Spain during the Roman period.¹³⁹ She has examined architecture, use of public spaces, imperial cult and authority, and the participation in religious rituals, to show how Roman culture and identity had multiple forms and was mostly an experience lived in different ways by different peoples. While having the advantage of presenting the Roman culture as more complex and less monolithic than in the previous studies, it still strongly emphasizes a division between Romans and natives and focuses mostly on the elites, still leaving the other social classes as passive recipients of elite culture.

The dichotomy between Roman dominators and native subjected peoples is found also in the analysis of Britain during the Roman period by David Mattingly,¹⁴⁰ who has stressed even more the division between Romans and natives, with the first ones trying to impose their culture and the latter reacting in different ways. Despite having the merits of starting from the lower social classes and of including material culture, his analysis is still based on the concepts of imperialism and colonialism, focusing on the conquering and dominating aspect of the Roman occupation, and exploitation, of Britain.

136 MacMullen 2000.

137 Millett 1990a, 1990b.

138 Millett 1990a, 37–38; Millett 1990b, 68–69.

139 Revell 2009.

140 Mattingly 2010.

A diversion from this approach is used by Greg Woolf,¹⁴¹ who, despite maintaining the separation between a 'Roman' and a 'native' culture, has demonstrated how both are not monolithic and absolute, but relative categories. Focusing his analysis on Gaul during the Roman period, Woolf has first shown how a few of the native elites actively created a new social order by including, by their own volition, Roman ideas in their own system, partially also to get the favour of Rome, while others consciously rejected it.¹⁴² From this model, which seemingly was too attached to the point of view of the elites, Woolf followed the example of Mattingly and revised his theory by applying an approach from the lower levels of Gallic society, which also included the examination of material culture.¹⁴³ He concluded that Roman and native ethnicities were fluid and permeable aspects of the culture and of the identity of a person or a society, which could change with time and occasion.

Jane Webster¹⁴⁴ has proposed a different approach, again starting from the non-elite levels of society and using material culture, however, still embedded in the separation between Romans and natives. Starting from America and the Caribbean as an example for methodological purposes, and then examining Roman-Celtic iconography, she has suggested the concepts of creole material culture and resistant adaptation for the cultures of the Roman provinces. According to these concepts, both the Roman and the native cultures are mixed and reused by the native populations in their own way, but in a context of an imbalance of power. This means that not all levels of society had the same means and the same aims for reusing Roman cultural traits. Thus, different outcomes originated, each with its own characteristics and goals.

Nowadays, scholars studying Roman archaeology and the archaeology of Roman provinces have tried to surpass the dichotomy Roman-native, by focusing on the study of the objects themselves, their archaeological context and possible use,¹⁴⁵ and the economic and social processes so attested, without attaching any particular ethnic connotation to them. For example, Tesse Stek,¹⁴⁶ in his examination of the Romanization of Italy, has demonstrated how Roman culture was actually reusing symbols already known elsewhere in the Mediterranean and Greek culture, and how different economic and social processes, other than acculturation and besides simple military conquest, were at play and have to be taken into consideration.¹⁴⁷

141 Woolf 1997; Woolf 1998.

142 Woolf 1997.

143 Woolf 1998.

144 Webster 2001.

145 Pelgrom and Stek 2015, 11; Stek 2014, 31–36.

146 Stek 2013; Stek 2014; Stek 2017.

147 Stek 2014, 36–39; Stek 2013, 341–50; Stek 2017.

Lastly, new perspectives on the Romanization debate have been given by recent studies using globalization concepts, taken from modern social sciences.¹⁴⁸ These studies focus on the connections within the Roman world on a larger geographical scale and on longer time spans. Furthermore, they use conflict-based models, in which local elements create new societies and new power structures by competing and cooperating in a larger system that connects them. From this, it derives that these studies stress networks of local elements and on how they are linked to each other. Finally, this means that the origin of the objects or their use as ethnic markers, thus talking about Roman and native material cultures, is not relevant.¹⁴⁹

In the end, what matters is how objects were used and how they connected people, beyond specific meanings of ethnicity and identity that they could acquire. This has been called the “material turn” in the Romanization debate, because it focuses on the objects themselves and does not try to give preconceived labels to the peoples using them.¹⁵⁰

ETHNICITY IN THE SECOND INTERMEDIATE PERIOD?

After what has been discussed so far in this chapter it seems that, like in the debate about Romanization, there is the risk of focusing too much on an opposition Egyptian/non-Egyptian, where non-Egyptian includes Asiatics, Nubians and Cypriot, and on a simplistic process of acculturation and assimilation. Furthermore, there is the risk of considering the dominant Hyksos and the groups from the Levant as passively assimilating or reusing the culture of the dominated Egyptians. Though undoubtedly there were objects new to Egyptian traditions that were introduced by people of Asiatic, Nubian, or Mediterranean descent, their use in Egypt did not necessarily carry any ethnic meaning. As shown, the regionalization apparent in the material culture and the import of objects, or their imitations, also had other motives, like economic and political reasons.

Despite not being an empire at the time, Egypt, like Rome, was included in a connected world, as it has been shown and as it appears also from Egyptian objects found in the Levant and Mediterranean, such as the vessels with the cartouche of Khayan found on Crete and in Anatolia,¹⁵¹ or the stone vessels from Egypt found in the royal tombs of Qatna, whose dating covers a period

148 Hingley 2005; Pitts and Versluys 2015; Stek 2014.

149 Hingley 2005; Hingley 2014; Hodos 2014; Pieterse 2014.

150 Stek 2014; Versluys 2014.

151 Mellink 1995.

from the MB IIa to the LB IIa, in other words from the Late Middle Kingdom to the half of the New Kingdom.¹⁵²

Therefore, the present work considers the assemblages of objects detected through network analysis not significant of specific cultural groups, but of entire networking systems, of smaller or larger scale, which include political, religious, social, and cultural groups as well. The focus of the present work is on places and, mainly, on objects, how they circulated and which systems they signify, and how objects introduced from outside Egypt took part in this network. Rather than trying to disentangle ethnicities, I will emphasize how material culture was used at a local level and how places and objects may be connected to each other.

152 Ahrens 2007; Ahrens and Mynářová 2011.

NETWORK ANALYSIS

This chapter elaborates on network analysis, which is the methodology used in the present work. What is its theoretical background? How is it conducted? Considering that, in the present work, this methodology is applied to archaeological material, more questions arise: how is network analysis applicable in archaeological research? Which issues are connected to it and how can they be tackled? In this chapter, the basic theory and terminology of network analysis, especially the elements most relevant to the present work, are discussed, as well its application to archaeological research. The main issues present in this methodology and how researchers have dealt with them are also addressed. Lastly, the use of network analysis in the present work is illustrated, by detailing how the material is going to be analysed in the present work.

WHAT IS NETWORK ANALYSIS?

Network analysis started from sociometry, which studies social atoms, namely the individual and his/her social, economic, or cultural ties. It also studies how the social atoms link into groups and how these groups connect into a society.¹ Network analysis is based on the belief that interpersonal relations, as well as relations between organizations and countries, are important because they are means of transmission of behaviours, information and goods.² As a consequence, in order to understand the role and behaviour of entities, or actors, it is important to study how they interact and the relations that they establish in the network to which they belong: this is the main goal of network analysis.³ An entity, or actor, is any person, organization, or land participating in a relation.⁴

1 De Nooy, Mrvar, and Batagelj 2005, 3; Scott 2012.

2 De Nooy, Mrvar, and Batagelj 2005, 3; Scott 2017, 2–3.

3 Brughmans, Isaksen, and Earl 2012, 360; Collar 2014, 99; Collar et al. 2015, 6; De Nooy, Mrvar, and Batagelj 2005, 5; Mills, Clark, et al. 2013, 5875; Sindbæk 2013, 72–73.

4 De Nooy, Mrvar, and Batagelj 2005, 5.

Furthermore, in the same way that to understand an entity or actor it is necessary to study the universe of its connections, also the reverse is true, because the actors and their actions define each other.⁵ Thus, the interpretation of different processes and phenomena is based on the relations that entities establish and on the role that they have.⁶ This is an exploratory approach, which, based on the belief that a pattern detectable in a network is significant to the actors of the networks and therefore to the researcher, means that the researcher investigates a network for meaningful patterns, instead of using the network to test a specific hypothesis.⁷

This way of proceeding has the advantage that, apart from the definition of which entities are being analysed and what are the elements linking them, other analytical constructs, such as the definition of a core and a periphery, are avoided.⁸ Moreover, the analysis can be conducted on multiple scales, which can be synthetically visualized in a graph.⁹ It is important though, to clearly define the boundaries of the network, namely what is the extent of the entities or actors analysed, because this can affect the outcome of the analysis.¹⁰ In archaeology, for example, the entities are often sites, contexts such as tombs or particular parts of the sites, or objects, but it is up to the scholar to define the range of sites or contexts or objects analysed.¹¹

NETWORK ANALYSIS IN ARCHAEOLOGY

Network analysis has been used in archaeology to study relations between persons, places, objects, or even decorative motifs. It has shed new light on old data and has given new potential to archaeological research, by giving the possibility to focus on the human relations and on the social groupings witnessed by the objects,¹² because these relations are seen as means that allow material and non-material resources to flow between groups.¹³ In an archaeological two-mode network, where two groups of entities are examined, one group is often constituted by the contexts analysed, while the other group is often formed by their attributes, mostly objects such as pottery; this means

5 Brughmans 2013, 632–33; Brughmans, Isaksen, and Earl 2012, 360.

6 Brughmans 2013, 632–33; Golitko and Feinman 2015, 212–13; Mills, Clark, et al. 2013, 5875.

7 De Nooy, Mrvar, and Batagelj 2005, 5.

8 Knappett 2013, 4.

9 Golitko and Feinman 2015, 212–13; Knappett 2013, 4–6.

10 De Nooy, Mrvar, and Batagelj 2005, 6; Scott 2017, 46–48.

11 As shown in: Brughmans 2010; Östborn and Gerding 2014.

12 Collar et al. 2015, 6; Mills, Roberts Jr., et al. 2013, 181–82; Östborn and Gerding 2014, 76.

13 Brughmans 2013, 632–33.

that the contexts are linked to their attributes. As an example, in Figure 1 in Chapter 7, each site is linked to the types of beads excavated there. In an archaeological one-mode network, the entities can be either the contexts or the attributes; this means that each context is linked to another context if they share a particular attribute, or that each attribute is linked to another attribute if they are found in the same context.¹⁴ As an example, in Figure 2 in Chapter 7 each site is linked to the other sites with which it has types of beads in common.

However, when using network analysis for archaeological research it is important to distinguish it from social network analysis.¹⁵ While the latter implies studying relations between persons without the intermediation of the objects used by them, in archaeology the focus is on the objects that people from the past used and have left. Though these objects can be used also to reconstruct social relations, they show these social relations in an indirect way and their study cannot be limited to that.¹⁶

In other words, in social network analysis the studies start from the relations detectable in a group and then examine its effect, while in archaeology the starting point is the effect of the relations, namely the objects exchanged. From these objects, the connections between entities that made the exchange possible are reconstructed. Because of this, in archaeology it is more correct to use the definition network synthesis instead of network analysis.¹⁷ Moreover, in archaeological research, the connections detected through the objects often take into consideration the geographical location of the elements studied, so that geography and the use of a software for geographical information system are an integral part of the analysis.¹⁸

Another difference concerns the fact that, when used in archaeology, network analysis has fewer and less complex equations than when used in other fields like sociology or physics. There are, though, other elements making network analysis difficult in archaeology, first of all the nature of the data set.¹⁹ In archaeology, the objects are often the main constituents of the data set, but the links connecting them are absent, like having a black box where the elements of the circuit are present but not connected.²⁰ For example, in the present research, the data about the objects and the sites are available, but it is not clear how the sites were connected or how the objects arrived at the sites.

14 Brughmans 2010; Östborn and Gerding 2014, 76.

15 Brughmans 2010, 282.

16 Brughmans 2010, 282; Knappett 2013, 7–8.

17 For the discussion about this point: Sindbæk 2013, 76.

18 Mills, Roberts Jr., et al. 2013, 182.

19 For a discussion about this point: Knappett 2013, 7–8.

20 Sindbæk 2013, 72.

Therefore, the present work uses only undirected graphs, where directions from one site to another are not considered, as explained later.

In addition, the nature of the data collected in archaeology is often incomplete and subjected to disturbing factors, which make the array of data uneven. These factors include the extent and methods with which sites have been excavated, as well as the methods followed to collect, study, and publish the material.²¹ This produces the so-called archaeological bias, which means that sites that happen to have been more extensively excavated, or more extensively or more accurately published, could appear more important and be over-estimated in the analysis because they proved more data, while sites less excavated or published could appear less important and be under-estimated in the analysis because they provide fewer data.²² To reduce the risk of archaeological bias, only the presence/absence of objects at a site is taken into consideration, without taking into account the amount of contexts or the abundance, as explained later.

Therefore, it should be kept in mind that the data examined are not complete, but a sample, which could be unrepresentative, and in its turn this could affect the analysis and its results.²³ This makes it necessary to recur to statistical tests, mathematical models, and the setting of thresholds, namely minimum values that the nodes need to have to stay in the network, as decided by the researcher, in order to understand the strength and value of the data and reconstruct a realistic picture.²⁴ Examples of this are particularly found in Brughmans' research on the distribution of Roman table wares in the Eastern Mediterranean,²⁵ and in a research conducted on pre-Hispanic U.S. Southwest.²⁶

Furthermore, the dataset in archaeological research has a complex nature. In other words, the entities have many attributes and can connect to each other in different ways on the basis of the attributes examined.²⁷ For example, in Östborn and Gerding's analysis of the fired bricks in pre-Hellenistic times, the bricks registered in the data set could be related on the basis of their contexts of use, or of the marks found on them, or of their shape.²⁸ In the present work, the links between the sites examined have been created based on types, defined as objects of specific shape and specific material.

21 Knappett 2013, 7–8.

22 For a discussion about this point: Knappett 2013, 7–8.

23 Östborn and Gerding 2014, 81–83; Peeples and Roberts Jr. 2013, 3002.

24 Brughmans 2013; Brughmans, Isaksen, and Earl 2012; Knappett 2013; Östborn and Gerding 2014, 81–83; Peeples and Roberts Jr. 2013, 3002.

25 Brughmans 2010.

26 Peeples and Roberts Jr. 2013.

27 Brughmans 2010, 285; Sindbæk 2013, 73.

28 Östborn and Gerding 2015.

It should also be added that in archaeology there is a background knowledge that is relevant to understand the material, such as the context and position where it was found, the assemblage, or group of objects, of which it was part, and its use. This complexity means that the attributes to insert in a matrix are more or less arbitrarily chosen by each scholar.²⁹ This shows also that it is difficult to render in a matrix and in quantitative terms all the aspects connected to each entity and each attribute.³⁰ That is why even archaeologists using network analysis caution against expecting statistical exactness and against over-interpreting the network graphs.³¹

To tackle this issue, it is useful to consider the difference between visualization and representation. While the former is the visualization of the data as a network graph, the latter is the process that precedes it and that includes the choices and parameters set by the scholar to establish what entities need to be represented and what attributes need to be taken into account.³²

Lastly, another problem when using network analysis in archaeology concerns visualizing the diachronic aspect of historical processes. The archaeological record allows us to have a glimpse at specific moments of these processes,³³ like looking at single frames from different scenes of a film. Can network analysis be used to reconstruct the processes, or, to use again the metaphor, to reconstruct entire scenes or even the entire film from the single frames? From research conducted so far it seems that it is feasible. For example, studying the co-presence of specific objects, namely their presence in the same sites at the same time, over different periods can inform about how the distribution of these objects developed over time, helping to further understand the processes leading to this distribution, as demonstrated for example in Brughmans' research.³⁴ Moreover, examining how the position and role of entities in a network eventually changes through time can show the underlying processes.³⁵ In the present work, the diachronic aspect has been achieved by dividing the sites in the three main chronological phases examined (see Chapter 2): Late Middle Kingdom, Early Second Intermediate Period, Late Second Intermediate Period.

On the same topic, Östborn and Gerding³⁶ have used the concept of 'complex evolution', according to which network analysis is useful in reconstructing spatial-temporal processes because it compares pairs of contexts and creates

29 Collar et al. 2015, 12.

30 Sindbæk 2013, 77.

31 Östborn and Gerding 2014, 83.

32 Collar et al. 2015, 12.

33 Brughmans 2010, 283.

34 Brughmans 2010, 288.

35 Golitko and Feinman 2015, 217; Mills, Roberts Jr., et al. 2013, 182.

36 Östborn and Gerding 2014, 80–81.

branches like the ones used in biological evolution, with one main difference: in biological evolution a branch can give origins to further branches, but new branches can never recombine to form a new one, creating a tree-shaped diagram. In cultural developments, on the contrary, traits can recombine to form a new one, so that the final diagram can contain also loops.

HOW TO BUILD NETWORKS

The starting points of network analysis are the dataset and the matrix. In the dataset, all the features relating to each entity are reported. These features can be attributes, namely features intrinsic to the entities, or relational data, namely elements such as organizations or events in which the entities participate, or 'ideational' data, namely elements such as opinions and motives shared by the entities.³⁷ Furthermore, a dataset can have a hierarchical or flat structure. In the first case, the value of a given feature of an entity determines the value of another feature of the same entity, while in the second case the features vary independently.³⁸

The matrix is a table where each row and each column correspond to an entity, while the intersection of a row and a column is called a cell.³⁹ Each cell reports the number of connections, or similarities, associating the entity of that row with the entity of that column, namely how many similar features the entity of that row shares with the entity of that column.⁴⁰ If the entities of the rows and the entities of the columns are the same, then there is only one group of entities and the network is called one-mode, because it examines how each entity is connected to the others in the same group.⁴¹ This type of matrix is also called an adjacency matrix, because it shows clearly which entities are neighbours or adjacent, namely connected, in the network.⁴² If the entities of the rows are different from the entities of the columns, then there are two groups of entities and the network is called bimodal (or bipartite or two-mode), because it examines how the entities of one group are linked to the entities of another group.⁴³ This type of matrix is also known as incidence matrix.⁴⁴

37 Scott 2017, 3–6.

38 Östborn and Gerding 2014, 76.

39 De Nooy, Mrvar, and Batagelj 2005, 260.

40 Scott 2017, 59–60.

41 Brughmans 2013, 626–28; De Nooy, Mrvar, and Batagelj 2005, 103; Östborn and Gerding 2014, 76; Scott 2017, 61–62.

42 De Nooy, Mrvar, and Batagelj 2005, 260; Scott 2017, 62.

43 Brughmans 2013, 626–28; De Nooy, Mrvar, and Batagelj 2005, 103; Easley and Kleinberg 2010, 94; Östborn and Gerding 2014, 76; Scott 2017, 59–63.

44 De Nooy, Mrvar, and Batagelj 2005, 261; Scott 2017, 62–63.

An alternative to the matrix is the edge list, which reports which entities share a connection. In a few words, it is a table with two columns where each row reports a specific entity, in the first column, and the entity that is contact with it, in the second column; a further column can also report the strength of the contacts, namely the number of similarities or connection that the entities of each row share.⁴⁵ From the matrix, or from the edge list, software programs specialized in network analysis, such as ORA, VISON, Gephi, UCInet, NodeXL, and Pajek produce a graph,⁴⁶ which visualizes and specifies the relations among the entities through dots and through the lines connecting them.⁴⁷ Because of the fact that network analysis uses graphs to visualize and analyse the network, it also uses terminology from graph analysis.⁴⁸ Thus, like in graph analysis, the dots are called vertices or nodes and correspond to the entities chosen for the analysis, while the lines or links connecting them are called edges and correspond to the connections or similarities between the entities.⁴⁹ The nodes are called adjacent, or neighbours, if they share an edge.⁵⁰ Thus, a pair of nodes and the link between them form a dyad.⁵¹ For example, in Figure 3 in Chapter 7, Lisht and Harageh are a dyad, because they have types of beads in common, which create the link between them.

Networks can be undirected or directed. Undirected networks are the ones where the relation between each pair of entities is symmetrical, that is to say it is always reciprocal and functions both ways, implying that the entities share the same number of connections or similarities.⁵² All the networks produced in the present work are undirected, as for example in Figure 3 in Chapter 7. On the contrary, in directed networks the relations are not always symmetrical and they involve a flow in a pair of entities, which start from a sending entity, or sender, and ends at a receiving entity, or a receiver.⁵³ In a graph, a link is called tie in undirected networks and arc in directed networks.⁵⁴ An arc is

45 Cline and Cline 2015, 21–24.

46 These programs are mentioned, for example, in: Brughmans 2013, 624; Cline and Cline 2015, 21; Dulíková and Mařík 2017, 63–64; Scott 2017, 69–71.

47 Easley and Kleinberg 2010, 23.

48 Brughmans 2013, 623–24; Scott 2012; Scott 2017, 69.

49 Brughmans 2010, 277; Brughmans 2013, 626–28; Cline and Cline 2015, 26; De Nooy, Mrvar, and Batagelj 2005, 6; Easley and Kleinberg 2010, 23; Östborn and Gerding 2014, 76; Scott 2017, 74–76.

50 De Nooy, Mrvar, and Batagelj 2005, 64; Easley and Kleinberg 2010, 23; Scott 2017, 78.

51 De Nooy, Mrvar, and Batagelj 2005, 205–6.

52 Brughmans 2013, 627; Collar et al. 2015, 14; Coward 2013, 248; De Nooy, Mrvar, and Batagelj 2005, 7; Easley and Kleinberg 2010, 23; Peeples and Roberts Jr. 2013, 3002; Scott 2017, 76–78.

53 Brughmans 2013, 627; De Nooy, Mrvar, and Batagelj 2005, 7; Easley and Kleinberg 2010, 23.

54 De Nooy, Mrvar, and Batagelj 2005, 6–7; Peeples and Roberts Jr. 2013, 3002.

represented as an arrow, with the sender node at its tail and the receiver node at its head.⁵⁵ A special case is the loops, which are circular edge that connect a vertex to itself.⁵⁶

In a graph with a directed network it is useful to examine not dyads, but triads, namely groups of three nodes and their links: these triads form the shape of a triangle and the edges connecting them can assume several possible combinations.⁵⁷ When the nodes of a triad are all connected to each other, it becomes a triadic closure,⁵⁸ to which also the clustering coefficient is connected. The clustering coefficient is the measure based on the probability that two entities are also linked to each other if they are both linked to a third entity.⁵⁹ Its calculation is based on the quantity of triads in the network,⁶⁰ and is given by the proportion between the neighbours of the examined node and the maximum number of edges possible between these neighbours.⁶¹

A network can be also binary or weighted. In a binary network the connections between entities are defined as either present (they have a value of 1) or absent (they have a value of 0), without considering the number of shared similarities that form their connections or links.⁶² All the two-mode networks produced in the present work are binary, as e.g. Figure 1 in Chapter 7. There, all the edges between the sites and the types of beads have the same size, because they all have equal value (1); the number of contexts where each type of bead is found, or how many beads, is not taken into account, to diminish the risk of archaeological bias. In a weighted network, the connections or links are differentiated on the basis of how many similarities form each link.⁶³ A special case is the weight of line multiplicities, which are the lines created when the multiple lines of a bimodal graph are substituted by the single lines of a one-mode graph. In other words, the multiple lines that in the two-mode graph connect each pair of nodes of the same set through the nodes of the other set are replaced in a one-mode graph by a single line, whose value correspond to the number of those multiple lines.⁶⁴ This is the case with the first kind of one-mode networks produced in the present work, where the links between the sites are the sum of how many links they have to the same types of

55 De Nooy, Mrvar, and Batagelj 2005, 7.

56 De Nooy, Mrvar, and Batagelj 2005, 6–7.

57 De Nooy, Mrvar, and Batagelj 2005, 206–7; Scott 2017, 121.

58 Easley and Kleinberg 2010, 48–49.

59 Easley and Kleinberg 2010, 49; Newman 2001a; Newman 2010, 262–66.

60 Cline and Cline 2015, 36; Newman 2001a.

61 Brughmans 2013, 634; Newman 2001a; Newman 2010, 262–66.

62 Peeples and Roberts Jr. 2013, 3002; Peeples et al. 2016, 65–66; Scott 2017, 76–78.

63 Collar et al. 2015, 14; Newman 2004; Peeples and Roberts Jr. 2013, 3003; Peeples et al. 2016, 65–66.

64 De Nooy, Mrvar, and Batagelj 2005, 105.

objects in the bimodal graph. For example, in Figures 29-32 in Chapter 8, the size of the link between Edfu and Harageh is given by the sum of the types of stone vessels to which they are both linked in Figure 28 in the same chapter (Types 1, 6, 7, 23, 27, 30). The line multiplicity is also at the base of m-slices, which is a group of nodes whose edges have at least a determined value, as decided by the researcher: for example, an m-slice with a value of 3 includes all the nodes who have an edge of value 3 or higher.⁶⁵

In archaeological research, binary networks can be founded on the presence/absence of particular types of objects or features, while weighted networks can be based, depending on the research questions and on the available data, on the number of sites or contexts in which a particular object or feature is retrieved, or on abundance, namely how many specimens are found in each context.⁶⁶ In archaeology, weighted networks can generally be preferable because they are more likely to give a nuanced picture that captures the complexity of the examined process.⁶⁷

NETWORK ANALYSIS: A STEP FURTHER

The basic idea, common to all the fields where network analysis is applied, is that things, be that information, goods, technology, or anything else, travel across entities or nodes.⁶⁸ In detail, in the network visualized in a graph, the path is the sequence of edges followed to travel from a node to another, that is to say the itinerary used to travel from one node to another.⁶⁹ Alternatively, a path can also be defined as a sequence of nodes in which each pair is connected by an edge.⁷⁰ The length of a path is the number of steps, namely the sequence of edges, between two nodes and indicates also the strength of the relations between these nodes.⁷¹ For example, in Figures 29-32 in Chapter 8, the connection between Qau el-Kebir and Ballas, created through types of stone vessels in common, is indirect and possible through two paths. One path goes from Qau el Kebir first to Matmar, then to Esna, and then to Ballas. The second path goes from Qau el Kebir directly to Esna, and then to Ballas. It is visible that the problem here is that no direct links, hence no types of stone vessels in common, are between Matmar and Ballas.

65 De Nooy, Mrvar, and Batagelj 2005, 109–10; Scott 2017, 125–26.

66 Peeples et al. 2016, 65–66.

67 Peeples and Roberts Jr. 2013.

68 Easley and Kleinberg 2010, 26.

69 De Nooy, Mrvar, and Batagelj 2005, 67; Scott 2017, 79–80.

70 Easley and Kleinberg 2010, 26.

71 Brughmans 2010, 289; De Nooy, Mrvar, and Batagelj 2005, 14; Easley and Kleinberg 2010, 32–33; Peeples and Roberts Jr. 2013, 3003.

The shortest path, that is to say the quickest itinerary or the quickest sequence of edges between pair of nodes, is called geodesic.⁷² Going back to the previous example, in Figures 29-32 in Chapter 8, the geodesic between Qau el-Kebir and Ballas is the one that passes directly through Esna, skipping Matmar. To this is connected the average path length or average geodesic distance, which is the length of the average path between the entities in a network. This measure is useful because it helps understand how much connected a network is and how efficiently its entities communicate.⁷³ Furthermore, in a network it is possible to calculate the maximum geodesic distance, or diameter of the network, which is the length of the shortest path between the two entities that are the farthest from each other in that network.⁷⁴

The network represented in a graph is said to be connected if for each pair of nodes there is a path connecting them.⁷⁵ Furthermore, in a graph also connected components can be distinguished. A connected component is a group of nodes where each node has a path to the other nodes of the group, but not to a larger group of nodes.⁷⁶ This is useful to analyse the internal structure of a network.

In graphs with directed networks, a path and a semi-path are also distinguished. While in paths the direction of the arcs is taken into consideration, and the all the arcs have to point in the same direction, so that each node is at head of an arc and at the tail of another, this does not happen for the semi-path.⁷⁷ Hence, a group of nodes is said to be weakly connected if its connections are all made of semi-paths, while it is said to be strongly connected if its connections are all made of paths.⁷⁸

Moreover, in a graph with a weighted network, the strength of an edge, based on the quantity of similarities shared by the two nodes that it connects, can be indicated also by the thickness of the same edge.⁷⁹ This strength can also be visualized as a number near each edge.⁸⁰ To return to Figures 29-32 in Chapter 8, the thickness of the edges is given by how many types of stone vessels they have in common. Thus, the software programs for network analysis allow to adjust the thickness, or even the colour, of the edges on the basis

72 De Nooy, Mrvar, and Batagelj 2005, 126–27; Newman 2001b; Scott 2017, 79.

73 Cline and Cline 2015, 34; Newman 2010, 55–56.

74 Cline and Cline 2015, 34; De Nooy, Mrvar, and Batagelj 2005, 127; Newman 2010, 136–40.

75 Easley and Kleinberg 2010, 28–29.

76 Easley and Kleinberg 2010, 29–30.

77 De Nooy, Mrvar, and Batagelj 2005, 67; Scott 2017, 79–80.

78 De Nooy, Mrvar, and Batagelj 2005, 68.

79 Brughmans 2010, 291; Brughmans 2013, 626–28.

80 De Nooy, Mrvar, and Batagelj 2005, 7.

of the number of similarities forming the links and on how weak or strong they are.

The set of links and paths detected create different types of network. One of them is the so-called lattice network, where all entities are equally coupled to each other: this is rare in real life but can be used to model networks in which sites have relations only with their immediate neighbours. In these networks, the distance of the links is short, and all entities have the same importance, thus it is an egalitarian network where relations are short-distance and limited to immediate neighbours.⁸¹

Another possible type of network is the so-called small-world network, which is like the lattice network, but less egalitarian. It is formed by groups of entities densely linked at an intra-group level, but weakly linked at an inter-group level.⁸² This means that inside each group and on a short distance the entities are well connected, while on a long distance each group is connected to other groups only by a few bridging entities.⁸³

The features defining a small-world network are a short average geodesic distance and a high clustering coefficient.⁸⁴ This means that relations are mostly short-distance and that all the entities, regardless of the number of relations they establish, have a similar, though not equal, importance in the network.⁸⁵ Moreover, there is a redundancy of path, meaning that pairs of entities have more paths allowing them to reach each-other.⁸⁶ Lastly, small-world networks are especially susceptible to the setting of thresholds – in other words, to the setting of minimum values that the nodes are required to have to remain in the network – because a too low threshold can make the network look sensibly more connected than what it actually is, while a too high threshold can make it look too disconnected and only made of separate small groups.⁸⁷

The small-world network and its characteristic are related to what is known as small-world phenomenon, meaning that an entity can reach through a short path even entities far in the network, through common links.⁸⁸ In this context, an interesting role is covered by bridges and cut-vertices. A bridge is an edge and a cut-vertex is a node whose removal creates new, isolated groups

81 Östborn and Gerding 2015, 311–12.

82 Cline and Cline 2015, 32–37; Collar 2014, 99–100; Östborn and Gerding 2015, 311–12; Scott 2017, 160–61.

83 Brughmans 2010, 277; Collar 2014, 99–100; Östborn and Gerding 2015, 311–12; Sindbæk 2007b, 61.

84 Cline and Cline 2015, 34; Newman 2010, 55–56; Östborn and Gerding 2015, 311–12.

85 Östborn and Gerding 2015, 311–12.

86 Scott 2017, 160.

87 Scott 2017, 160–61.

88 Easley and Kleinberg 2010, 35–37.

in the network, thus increasing their number.⁸⁹ Therefore, a bridge is an entity that act as an intermediary between two groups, without being really part of any of them.⁹⁰

A special type of bridge is the so-called local bridge, which connects two entities that are not connected through any other entity.⁹¹ The neighbourhood overlap is useful to detect local bridges, because this measure is 0 for pure local bridges, so that the nearer this measure is to 0, the more probably the edge is a local bridge.⁹²

A further type of network is the so-called scale-free, where only a few entities are highly connected to the others, establishing many and strong links, while the remaining ones are peripheral; the relations can cover short or long distances.⁹³ This means that the highly connected entities are also the probable driving powers in the spreading of innovations, because they have the links to transmit it to the poorly-connected entities,⁹⁴ as explained by the power law distribution. The power law distribution can be detected by comparing the degree centrality – a mathematical algorithm which will be explained in detail later – of the nodes of a network. If the nodes follow a power law distribution, the network features few nodes with very high degree centrality, while the majority of the nodes have a very low degree centrality. Moreover, scale-free networks are robust against failure. In other words, if one of the entities were excluded or ceased to be part the network, the structure of the network would not change, and the network would not collapse.⁹⁵

One more type of network is the so-called random network, where entities are joined through random links or through probability.⁹⁶

Lastly, in a graph it is possible to also examine the ego-network of a node, which includes the examined node, its adjacent nodes and all the edges connecting them.⁹⁷ Ego-networks offer the possibility of a multi-scalar analysis of site assemblages, by allowing to zoom in and focus on single elements, such as single artefact types.⁹⁸ As an example, Sindbæk has examined the ego-networks of steatite vessels in his study of Northern Europe in the Viking era.⁹⁹

89 De Nooy, Mrvar, and Batagelj 2005, 140; Easley and Kleinberg 2010, 51–53.

90 Scott 2017, 120.

91 Easley and Kleinberg 2010, 51–53.

92 Easley and Kleinberg 2010, 57–58.

93 Brughmans 2010, 277; Collar 2014, 100–1; Sindbæk 2007b, 61–62.

94 Collar 2014, 100–101; Östborn and Gerding 2015, 332.

95 Sindbæk 2007b, 62.

96 Östborn and Gerding 2015, 311–12.

97 Brughmans 2013, 634; De Nooy, Mrvar, and Batagelj 2005, 145–46.

98 Collar et al. 2015, 10.

99 Sindbæk 2013, 78–81.

Affiliation and diffusion networks, and their application

In archaeological research, two-mode networks often belong to the so-called affiliation networks. In social network analysis, one set of the entities of the affiliation networks is usually formed by people, while the other set is formed by their shared membership in groups or participation in common events.¹⁰⁰ In archaeology, one set of entities can be composed of the sites or contexts, or even categories of people,¹⁰¹ sharing objects with similar features such as fabric, technology, shape, decoration, while the other set can be composed of the shared objects.¹⁰² The problem is that these affiliation networks, like other networks analysed in archaeological research, do not offer precise and unequivocal parameters for the analysis.¹⁰³ In other words, it is not possible to connect the entities, namely the sites, through simple directional links, where artefacts originate in a place and from there are transported somewhere else. It is possible though, to detect currents or trends of comparable material.¹⁰⁴ This is the case with the networks produced in the present work, where the types of objects are not considered to originate at a site and be brought from there to another site. To go back to an older example, in Figures 29-32 in Chapter 8, Qau el-Kebir and Esna are linked, or affiliated, because they share two types of stone vessels (Types 6 and 12), but it is not considered if the objects originated at one of the sites and ended up at the other one.

Similar to the affiliation networks are the so-called diffusion networks, where entities are linked when their connection could eventually lead to the spread of an innovation from one of them to the other.¹⁰⁵ Thus, in archaeology the entities are the sites where a particular innovation is found, while the links in the graphs represent the contacts through which the innovation is transmitted.¹⁰⁶ These contacts change with time, as they can appear, disappear or become weaker or stronger.

Nevertheless, it should be kept in mind that, because of the nature of network analysis in archaeology, in affiliation and diffusion networks the connections shared between sites does not necessarily mean direct contact, nor one-to one transfer of knowledge or material: the similarities detected could have reached the sites in a more indirect way, which cannot be known because

100 Brughmans 2013, 627; De Nooy, Mrvar, and Batagelj 2005, 101–20; Easley and Kleinberg 2010, 93–95.

101 Knappett 2011.

102 Brughmans 2013, 638–39; Sindbæk 2013, 74–76.

103 Brughmans 2013, 638–39; Sindbæk 2013, 76.

104 Brughmans 2013, 638–39; Sindbæk 2007b, 66; Sindbæk 2013, 82.

105 De Nooy, Mrvar, and Batagelj 2005, 161–84.

106 Östborn and Gerding 2015, 309–10.

of lack of data.¹⁰⁷ The connections mostly indicate that sites having many similarities share a cultural affinity and are, therefore, more likely to have been in any sort of relation than sites having few or no similarities.¹⁰⁸ Furthermore, when in the graph of a weighted networks the links are thick, namely have a large number of similarities forming them, the connections could be considered significant.¹⁰⁹ For example, in Figures 29-32 in Chapter 8, Edfu and Harageh have six types of stone vessels in common. Even though we cannot say how the types reached the sites, this tells us that these sites have a stronger connection than between Qau el-Kebir and Esna, which share only two types of stone vessels. The difference is rendered visually: the link joining Edfu and Harageh is thicker than the one joining Qau el-Kebir and Esna.

There are several processes that can be involved in affiliation and diffusion networks and, therefore, explain exchanges of goods and ideas between sites; they include trade, movements of people, local imitations, and similar parallel developments.¹¹⁰ Nevertheless, the fundamental elements of these processes are communication and contacts between sites, which can be expected to be closer between sites of the same region, because these are entities of the same group, than between sites belonging to different regions, because these are entities belonging to different groups.¹¹¹ This is one of the reasons why looking for traces of this communication can help understand which places had closer interaction and, thus, were part of the same group, namely of the same region.¹¹² Furthermore, conducting network analysis on a larger scale, that is to say on a regional scale, gives a wider image and can help understanding which processes are at play and how the sites interacted.¹¹³

This is the reason why network analysis has been used also to study regionalization, such as in Knappett's research on Greece,¹¹⁴ and in Blake's research on pre-Roman Italy.¹¹⁵ In detail, Knappett has used material culture to examine relations on different scales, starting from the face-to-face ones happening inside a community, and ending in the regional one. Blake has detected the origins of two regions, the Etruscan and the Latin ones, on the

107 Östborn and Gerding 2015, 309–10.

108 Blake 2013, 211; Golitko and Feinman 2015, 216; Mills, Roberts Jr., et al. 2013, 187; Östborn and Gerding 2014, 75, 81; Peeples and Roberts Jr. 2013, 3003; Peeples et al. 2016, 61, 66; Sindbæk 2007b, 66; Sindbæk 2013, 74, 82.

109 Golitko and Feinman 2015, 216; Peeples and Roberts Jr. 2013, 3003.

110 Peeples and Roberts Jr. 2013, 3003; Peeples et al. 2016, 61.

111 Peeples and Roberts Jr. 2013, 3003; Peeples et al. 2016, 61; Sindbæk 2007b, 66; Sindbæk 2013, 73.

112 Blake 2013, 205.

113 Golitko and Feinman 2015, 237; Peeples and Roberts Jr. 2013, 3003; Peeples et al. 2016, 61; Sindbæk 2007b, 66; Sindbæk 2013, 73.

114 Knappett 2011.

115 Blake 2013.

basis of the two different kinds of network created by the sites of each region, showing how the use of similar objects can signify tighter communications between sites and, as a consequence, their belonging to the same regional group. Moreover, regions are defined on the basis of detected networks also in Coward's research on regional groups in the Near East during the Neolithic and Epipalaeolithic periods,¹¹⁶ while the exchange of obsidian has been used to study the network in Mesoamerica between 900 BC and AD 1250.¹¹⁷ Furthermore, Collar has studied epigraphic data through network analysis to examine the Jewish diaspora after the destruction of the temple of Jerusalem, showing both how the need to affirm the Jewish identity was felt after the loss of the temple, and how network analysis can be useful in studying ethnicity.¹¹⁸ Lastly, Sindbæk has used network analysis to study the regional interactions and the role of towns in Northern Europe during the Viking era.¹¹⁹

In Egyptology, network analysis has been applied in very few studies. One of these is the research conducted on the network of kings and vassals in the Near East in the Late Bronze Age, as re-constructible from the data retrieved from the Amarna letters.¹²⁰ A second study has detected, from written documents, the network of the members of the royal family and court in the Old Kingdom, to study both how the ties in this network affected the career of its members and the distribution of power, and eventual cases of 'nepotism'.¹²¹ Another study has analysed the network connected to a bishop, to better understand the development of the Coptic church based in the Theban region.¹²² Lastly, a project has collected all the data related to the personal names found on papyri, in several languages, from Greco-Roman Egypt. This project makes them available on an online platform and has applied the methodologies of network analysis to several of them.¹²³

Measuring the network

Measures that can be calculated to study and interpret the graphs are various, but the most used are the so-called centrality measures, which analyse the role and value of each entity in a network;¹²⁴ in most cases they do not seem

116 Coward 2010; Coward 2013.

117 Golitko and Feinman 2015.

118 Collar 2013; Collar 2014.

119 Sindbæk 2007a; Sindbæk 2007b; Sindbæk 2013.

120 Diane Harris Cline 2015; Cline and Cline 2015.

121 Dulíková and Mařík 2017.

122 Dekker 2016; Dekker 2018.

123 Broux 2017.

124 Cline and Cline 2015, 29.

to depend on the size of the network.¹²⁵ These measures can also be visualized in the graph: in the same way that is possible to adjust the thickness and colour of the edges, it is also possible to give different colours, sizes and even shapes to the nodes, on the basis of how they score in the measure taken into consideration.¹²⁶

One of the centrality measures is the closeness centrality, which indicates how easily an entity reaches the others and can be reached by them.¹²⁷ It is based on the total distance between the examined entity and all the other entities in the network; it is calculated by dividing the number of entities in the network by the sum of all distances between the examined entity and the all the other entities.¹²⁸ From the closeness centrality it is possible to derive the closeness centralization, by dividing the closeness centrality scores of all the entities of a network by the maximum variation in closeness centrality scores possible in the same network.¹²⁹

A further centrality measure is the betweenness centrality, which shows how important the examined entity is as intermediary between two other entities, as well as to what extent it is needed as a linking element in the chains of contacts in a network¹³⁰ and how much flow passes through it and its links.¹³¹ The betweenness centrality of an entity is based on its position in the network and on how short or long the geodesics are between pairs of entities whose connection passes through the examined entity, as well as on the geodesics both between each pair of entities and between the two ends of the network.¹³²

In detail, the betweenness centrality of an entity measures how often the examined entity is on a geodesic between other entities¹³³ and is calculated by making a proportion of all the geodesics that include the examined entity,¹³⁴ or by first calculating how much flow arrives to the examined node from each of his neighbours, summing it up and adding one, then dividing the result by the edges leaving the examined node.¹³⁵ In a weighted network, this measure

125 Sindbæk 2007b, 67.

126 Cline and Cline 2015, 24.

127 Brughmans 2010, 296; Brughmans 2013, 636–38; Mills, Roberts Jr., et al. 2013, 186.

128 Brughmans 2013, 636–38; De Nooy, Mrvar, and Batagelj 2005, 127; Mills, Roberts Jr., et al. 2013, 186.

129 De Nooy, Mrvar, and Batagelj 2005, 127.

130 Brughmans 2010, 296; Brughmans 2013, 636–38; De Nooy, Mrvar, and Batagelj 2005, 127; Mills, Roberts Jr., et al. 2013, 186; Peeples and Roberts Jr. 2013, 3005; Scott 2017, 99–100.

131 Easley and Kleinberg 2010, 73–76; Newman 2001b.

132 Brughmans 2010, 296; Brughmans 2013, 636–38; Mills, Roberts Jr., et al. 2013, 186; Newman 2001b; Peeples and Roberts Jr. 2013, 3005; Scott 2017, 100.

133 Cline and Cline 2015, 32–33; Newman 2001b; Newman 2010, 185.

134 De Nooy, Mrvar, and Batagelj 2005, 127; Scott 2017, 100.

135 Easley and Kleinberg 2010, 81–82; Newman 2001b; Newman 2004, 4–5.

is mostly based on the weight of the links,¹³⁶ following the assumption that more similarities forming a link mean more contacts and, thus, a lower cost to maintain them.¹³⁷ Furthermore, betweenness centralization can be calculated by dividing the betweenness centrality scores of all the entities of a network by the maximum variation in betweenness centrality scores possible in the same network.¹³⁸

Another centrality measure here introduced is the degree centrality. It indicates how important an entity is, on the basis of the number of its connections, and it is calculated by counting how many links the examined entity has.¹³⁹ Though the importance of an entity in a network is not always revealed by the degree centrality,¹⁴⁰ this measure can actually be informative: for example, in a scale-free network it can show a group of important sites that could have been better linked to others and, thus, more influential in the spreading of innovations.¹⁴¹ This can be seen in Östborn and Gerding's study of the diffusion of fired bricks in Hellenistic Europe,¹⁴² as well as in the study of networks in pre-Hispanic US Southwest,¹⁴³ which is based on similarities in specific types of ware and obsidian objects.

In a binary network, degree centrality is simply formed by the number of links established by each entity, while in a weighted network this measure is formed by the sum of the weights of the links established by the examined entity.¹⁴⁴ In a directed network, it is possible to calculate also the indegree measure and the outdegree measure of an entity. The indegree measure of an entity is the number of arcs whose receiver is the examined entity, namely the number of arrows in the graph that point towards the examined node, while the outdegree is the number of arcs whose sender is the examined entity, namely the number of arrows in the graph that start from the examined node.¹⁴⁵ Furthermore, from degree centrality it is possible to calculate the degree centralization of a network, which is the proportion between the degree

136 Newman 2004, 4–5; Peeples and Roberts Jr. 2013, 3005.

137 Peeples and Roberts Jr. 2013, 3005.

138 De Nooy, Mrvar, and Batagelj 2005, 131.

139 Brughmans 2010, 296; Brughmans 2013, 636–38; Cline and Cline 2015, 29; De Nooy, Mrvar, and Batagelj 2005, 63–64; Mills, Roberts Jr., et al. 2013, 186; Newman 2010, 168; Peeples and Roberts Jr. 2013, 3005; Peeples et al. 2016, 63.

140 Cline and Cline 2015, 30.

141 Östborn and Gerding 2015, 332.

142 Östborn and Gerding 2015.

143 Mills, Clark, et al. 2013; Mills, Roberts Jr., et al. 2013; Peeples et al. 2016.

144 De Nooy, Mrvar, and Batagelj 2005, 63–64; Peeples and Roberts Jr. 2013, 3005; Peeples et al. 2016, 63.

145 De Nooy, Mrvar, and Batagelj 2005, 64; Scott 2017, 79–80.

centrality scores of the entities in a network and the maximum variation of degree centrality scores that the same network could contain.¹⁴⁶

The degree measure is used in network analysis also to detect k-cores, the structural cohesion of a network, and the power law distribution. A k-core is a group of nodes, or sub-network, associated by a least degree measure, so that in a network it is possible to determine several k-core groups based on the degree scores found.¹⁴⁷ Thus, k-cores are based on the number of links, because the degree measure is based on that:¹⁴⁸ they are useful to understand if nodes with a high degree are clustered or more sparse in the network.¹⁴⁹ The structural cohesion, or density, of a network represented in a graph is derived from the average degree of all the entities of the same network.¹⁵⁰ It does not depend on the size of the network, so that it can be compared between networks of different sizes.¹⁵¹ The power law distribution is measured by comparing the degree centrality scores of the nodes included in a network and by detecting if this is more or less evenly distributed or if some nodes have more ties and can be more influential in a network.¹⁵²

The last of the most used centrality measures is the eigenvector centrality, which indicates the influence of an entity in a network. It is based on the principle that entities have their importance increased by the connection to other entities that are themselves important in the network.¹⁵³ In other words, the importance of an entity is not based on the quantity of its connections, as in the degree centrality, but on the quality of these connections and on the importance of the entities with which it is linked.¹⁵⁴ Furthermore, in a weighted network, also the strength of each link is included in calculating the eigenvector centrality.¹⁵⁵ This measure is useful in larger graphs because it is calculated taking the entire network into consideration.¹⁵⁶ Also the eigenvector centrality can be very informative in examining the role of entities. For example, in a diffusion network where the sites all have an equal role in spreading the innovation, the eigenvector centrality is the measure that actually reveals

146 De Nooy, Mrvar, and Batagelj 2005, 126.

147 Brughmans 2010, 291; De Nooy, Mrvar, and Batagelj 2005, 70–72; Scott 2017, 127–30.

148 Brughmans 2010, 291.

149 De Nooy, Mrvar, and Batagelj 2005, 70–72.

150 De Nooy, Mrvar, and Batagelj 2005, 63–64; Newman 2010, 134.

151 De Nooy, Mrvar, and Batagelj 2005, 63–64.

152 Cline and Cline 2015, 35; Collar 2013.

153 Brughmans 2013, 636–38; Mills, Roberts Jr., et al. 2013, 187–88; Newman 2010, 169–172; Peeples and Roberts Jr. 2013, 3005; Peeples et al. 2016, 63.

154 Cline and Cline 2015, 30–31; Newman 2010, 169–72.

155 Mills, Roberts Jr., et al. 2013, 187–88; Peeples and Roberts Jr. 2013, 3005; Peeples et al. 2016, 63.

156 Peeples et al. 2016, 63.

how the sites have all the same importance, as also addressed in the study on networks in pre-Hispanic US Southwest.¹⁵⁷

Furthermore, it is possible to measure also the density of a network, which is the proportion between the links actually present in the graph visualizing the network and the maximum number of links that the same graph could contain;¹⁵⁸ when the density is at its maximum, the network visualized in the graph is called complete,¹⁵⁹ meaning that each entity is connected to all the other entities of the network.¹⁶⁰ This measure indicates the general connectedness of the network visualized in a graph,¹⁶¹ and depends on the dimension of the network, so that to compare different networks is better to use the structural cohesion.¹⁶²

Another measure, which is applied to edges, is the neighbourhood overlap. It is calculated by dividing the number of nodes neighbouring both the nodes that the examined edge connects by the number of nodes neighbouring at least one of those nodes.¹⁶³ Related to this measure is the embeddedness of an edge, which is made of the number of nodes adjacent to both the nodes linked by the examined edge.¹⁶⁴

Lastly, it is possible to apply partition to the graph. Partition is achieved by grouping the entities in the network, allotting each node to a group on the basis of a specific property resulting from measures calculated in the network analysis, or on the basis of an attribute registered in the database and independent from these measures.¹⁶⁵

METHODOLOGY OF THE PRESENT RESEARCH

In the present work, the entities are the sites where one or more contexts have been dated to the Late Middle Kingdom and the Second Intermediate Period, as well as objects found in these contexts, which include beads, stone vessels, scarabs, and weapons. Pottery is too extensive a material to insert in the research at the present stage, thus only very distinctive types, such as the Tell el-Yahudiyah ware and imports and imitation of Cypriot pottery are included in the analysis.

157 Peeples et al. 2016, 66–67.

158 De Nooy, Mrvar, and Batagelj 2005, 63; Easley and Kleinberg 2010, 120; Scott 2017, 81–84.

159 De Nooy, Mrvar, and Batagelj 2005, 63; Easley and Kleinberg 2010, 120; Scott 2017, 84.

160 Easley and Kleinberg 2010, 120.

161 Scott 2017, 81–84.

162 De Nooy, Mrvar, and Batagelj 2005, 64; Scott 2017, 87–89.

163 Easley and Kleinberg 2010, 57–58.

164 Easley and Kleinberg 2010, 65–66.

165 De Nooy, Mrvar, and Batagelj 2005, 31–32.

The databases

Every object, or group of objects, of the same shape and material is considered a type, and is an entry in the database, where each column report one of its attributes. Each class of objects has its own database, and the attributes reported in the columns vary depending on the category of objects. The only attributes that remain constant in these databases are: the material that each type is made of, in the column 'Material'; the site and context where each type has been found, respectively reported in the columns 'Place' and 'Context'; the chronological phase to which the archaeological context/contexts, where each type is found, is/are dated, in the column 'Dating'; the publications where the objects are mentioned, in the column 'Bibliography'.

Where applicable, other columns are added to the database. One of these columns is 'Object', which reports the use of the objects: in the analysis of the beads it mentions if the objects are classified as beads, amulets, or pendants in the publications. While the use of the objects is not taken into consideration in the analysis, because it is not always clear and the publications are not sufficient to determine it, when clearly stated in the publications it has been included in the database for sake of completeness. When an already existing typology has been followed in the present work, such as for instance in the case of the scarabs, the Tell el-Yahudiyah ware, and the Cypriot pottery, another column added to the database is 'Type', which reports the number or denomination of the type under which the object can be classified according to the existing typology. The database of the Cypriot pottery has also a column where is specified if the specimens are locally made in Egypt or imported, because the two groups give different information and, therefore, have been considered separately in the analysis. The columns 'Object' and 'Type' are present also in the database of the weapons. They respectively specify the use of the weapons, which is taken into consideration in the analysis because it makes a significant difference between the weapons, and the types to which their belong: these types follow the classification specifically constructed for the present research.

Finally, other columns are specific to the classes of objects. For instance, the database of the beads also contains the columns 'Shape' and 'Colour', where the shape and the colour of each type are reported: the colour is actually mentioned only for sake of completeness, but is not taken into consideration in the analysis, because it is not always recognizable and does not seem to have any particular significance for the purpose of the present work. The database of the stone vessels contains the columns 'Body', 'Rim', and 'Base', where the main parts of each type of vessel are described, as explained in the relevant chapter. The database of the scarabs contains the column 'Head, back', where, when possible, the shape of the objects is described, according

to an existing typology, as explained in the relevant chapter: however, this attribute is not taken into account in the analysis, because the available data are not sufficient. The database of the Tell el-Yahudiyah ware contains the column 'Fabric', where the fabric of the vessels is reported. Lastly, the database of the weapons contains the columns 'Attachment' and 'Blade', which respectively describe how the weapons were attached to their haft or shaft and the shape (and possible decoration) of their blade.

The matrices

From each database, three types of matrices have been derived, to generate the three different types of networks and graphs needed to answer the research questions of the present works. Each type of matrix has always been divided into the three phases studied in the present work, namely the Late Middle Kingdom, the Early Second Intermediate Period, and the Late Second Intermediate Period. Furthermore, on the contrary of the database, the structure of each type of matrix is the same for all the categories of objects.

The first type of matrix is a binary two-mode matrix, where each row corresponds to one of the sites examined and each column corresponds to one of the objects found at the sites. In this matrix, each cell reports the presence or absence of the objects corresponding to the column at the site corresponding to the row. Considering the quantity of contexts or the abundance in the analysis has not been preferred in the present work, because of the incomplete data available at present. While these data can be sufficient to consider the simple presence or absence of a type of object at a site, that is not the case when considering the number of contexts or the number of specimens inside each context.

The second type of matrix is weighted and one-mode. In this matrix, each row and each column both correspond to a site, and each cell reports how many types of objects are shared by the site corresponding to the row and the site corresponding to the column. Another option would have been reporting in an unweighted matrix only if similarities are present or absent, but this has been tried and has not given insightful results.

The third type of matrix is again one-mode but is based on the similarity index. In other words, the structure of this matrix is similar to the previous ones but, instead of reporting the number of types of objects shared, the cells report the similarity, numerically expressed, between the types of objects of the site of each row and of the site of each column. This also implies that, while the second matrix only considers part of the material culture, this third matrix considers the full range of the material culture. To obtain a similarity index, the two-mode matrices have been subjected to similarity analysis in the PAST program. The similarity index is a statistical method that measures and

ranks how similar the entities, corresponding to the rows of the matrix, are to each other on the bases of their attributes, corresponding to the column of the matrix: the scores range from 0, which is when absolutely no similarity is detected, to 1, which is the similarity that each site has to itself.

In our analysis, the sites are the entities to rank, and the objects are the attributes on which to base the ranking. Thus, the two-mode matrices used for the network analysis have been used also to calculate the similarity index, because the sites are reported in the rows and the objects are reported in the columns. There are several algorithms available to calculate the index similarity. Among these, in the present work the so-called Jaccard¹⁶⁶ has been used, which ranks the entities on the basis of the number of similar attributes shared, without taking into consideration their abundance, namely how many times each attribute is found for each entity. This statistical method, which was first used in botanical studies to examine the floral distribution in the Alps, has been chosen because its binary (i.e. presence/absence) nature is more fitting to the binary nature of the two-mode matrix and to the nature of the data available. It has also been used in archaeology, as for instance in the analysis of Neolithic networks in western Anatolia, the Balkans, and the Aegean,¹⁶⁷ where the number of sites is small, as in the present research.

The networks and the graphs

From the described matrices, ORA has been chosen as program to visualize the graphs of the networks, which are all undirected, because at the present stage it is not yet possible to recognize sending and receiving entities. The four centrality measures have been applied to all the graphs, so that each of the two one-mode graph has four versions, and in each one of them the size of the nodes is calibrated on one of the measures. In the graphs in the present work, the thickness of the links has also been calibrated on the weights, namely the number of shared similarities between the entities, or on the similarity index reported in the matrices.

From the first one-mode matrix, graphs based on one-mode weighted networks have been created. In the networks visualized in these graphs, the entities are the sites, and the links are based on the number of objects shared. This allows to focus merely on the connections between the sites and allows us to test the connections detected in the two-mode graphs.

From the third type of matrix, graphs based on one-mode unweighted networks have been again elaborated, where the entities are again the sites, but in this case the links are based on the similarity index between each pair

¹⁶⁶ Jaccard 1912.

¹⁶⁷ De Groot 2019.

of sites. This helps to understand which sites could be more related based on a similar material culture, because the similarity index is based on the full range of material culture and is useful to test the results of the previous graphs.

THE ANALYSIS OF THE MEASURES

In the following subsections, different aspects of the analysis are discussed: the measures in the first one-mode graph, the measures in the second one-mode graph, and the ranks.

The measures in the first one-mode graph

The four centrality measures analysed for the first one-mode graph include the degree centrality, the betweenness centrality, the eigenvector centrality, and the closeness centrality. The degree centrality is based on the number and strength of the links established by each site.¹⁶⁸ This means that this measure takes into consideration both the number of sites with which the examined site has more types of objects in common, and the number of the types of objects shared. Thus, this measure shows which sites have more objects in common with the larger number of sites and, as a consequence, have the stronger connections and could be considered the ending or starting point of the flow of communications and of the trend observed in the material culture. In Figure 2 and in Table 25 in Appendix II, for example, the degree centrality of Abydos calculates with how many other sites of the Late Middle Kingdom it has types of beads in common, and how many types are shared, and the size of its icon in the graph depends on this calculation.

The betweenness centrality focuses on how important each entity is as an intermediary in the relation between two other entities, thus how important each site is in bringing two other sites together.¹⁶⁹ This measure, then, shows important centres that could be passageways or (re)distribution centres.¹⁷⁰ In the first one-mode graph, this path is determined by the types of objects in common between the sites, with the idea that if two related sites, with similar types of objects, were passing by a third site to communicate with each other, or were in any way connected through a third site, there would be a trail in the material culture of this third site: the trail would be made of part of the types of objects in common between the first two sites. Therefore, the betweenness

168 Brughmans 2010, 296; Brughmans 2013, 636–38; De Nooy, Mrvar, and Batagelj 2005, 63–64; Newman 2010, 168; Peeples and Roberts Jr. 2013, 3005; Peeples et al. 2016, 63.

169 Brughmans 2010, 296; Brughmans 2013, 636–38; De Nooy, Mrvar, and Batagelj 2005, 127; Peeples and Roberts Jr. 2013, 3005; Scott 2017, 99–100.

170 Gjesfeld 2015; Rivers, Knappett, and Evans 2013.

centrality informs on which sites could be the most likely joining points in the communication between other sites. For example, in Figure 3 and Table 38 in Appendix II, the betweenness centrality of Abydos is based on how many sites of the Late Middle Kingdom are linked through it in the network of beads.

The eigenvector centrality is based on how connected the sites are to the sites more important to the network.¹⁷¹ In detail, this measure informs here about which sites established the connections of better quality, as based on the types of objects shared among them. For instance, in Figure 4 and Table 51 in Appendix II, the eigenvector centrality of Abydos shows with how many sites, important in the network of beads during the Late Middle Kingdom, it was connected.

The closeness centrality shows the sites that could be reached more easily through the connections established in the network.¹⁷² In detail, closeness centrality focuses on how reachable the sites were on the basis of the connections as detected through the types of objects shared among them. For instance, in Figure 5 and Table 61 in Appendix II, the closeness centrality of Abydos informs about how easy it was for the other sites of the Late Middle Kingdom to reach it in the network of beads.

The measures in the second one-mode graph

The same measures analysed for the first one-mode graph are analysed also for the second one-mode graph, based on the Jaccard similarity. The first centrality measure analysed is the degree centrality, which is based on the strength of the similarity in material culture between the sites. In other words, this measure considers how the full range of objects found at each site is similar to the found at the other sites, hence showing which sites display the higher degree of similarity in material culture with the higher number of sites. This means that the higher the score, the higher the number of sites with which it is similar. For example, in Figure 6 and Table 77 in Appendix III, the degree centrality of Dahshur calculates with how many sites of the Late Middle Kingdom it has a connection, while each connection is based on the similarity in the overall range of beads between Dahshur and the sites connected to it.

The betweenness centrality is based on the path that connects the sites through the similarity in their material culture, and it shows which sites can be detected as major intermediaries in these paths. That is to say that this measure determines which sites display such a similarity in their full range

171 Brughmans 2013, 636–38; Newman 2010, 169–72; Peeples and Roberts Jr. 2013, 3005; Peeples et al. 2016, 63.

172 Brughmans 2010, 296; Brughmans 2013, 636–38.

of objects with other sites, that they could be the more important sites in bringing together the other ones. For instance, in Figure 7 and Table 90 in Appendix III, the betweenness centrality of Dahshur is based on how many sites of the Late Middle Kingdom are linked through it, while each link is based on the similarity in the full range of beads between the sites that it connects.

The eigenvector centrality focuses on how connected the sites are to the sites more important in the network, based on the similarity in their material culture. Therefore, this measure informs us about which sites established the connections of better quality, based on the similarities in their full range of objects. For instance, in Figure 8 and Table 103 in Appendix III, the eigenvector centrality of Dahshur shows with how many sites of the Late Middle Kingdom important in the network it is linked, and each link shows the similarity in the full range of beads between Dahshur and these important sites.

The closeness centrality shows the sites that were more reachable through the links established in the network, as detected through the similarity in their material culture. In detail, this measure focuses on how reachable the sites were through the connections, established based on the similarities in their full range of objects. For example, in Figure 9 and Table 116 in Appendix III, the closeness centrality of Dahshur informs about how easy it is for the other sites of the Late Middle Kingdom to reach it, while each link is based on the similarity in the full range of beads between the sites that it joins.

The ranks

To better analyse the difference between the sites, the scores obtained by the sites for each measure are divided into five ranks, as conceived by the author of the present work: VH (=Very High), H (=High), M (=Middle), L (=Low), and VL (=Very Low). To create the ranks, at first the scale has been calculated, by dividing by five the difference between the highest and the lowest values scored by the sites. Then, the scale has been added five times to the lowest value scored by the sites, to calculate the lowest and highest score, namely the range, of each rank. For example, in Table 25 in Appendix II, 277 is the highest score detected for the degree centrality of the sites of the Late Middle Kingdom in the network of beads, while 28 is the lowest. At first, 28 has been subtracted from 277, giving 249. Successively, the number 249 has been divided by five, giving 49.8, which is the scale. Then, 49.8 has been added to 28 five times, giving the results 77.8, 127.6, 177.4, 227.2 and 277. These five results are the upper borders of the five ranks.

THE CORRESPONDENCE ANALYSIS

Given that the data in the analysis are only a sample, is it important to understand if the data available from each site can influence the results of the analysis. With this aim, the correspondence analysis is used in the present work. Correspondence analysis is an analytical tool provided by PAST, the same software used to calculate the Jaccard similarity for the second one-mode graphs in the present work. It examines the pattern between two sets of variables, namely between the data in the rows and the data in the columns of a table.

In the present work, the correspondence analysis examines the relations between the variety of types retrieved at the sites and how the same sites score for the different measures. Given that the measures for the two types of one-mode graphs sometimes differ in a remarkable way, the correspondence analysis is conducted for each one of them. More specifically, the columns report the ranks detected for the measures, so that each column corresponds to one of these ranks. The following columns are included in the table: VHD (Very High Degree centrality), HD (High Degree centrality), MD (Middle Degree centrality), LD (Low Degree centrality), VLD (Very Low Degree centrality), VHB (Very High Betweenness centrality), HB (High Betweenness centrality), MB (Middle Betweenness centrality), LB (Low Betweenness centrality), VLB (Very Low Betweenness centrality), VHE (Very High Eigenvector centrality), HE (High Eigenvector centrality), ME (Middle Eigenvector centrality), LE (Low Eigenvector centrality), VLE (Very Low Eigenvector centrality). The ranks of the closeness centrality have not been included in the table, because this measure is mostly similar for all the sites and has not proven to be very informative so far.

The rows of the table number five in total; they group the sites based on the number of types found at each site. In detail, the smallest number reported has been subtracted from the largest one. Then, the remaining number has been divided into five, to determine the scale. This scale has then been added five times to the smallest number of types, to calculate the lowest and highest number of each group. Five groups have been assigned, starting from the one with the sites having the lowest number: very low variability (VLV), low variability (LV), middle variability (MV), high variability (HV), very high variability (VHV).

For example, for the Late Middle Kingdom the largest number of types included in the analysis is 103, from Harageh, while the smallest is three, from Ain Asil. Thus, three has been subtracted from 103, and the remaining 100 has been divided into five: the result is of course twenty. Then, twenty has been added five times to three. In short, each cell reports how many of the sites belonging to the group of each row belong to the rank represented

by the column. For each phase, one table has been created with the results of the first one-mode graph, and one table has been created with the results of the second one-mode graph. Then, each table has been imported in PAST and examined with the tool of the correspondence analysis.

MATERIALS

This chapter introduces the materials used to manufacture the objects, made during the Late Middle Kingdom and the Second Intermediate Period, examined in the present work. These materials are important, for two main reasons. The first reason is that, in the analysis conducted in the present work, materials are part of what defines a type, which is made of both the shape and the material of an object. Consequently, two objects having the same shape, but being made of different materials, are two different types. The second reason is that, as it will be further shown in the relative chapter, analysing the distribution of materials and of the objects made of them can help understand better the relationships between the sites.

Before proceeding, it should be clarified that in the present work, because this focuses on Egypt, for the Eastern Desert is considered only the Egyptian part, not the Nubian part. Therefore, the central part of the Eastern Desert is considered the one in Middle Egypt, while its southern part is considered the one in southern Upper Egypt.

GEMSTONES

The first category of materials introduced in the present chapter are gemstones, which are pieces of minerals, namely strong chemical compounds naturally occurring in pure form, that can be cut and worked to make jewellery or other adornments. Therefore, in this section the minerals forming these gemstones are described. Most of the gemstones mentioned in the present work are based or at least contain quartz, which is a mineral composed of silica and oxygen. Therefore, in this section quartz-based gemstones have been separated from the other ones.

Quartz-based gemstones

Quartz-based gemstones include amethyst, rock crystal, carnelian, agate, and jasper. Quartz is a mineral composed of silica and oxygen. It can be translu-

cent or opaque and acquires a milky colour when it has many cavities that get filled with water. It is widely found along the Nile Valley.¹

Rock crystal, also called quartz crystal, is a transparent variety of quartz. Its sources are in the Western Desert between the oases of Fayyum and Bahariya, and in the Sinai.²

Amethyst is a transparent, purple variety of quartz. It can be found in the Eastern Desert in southern Upper Egypt, in Middle Egypt, as well as between the latitudes of Assiut and Aswan. In detail, quarries are known in Wadi Abu Had, at Abu Diyeiba near Wadi Waseef, in and near Wadi el-Hudi (respectively numbers 15, 21, 36 on Map 1).³

Carnelian is a variety of chalcedony, a type of quartz mixed with moganite, which is a mineral like quartz and made of silica and oxygen. Carnelian is translucent and its colour varies from medium orange to brownish red, due to impurities of iron oxide. Carnelian was mined in the Western Desert at Stela Ridge, near Gebel el-Asr in the area of Abu Simbel, as well as in the Eastern Desert, in the area of Wadi Abu Gerida and in Wadi Saga, both at the latitude of the Theban area (respectively numbers 38, 39, 20, 26 on Map 1).⁴

Agate is an opaque variety chalcedony, made of concentric or, less often, horizontal bands. It is monochrome or multicoloured with colour varying from white to brown, depending on the amount of iron dioxide impurities it contains. It is attested in the Eastern Desert in Wadi Abu Gerida (number 20 on Map 1), though it can be commonly found on the surface in the form of pebbles.⁵

Jasper, known also as chert, is an opaque variety of chalcedony or of quartz containing impurities such as iron and, due to these impurities, varying in colour mostly from red to yellow, brown, and green. A deposit is known in Wadi Hamedra, in the Eastern Desert north of the area of Thebes (number 22 on Map 1).⁶

Other types of gemstones

Other types of gemstones include green feldspar, garnet, haematite, and turquoise. Green feldspar, also called amazonite, is an aluminosilicate, namely a mineral made of aluminium and silica and oxygen, which are combined with potassium. It varies from opaque to translucent, and from light green to bluish-green. Its sources are in the Eastern Desert in southern Upper Egypt,

1 B.G. Aston 1994, 65; Aston, Harrell, and Shaw 2000, 51–52; Lucas 1948, 459–60.

2 B.G. Aston 1994, 64–65; Aston, Harrell, and Shaw 2000, 50–53; Lucas 1948, 459–60.

3 B.G. Aston 1994, 66–67; Aston, Harrell, and Shaw 2000, 50–52; Lucas 1948, 445.

4 B.G. Aston 1994, 67–68; Aston, Harrell, and Shaw 2000, 26–27; Lucas 1948, 448.

5 B.G. Aston 1994, 68–69; Aston, Harrell, and Shaw 2000, 26; Lucas 1948, 442–43.

6 B.G. Aston 1994, 69–71; Aston, Harrell, and Shaw 2000, 29–30; Lucas 1948, 454–55.

at latitudes between south of Thebes and south of Edfu. Quarries are known in Wadi Abu Muawad, at Gebel Migif, in Wadi Fayrouz, at Gebel Hafafit, and in Wadi Gemal (respectively numbers 27, 31, 34 on Map 1).⁷

Garnet is an aluminosilicate that can be combined with magnesium, iron, or calcium. It varies from transparent to opaque and occurs in all colours except for blue. It is found in many parts of Egypt, going from the Sinai to the southern Eastern Desert, especially in the areas of Wadi Gemal, Wadi Sikait, and Gebel Mitiq (respectively numbers 34, 33, 25 and on Map 1), to the area of Kom Ombo.⁸

Haematite is an iron oxide; in other words, it is composed of iron and oxygen. It is opaque and its colour varies from metal black-grey to reddish brown. Though haematite was widely found in Egypt, deposits where it could be extracted are located in the Eastern Desert at Gebel Abu Marwat and in Wadi Dib, in the southern part of Middle Egypt, as well as in Wadi Abu Gerida and in Wadi Saga, at the latitudes of the Theban area (respectively numbers 16, 14, 20, 26 on Map 1).⁹

Turquoise is a hydrated phosphate of copper and aluminium, in other words it is made of phosphorus, oxygen and hydrogen combined with water and with copper and aluminium. It is opaque and its colour varies from light green to light blue. It was mined in the Sinai at Serabit el-Khadim, in Wadi Umm Themaim, and at Gebel Maghara (respectively numbers 1 and 2 on Map 1).¹⁰

ROCKS

The second category of materials included in the present work include rocks, which are divided into sedimentary, metamorphic, volcanic, and plutonic.

Sedimentary rocks

Sedimentary rocks originate from the deposition of mineral or organic particles on the floor of oceans or other bodies of water. They include limestone, siltstone, travertine, calcite-alabaster, anhydrite, and sedimentary quartzite. Limestone is made mostly of calcite plus dolomite, or quartz, or aluminosilicate, or iron oxide. Calcite is calcium carbonate, thus it is made of calcium and carbon and oxygen, while dolomite is magnesium carbonate, thus it is made of magnesium and carbon and oxygen, and aluminosilicate is made of aluminium and silica and oxygen. Limestone is opaque and its colour varies

7 Aston, Harrell, and Shaw 2000, 45–46; Lucas 1948, 450–51.

8 Aston, Harrell, and Shaw 2000, 31–32; Lucas 1948, 451–52.

9 B.G. Aston 1994, 73; Aston, Harrell, and Shaw 2000, 38; Lucas 1948, 452.

10 Aston, Harrell, and Shaw 2000, 62–63; Lucas 1948, 460–61.

from almost white to grey to black. Deposits of limestone are scattered all along the Nile Valley, from Esna up to the Mediterranean coast, with at least 88 known quarries; some formations are found also in the Western Desert and in the Eastern Desert.¹¹

Siltstone is composed predominantly of silt-sized particles, namely particles just slightly larger than sand grains, of quartz and feldspar, which is an aluminosilicate combined with potassium. Siltstone is opaque and its colour ranges from greenish to greyish. In Egypt it is found in the northern and central Eastern Desert, and was mined mostly in Wadi Hammamat, north of the Theban area (number 24 on Map 1).¹² This material has traditionally been called schist in Egyptology, though in the present work the denomination siltstone is preferred.

Calcite-alabaster is made of calcite and aragonite, which are types of calcium carbonate, namely minerals made of calcium, carbon, and oxygen. It is translucent and made of bands, and its colour varies from white or yellowish to brownish. It is found in Wadi Hof and in Wadi el-Garawi, near Helwan and south of Cairo, in Wadi Araba in the Eastern Desert at the same latitude of the Fayyum, as well as in Wadi Umm Argub, at el-Qawatir, in Wadi el-Barshawī, in Wadi el-Zebeida, at Hatnub, and near Wadi Assiut, all sites along the Nile Valley in Middle Egypt (respectively numbers 5, 8, 10, 11, 12, 13 on Map 1).¹³ Calcite-alabaster has been traditionally called alabaster in Egyptology. Nevertheless, real alabaster is a different type of stone, described in the next paragraph. It has also been called travertine. However, it is advised to use the denomination calcite-alabaster instead of travertine.¹⁴ Therefore, calcite-alabaster is the denomination used in the present work.

Alabaster is a type of gypsum, a soft sedimentary rock and a mineral made of calcium sulphate dihydrate, namely calcium, sulphur, oxygen, and water. It is translucent or opaque, and its colour varies from white to pink, to brownish. It can be found at Umm el-Sawan in the desert near the Fayyum, and near Wadi el-Anba'ut in the Eastern Desert north of Aswan, as well as on Ras Banas peninsula, on the Red Sea at the latitude of Aswan (respectively numbers 7, 32, 37 on Map 1).¹⁵

Anhydrite is a soft sedimentary stone and a mineral made of calcium sulphate, namely calcium, sulphate, and oxygen. It is vitreous and it ranges from being colourless to bluish, to violet, to greyish, to white, to pink, to reddish, to brownish. It is found between Wadi el-Imrani and Wadi Ibada on the east

11 B.G. Aston 1994, 35–39; Aston, Harrell, and Shaw 2000, 40–42; Lucas 1948, 471–72.

12 B.G. Aston 1994, 28–32; Aston, Harrell, and Shaw 2000, 57–58; Lucas 1948, 477–79.

13 B.G. Aston 1994, 42–47; Aston, Harrell, and Shaw 2000, 59–60; Lucas 1948, 447–48.

14 Klemm and Klemm 1991.

15 B.G. Aston 1994, 47–51; Aston, Harrell, and Shaw 2000, 21–22; Lucas 1948, 470–71.

bank of the Nile in Middle Egypt, though it is a secondary and probably recent deposit and therefore it is not considered in the present work, as well as near Wadi el-Anba'ut in the Eastern Desert at the latitude of Edfu, and on Ras Banas peninsula, on the Red Sea at the latitude of Aswan (respectively numbers 12, 32, 37 on Map 1).¹⁶ This material has traditionally be called blue marble in Egyptology, but in the present work the denomination anhydrite is preferred.

Sedimentary quartzite is a form of sandstone. Sandstone is a sedimentary rock formed by sand-sized grains of rock and mineral, bonded together by cementing elements such as quartz, calcite, iron oxide, or clay. In sedimentary quartzite, the cementing elements joining the grains hold them so tightly together, that the rock breaks across the grains and not around them. It varies from fine- to coarse-grained and often also contains pebbles. Depending on the elements present, its colour varies from brown to light grey, to nearly white, sometimes including yellow, orange, red, and purple. It is found widely in the Western and in the Eastern Desert, and occasionally in the Nile Valley. Quarries are known at Gebel Ahmar, near Cairo, and between Gebel Tingara and Gebel Gulab, near Aswan (respectively numbers 4 and 35 on Map 1).¹⁷

Metamorphic rocks

Metamorphic rocks originate from the transformation of existing rocks due to heat or pressure. They include lapis lazuli, steatite, serpentine, and marble. Lapis lazuli is made mainly of lazurite, which is a type of aluminosilicate combined with potassium. It is opaque and blue. It is not found in Egypt, but was imported from Western Asia, where it is found mostly in Afghanistan.¹⁸

Steatite, also known as soapstone, is composed predominantly of talc, which is a hydrated magnesium silicate, namely a mineral composed of magnesium, silica, oxygen, and water. It is opaque and its colour varies from white to yellowish, to greenish, to reddish. It was mined in the central and southern parts of the Eastern Desert in Wadi Saqiyah, in Wadi Abu Muawad, in and near Wadi el-Humra, near Wadi Abu Qureya, in Wadi Umm Salim, at Gebel Rod el-Barram, at Gebel Salatit, in Wadi Barramiya, near Wadi Mubarak, in Wadi Sikait, in Wadi Kamoyid (respectively numbers 23, 27, 28, 33, 43 on Map 1).¹⁹

Serpentine is the mineral forming the hard, metamorphic rock serpentinite, and in the present work is a synonym of the latter. Serpentine is a hydrated magnesium silicate, like steatite but containing more water. It var-

16 B.G. Aston 1994, 51–53; Aston, Harrell, and Shaw 2000, 22–23; Lucas 1948, 470–71.

17 B.G. Aston 1994, 33–35; Aston, Harrell, and Shaw 2000, 53–55; Lucas 1948, 477.

18 B.G. Aston 1994, 72–73; Aston, Harrell, and Shaw 2000, 39–40; Lucas 1948, 455–56.

19 B.G. Aston 1994, 59–60; Aston, Harrell, and Shaw 2000, 58–59; Lucas 1948, 479–80.

ies from opaque to translucent and from greenish to yellowish, to white, to brownish, to grey, to black. It is widely present in the Eastern Desert and was predominantly mined between the Theban area and south of Aswan in Umm Esh, in the Barramiya-Dungash area, in Wadi Shait, at Gebel Sikait, and in the Muqsim area (respectively numbers 19, 27, 29, 33, 42 on Map 1).²⁰

Marble is made of calcite or dolomite combined with other minerals. Therefore, its appearance varies on the base of the minerals involved, from opaque to crystalline and from white to blackish. It is found in the southern part of the Eastern Desert, more in detail in Wadi Dib, at Gebel Rokham, and in Wadi Haimur (respectively numbers 14, 27, 41 on Map 1).²¹

Volcanic rocks

Volcanic rocks originate from magma solidified above ground and include obsidian and basalt. Furthermore, one vessel of porphyry has been reported in the publications, in a context of the Late Middle Kingdom. It is not sure what the author meant, because real porphyry is a volcanic rock found in the Eastern Desert and in the Sinai and used almost exclusively in the Roman period.²² Sometimes, though, porphyry has been used in Egyptology to designate a type of diorite, which is a completely different type of rock.²³ Therefore, in the present work, this rock is considered just an undefined rock.

Obsidian is a volcanic glass, formed from quickly cooled magma rich in the elements that compose quartz and feldspar. It is vitreous and its colour varies from black to bluish, to brownish, to gold. It was imported from Ethiopia and Eritrea, and probably from the Aegean, the southern Arabian Peninsula and from the Levant.²⁴

Basalt is a hard, volcanic rock, formed from quickly cooled magma rich in magnesium and iron. It is opaque and its colour varies from black to dark grey. Its sources are widespread in Egypt, with known ones around modern-day Cairo, at Tilal Sawda, and near Samalut, and the two latter on the west bank of the Nile in Middle Egypt (number 9 on Map 1). One known quarry is at Widan el-Faras on Gebel el-Qatrani, in the Fayyum (number 6 on Map 1).²⁵

20 B.G. Aston 1994, 56–59; Aston, Harrell, and Shaw 2000, 56–57; Lucas 1948, 479–80.

21 B.G. Aston 1994, 55–56; Aston, Harrell, and Shaw 2000, 44–45; Lucas 1948, 472–73.

22 B.G. Aston 1994, 21–23; Aston, Harrell, and Shaw 2000, 48–49; Lucas 1948, 474–77.

23 B.G. Aston 1994, 13–15; Aston, Harrell, and Shaw 2000, 30–31; Lucas 1948, 465–67.

24 B.G. Aston 1994, 23–26; Aston, Harrell, and Shaw 2000, 46–47; Lucas 1948, 473–74.

25 B.G. Aston 1994, 18–21; Aston, Harrell, and Shaw 2000, 23–24; Lucas 1948, 463–64.

Plutonic rocks

Plutonic rocks originate from magma solidified underground. The only plutonic rock included in the present work is diorite, which is mostly composed of plagioclase and hornblende. Plagioclase is a type of feldspar, while the hornblende is a type of silicate, namely a mineral made of silica and oxygen, combined with iron, magnesium, and calcium or aluminium. Diorite is crystalline and granular, and its colour ranges from grey to dark-grey, to black, to bluish-grey. It was commonly found in the Eastern Desert, and was mined in Wadi Umm Shegilat, north of the Theban area (number 17 on Map 1).²⁶

METALS

Metals included in the present work include gold and electrum, silver, and copper. Gold is a soft and easily workable metal, reddish-yellow in colour. It comes mostly from the Eastern Desert, especially from near Koptos and near the Wadi Allaqi, and modern Sudan (respectively numbers 18 and 40 on Map 1). It was sometimes used in alloy with silver or copper or other metals.²⁷ Also electrum, which is a natural alloy of gold and silver, can be found in gold ores.²⁸ Given that the sources are the same, gold and electrum are considered together in the present work.

Silver is a soft metal, white, and lustrous. It can be found pure, or it can come as a by-product of copper, gold, lead, and zinc processing. In Egypt it is not found pure, but only in traces in gold or lead ores in the Eastern Desert. Therefore, it was mostly imported, probably from Asia Minor or the Aegean, where it is more common.²⁹ However, there is the possibility that objects were produced from silver originating from the Egyptian gold mines.³⁰

Copper is a soft and easily workable metal, yellowish–pinkish in colour. It can be found pure or be extracted from ores through specific procedures. It comes mostly from the Eastern Desert, in areas such as Wadi Araba at the latitude of the Memphis-Fayyum area, Wadi Sitra east of Luxor, Hammash near Aswan, and from the Sinai, mostly in Timna and Serabit el-Khadim (respectively numbers 8, 28, 30, 1, 2 on Map 1). It is often found associate with gold, and in alloys with other metals.³¹ One of these alloys is bronze, which is made of copper, tin, and other metals such as aluminium.

26 B.G. Aston 1994, 13–15; Aston, Harrell, and Shaw 2000, 30–31; Lucas 1948, 465–67.

27 Lucas 1948, 257–62; Ogden 2000, 161–64.

28 Lucas 1948, 267–68; Ogden 2000, 161–64.

29 Lucas 1948, 478–83; Ogden 2000, 170–71.

30 Gale and Stos-Gale 1981.

31 Lucas 1948, 228–36; Ogden 2000, 149–55.

FAIENCE AND OTHER MATERIALS

Widely used for the production of objects and locally made, faience is a glazed non-clay ceramic material, which is also included in the present work. It is composed mainly of crushed quartz or sand, thus silica and oxygen, with small amounts of lime, which is a compound made of calcium and oxygen, and either natron, which is a compound made of sodium and carbon and oxygen and water, or plant ash. This mixture was diluted with water and then fired. The main colours in which faience was produced are blue, green, yellow, white, black, which were obtained by adding specific minerals or metals to the mixture, such as copper to obtain a blue-green colour.³²

Finally, other materials used for the production of objects and mentioned in the present work include: bones, which were taken from various animals and were commonly used in ancient Egypt;³³ ostrich eggshells, which were found in the southernmost part of both the Eastern and the Western Desert;³⁴ mother of pearl, which comes from the shell of pearl oysters, mostly from the Red Sea, was used more commonly in Nubia than in Egypt, and characterizes the Pan-grave tombs.³⁵ It should be mentioned that ostrich eggshell has sometimes been classified as mollusc shell, therefore in the present work is referred to simply as shell.³⁶

32 Lucas 1948, 179–206; Nicholson 1998; Nicholson and Peltenburg 2000.

33 Krzyszkowska and Morkot 2000; Lucas 1948, 39.

34 Lucas 1948, 48–49; Phillips 2000.

35 Lucas 1948, 48.

36 Xia 2014, 104.

BEADS

Beads are among the objects more commonly found in archaeological contexts.¹ In archaeological publications, they are so numerous that they are often registered in separate catalogues.² Beads could be used in usekh collars, bracelets or anklets, wigs, whisks, or – especially in Pan-grave tombs – on leather garments, all objects that were found on the body of the deceased or in vessels or chests, though the strings that they were attached to have often not survived.³ This means that the beads are often found dispersed in their contexts and it is not possible to reconstruct what the original objects that they were a part of originally looked like, or how they were arranged.⁴ Because of this, in the present work, the types of beads found in each context are examined without taking into consideration how they were strung or how they were used.

Beads are very portable. Therefore, they can be good indicators of cultural exchanges, with the due cautions and analysis.⁵ While these exchanges imply contacts between people, through commercial or professional or personal relations, they cannot always imply direct exchanges between sites. In other words, if the same type of bead is found on two or more sites, this does not necessarily mean that people from one site brought it to the other site, but only that people on both sites were characterized by a similar material culture.⁶ This happens because the archaeological bias and the difficulty in dating part of the contexts, the same type of beads could have arrived from one site to the other through a third site or through even more indirect ways, but we still ignore it because we miss the information or the data.⁷

1 Xia 2014, 3.

2 As in: Brunton 1948; Brunton, Gardiner, and Petrie 1930; Brunton and Morant 1937; Downes 1974; Engelbach and Gunn 1923; Wainwright and Whittemore 1920; Xia 2014.

3 See for example the discussion in: Brunton 1920; De Morgan, Legrain, and Jéquier 1903; De Morgan et al. 1895; Winlock 1934.

4 This can be seen in nearly all the publications mentioned in this chapter.

5 Xia, 2014, 3–4.

6 Brughmans 2013, 638–39; Sindbæk 2007b, 66; Sindbæk 2013, 74–76, 82.

7 Sindbæk 2013, 72.

Moreover, beads are usually easier to shape than other objects. As a result, they usually feature a conspicuous typological variety that changes through time,⁸ and have been the subject of detailed typological analyses.⁹ There are also types and techniques that are more typical of a particular period. Hence, there is the possibility of using the beads to date an archaeological context, namely the location where they are found and the other objects retrieved at the same location,¹⁰ though the process is not straightforward.¹¹

The main problem, when it comes to dating archaeological contexts through beads, concerns how long particular types of beads continued in use. Although each period of Egyptian history has specific types of beads produced with specific techniques, it is possible that a context contains ‘fossils’ or intrusions, which are not always easy to spot¹². With ‘fossils’ are described beads produced in periods earlier than the one to which their context is dated. They can be found in a later context because they were still in use, were reused, or kept as heirlooms, or because they entered into an archaeological context as the result of post-depositional accidents.¹³ ‘Intrusions’ are beads produced in periods later than the context, where they are found because of post-depositional accidents.¹⁴ Post-depositional accidents are those events happening after the context was originally created, altering its contents or appearance.¹⁵

For the present research, the fossils are included in the analysis, because the aim is to study what the sites shared and what they tell of the material culture in use during the Late Middle Kingdom and the Second Intermediate Period. Hence, what is important is that the objects were in use during these periods, and not when they were produced. On the contrary, intrusions were not in use during the periods of interest to the present research, thus are selected and excluded from the analysis. For the same reasons, beads produced in the Late Middle Kingdom and the Second Intermediate Period, but found in contexts dated to later periods, are also excluded from the analysis because they do not give information about their use in the periods relevant to the present work.

Another element, that influences the use of beads for dating purposes, is that differences between the techniques and types of each period are subtle,

8 Xia 2014, 3.

9 Brunton, Gardiner, and Petrie 1928, 1930; Brunton and Morant 1937; Engelbach and Gunn 1923; Xia 2014.

10 Xia 2014, 3–4.

11 Xia 2014, 4–5.

12 Xia 2014, 5.

13 For a discussion on fossils: Xia 2014, 4–5.

14 For a discussion on intrusions: Xia 2014, 5–6.

15 For example, the intervention of tomb robbers or animals, or natural events such as floods or earthquakes: Renfrew and Bahn 2016, 49–72.

and if the material is not registered or published in detail, it is sometimes unfeasible to detect them and the possibility of dating the context is affected.¹⁶ Furthermore, beads have not been differentiated inside each period of Egyptian history. In other words, beads of the earlier part of the Middle Kingdom have not been distinguished from the ones of its later part, and the same is true for the beads of the Second Intermediate Period.¹⁷ For the present work, this means that only contexts that have been dated through other means have been used in the analysis, while undated contexts have been omitted. This choice has been made because only published material has been used for the present work, and the quality of the data there reported is often not good enough for using the beads for dating purposes.

The quality of the published material affects also other aspects of how the beads are used in the present work. First, the nomenclature of the shapes can change in the publications.¹⁸ This means that the same shape can have different names, depending on the authors. For example, the axle barrel-shaped and the ribbed beads are sometimes respectively referred to as acacia pod and melon beads. Furthermore, the piriform beads are sometimes named drop-shaped, but in the present publication the term drop-shaped has been used for another type of bead. From this, it is clear how choices have been made in the present chapter concerning the nomenclature, and for each shape one of the designations already used in the publications has been selected.

Moreover, the material of the beads could have sometimes been misinterpreted.¹⁹ Nevertheless, there is no way to check the correctness of the material reported in the publications. That is why the data reported in the publications have been followed in this analysis, with the only change being that faience was not separated from paste and bone was not differentiated from ivory, because in these cases the two words refer to the same type of material. Furthermore, beads of emerald and beads of glass are also reported in the publications. Nevertheless, both materials are known to be used only in times later than the period examined in the present work.²⁰ Considering that what in the publications is called glass is often actual faience,²¹ while what is called emer-

16 For example, in the publications concerning Abydos: Ayrton et al. 1904; Garstang, Newberry, and Milne 1901; Peet 1914; Randall-MacIver, Mace, and Griffith 1902.

17 This differentiation is not found in Naï's publication either.

18 For example, the shape of the beads from Harageh is described differently from the shape of the beads from Dahshur or Ain Asil: Aufrère and Ballet 1990; De Morgan, Legrain, and Jéquier 1903; De Morgan et al. 1895; Engelbach and Gunn 1923; Marchand, Soukiasian, and Bourriau 2010.

19 As it happens, for example, with the stones: B.G. Aston 1994, 11–74.

20 Xia 2014, 103–4, 111–12.

21 Xia 2014, 104.

ald is actually feldspar,²² glass and emerald have been respectively classified as faience and feldspar in the present work.

In addition, the beads are sometimes reported as pendants or amulets in the publications.²³ Pendants can usually be distinguished from beads because of the way they are used on strings: while beads are perforated through and through, either along the short or the long side, and the string passes completely through them, the pendants usually have a loop, either on their long or short side, and the string passes through the loop. Lastly, amulets are beads or pendants that carry magical or religious significance, for example because they represent a divinity. The distinction between beads, pendants, and amulets is not always clear in the publications. For example, the hawk-shaped, the hippopotamus-shaped, and the jackal-shaped beads are sometimes called beads, sometimes pendants, and sometimes amulets respectively representing the god Horus, the goddess Tawret, or the god Anubis. Nevertheless, the reason why they are classified in such manner in the publications is not clear. Furthermore, beads, pendants and amulets are grouped together in the catalogues, so that no real distinction is made. Because of this situation, and because the difference pertains only to how they were used, this aspect is not taken into consideration in the analysis.

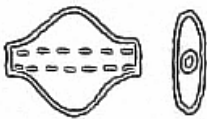
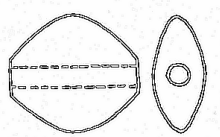
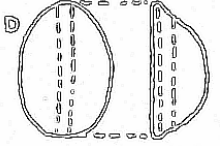
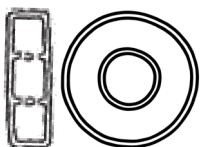
Finally, the quality of the published material does not always allow me to retrieve the data necessary for the analysis, namely the shape, the material, the colour, and the context of the beads. Especially in the older publications, the beads are not always reported in detail, but only the material or the shape is mentioned; sometimes, the contexts from which the beads were discovered are not properly mentioned either.²⁴ To tackle this issue, the information given in the texts has been combined and expanded upon with the information retrievable from the photographs or from other publications dealing with the same contexts, and from a study specifically dealing with the beads in ancient Egypt.²⁵ Nevertheless, when the insufficient data concerning a specific group of beads reported in the publications could not be completed, these beads have been left out of the analysis.

22 Xia 2014, 103.

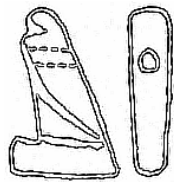
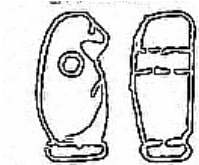
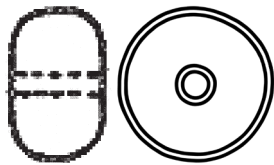
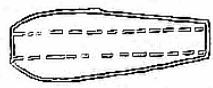
23 As for example in: Brunton 1948; Brunton, Gardiner, and Petrie 1930; Brunton and Morant 1937; Downes 1974; Engelbach and Gunn 1923.

24 This can be seen, for example, in the publications of the beads from Lahun or from Hu: Petrie, Griffith, and Newberry 1890; Petrie and Mace 1901; Petrie et al. 1891.

25 Xia 2014.

<i>Name</i>	<i>Description</i>	<i>Outline</i>
Axle barrel-shaped	Nearly biconical shape, very protruding on the long side. The section is thin, and the perforation runs longitudinally.	
Barrel	Nearly biconical shape, with very low curve on the long side. The perforation runs longitudinally.	
Biconical	Biconical shape, with perforation running longitudinally.	
Boss	Button-shape, namely round but with flat base and protruding rounded top. The perforation runs longitudinally.	
Cowroid	Shaped like a cowrie. The perforation runs longitudinally.	
Cylindrical	Shaped like a cylinder. The perforation runs longitudinally.	
Disc	Shaped like a disc, with a large perforation in the centre. The section is mostly square and thin.	
Drop-shaped	Shaped like a drop, with a loop on the top and/or on the bottom to be strung or hanged. The section is thin.	

(continued)

<i>Name</i>	<i>Description</i>	<i>Outline</i>
Flail	Shaped like a truncated cone. The perforation runs longitudinally.	
Fly-shaped	Shaped like a fly seen from above and with closed wings. The perforation runs between the two sides.	
Hawk-shaped	Shaped like a standing hawk. The perforation runs between the front and the back or between the two sides of the hawk. The section is mostly thin.	
Hippopotamus-shaped	Shaped like a hippopotamus standing on the hind legs. The perforation runs between the front and the back or between the two sides of the hippopotamus. The section can be thin or thick.	
Jackal-shaped	Shaped like a jackal standing on the hind legs. The perforation runs mostly between the two sides of the jackal. The section is mostly thin.	
Lentil	Shaped like a squat spheroid. The perforation is thin and runs in the centre of the spheroid.	
Piriform	Shaped like a pear, cylindrical and with one end of the short side larger than the other. The perforation runs longitudinally.	

(continued)

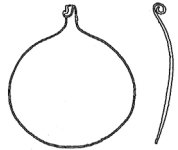
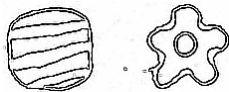
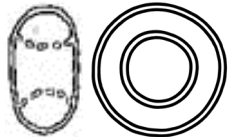
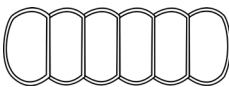
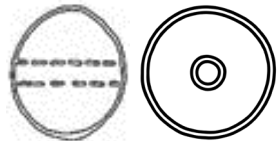
<i>Name</i>	<i>Description</i>	<i>Outline</i>
Mus- sel-shaped	Shaped like a mussel shell, with perforation or small loop on the top to be strung or hanged.	
Ribbed	Shaped like a ribbed spheroid, with indentations. The perforation is thin and runs in the centre of the spheroid.	
Ring	Shaped like a ring, with a large perforation in the centre. The section is mostly rounded and thick.	
Segmented	Made of several joining rounded segments. The perforation runs longitudinally.	
Spherical	Shaped like a spheroid. The perforation is thin and runs in the centre of the spheroid.	

Table 1: Descriptions and outlines of the main types of beads. The shapes are the author's own drawings or are drawn after Engelbach and Gunn 1923.

THE LATE MIDDLE KINGDOM

Concerning the contexts of the Late Middle Kingdom²⁶ with beads (Table 7 in Appendix I; Appendix VI), Harageh²⁷ accounts for nearly half of the contexts and is the site with the higher variety of types of beads. It is not surprising, considering that the area where the site is located was also the area of the capital during the Middle Kingdom.²⁸ Also in Lisht²⁹ and Lahun,³⁰ which are

26 For an overview of the beads during the entire Middle Kingdom: Xia 2014, 103–10.

27 Engelbach and Gunn 1923, 9–13 and pls. L–LIII; Grajetzki 2004.

28 Agut and Moreno-García 2016, 249–53; Grajetzki 2004; Quirke 2005.

29 Kemp, Merrillees, and Edel 1980, 220–25; Lansing 1920; Lansing 1924; Lansing 1933a; Lansing 1933b; Lansing and Hayes 1934; Merrillees 1973, 55.

30 Brunton 1920, 12–17, 22–41; Petrie, Brunton, and Murray 1923, 13–15, pls. XLVIII and

both located in the same area, large cemeteries of the same period have been uncovered, but fewer tombs with beads have been reported and completely described in the publications.

The contexts are virtually all non-royal tombs. These are the contexts found also in Ballas,³¹ El-Kab,³² and Rifeh,³³ though the exact quantity of tomb with beads cannot be known from the publications. The few royal tombs included in this analysis are located mostly in Dahshur,³⁴ where beads come also from non-royal tombs,³⁵ as well as in Lahun³⁶ and Hawara;³⁷ all these sites were located in the Memphis-Fayyum area, which was the area of the capital of that time.³⁸ Nevertheless, these tombs have yielded the greatest variety, proportionally speaking, of types of beads. That is to say that the average number of types found in each burial at these sites is greater than at the other sites. A great variety of types is visible also in the Theban area,³⁹ Armant,⁴⁰ and Esna.⁴¹

The number of settlement contexts examined in this chapter is like the one of the royal burials. These contexts have been excavated at Tod,⁴² Elephantine,⁴³ and Ain Asil.⁴⁴ Beads have been found also in the large settlement at Lahun,⁴⁵ but, apart from one foundation deposit for a temple, the publications do not indicate the precise contexts of provenance of most of the beads. For this reason, Lahun has been included also in the group of sites for which the number of contexts is not known.

Finally, it is noteworthy that the beads analysed from Tell el-Dab'a,⁴⁶ which also show a great variety of types and is also known to be an important settle-

LXIII; Winlock 1934, 22, 30–41.

31 Petrie, Quibell, and Spurrell 1896, 2, 8.

32 Quibell, Clarke, and Tylor 1898, 15.

33 Petrie, Thompson, and Crum 1907.

34 Di. Arnold 1996; De Morgan, Legrain, and Jéquier 1903, 48–68, 74; De Morgan et al. 1895, 61–68, 91–114; Oppenheim 1996.

35 Baba and Yazawa 2015.

36 Brunton 1920, 12–17 and 22–41; Petrie, Brunton, and Murray 1923, 13–15, pls. XLVIII and LXIII; Petrie, Griffith, and Newberry 1890, 22; Winlock 1934, 22, 30–31, 34, 37, 41.

37 Farağ and Iskandar 1971, 34–40; Petrie, Wainwright, and Mackay 1912, 35–36.

38 Agut and Moreno-García 2016, 249–53.

39 Anthes 1943, 10–12.

40 Mond and Myers 1937.

41 Downes, 1974, 7–8, 50–55 and Tomb catalogue.

42 Pierrat et al. 1995.

43 Von Pilgrim 1996, 320.

44 Aufrère and Ballet 1990, 10–13; Marchand, Soukiassian, and Bourriau 2010, 301–4.

45 Gallorini 1998; Petrie et al. 1891, 5–15; Petrie, Griffith, and Newberry 1890, 22–32; Quirke 2005.

46 Bietak, Mlinar, and Schwab 1991, 33; Forstner-Müller 2008, 129–40; Schiestl 2009.



From all the mentioned sites, as well as from the contexts excavated in Qau el-Kebir,⁴⁸ Abydos,⁴⁹ Riqqeh,⁵⁰ Matmar,⁵¹ Mostagedda,⁵² Hu,⁵³ Denderah,⁵⁴ and Edfu,⁵⁵ it is possible to make some remarks about the most common types and materials concerning the beads, which can be seen also in the two-mode graph (Figure 1). The types of beads most common in the contexts of the Late

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Middle Kingdom include the spherical, the cylindrical, and the barrel beads. Moreover, the piriform, the ribbed, the lentil, the ring, and the disc beads are also among the more common. Lastly, the hawk-shaped and the axle barrel-shaped beads are also common.

At the same time, the materials most used to produce beads are faience and, among the stones, amethyst, carnelian, feldspar, garnet, and lapis lazuli; other stones used for the beads include agate, haematite, limestone, steatite, jasper, quartz, turquoise and, rarely, serpentine, siltstone, basalt, and diorite. It can be also noticed that the faience is usually as common or slightly more common than the stones. Nevertheless, metals such as gold, which is the most common, silver, copper, and electrum are used to produce beads during the Late Middle Kingdom. Lastly, beads of shell, mostly ring and disc beads, and bone are found at various sites.

The first one-mode graph

From a general look at the first one-mode graph (Figures 2–5), it appears that nearly all the sites are connected. It can be noticed that the group formed by Mostagedda, Denderah, and Tod is not strongly connected to the group formed by Tell el-Dab'a, Hawara, and Ain Asil. From the analysis of the centrality measures (Tables 25, 38, 51, 64 in Appendix II), it appears that for the closeness centrality the scale is very low, therefore no real difference can be detected between the sites.

As far as the other scores are concerned, it appears that a group of sites are in the very high or high rank for the degree and the eigenvector centrality. This means that they were the best linked, namely that they were strongly connected to many sites and were also well connected to the sites most important in the network of beads. They include Lahun, Dahshur, Harageh, and Abydos. Qau el-Kebir and Esna follow a similar pattern, but they score in the middle range for the degree centrality and in the high range for the eigenvector centrality. Therefore, they are characterized mostly by good connections with the major players of the network of beads. On the other side, Ain Asil, Tod, and Ballas have very high betweenness and closeness centrality. This means that these sites were intermediaries in the network of beads.

Lastly, Tell el-Dab'a, Lisht, Hawara, Rifeh, Riqqeh, Matmar, Mostagedda, Hu, Denderah, the Theban area, Armant, El-Kab, Edfu, and Elephantine do not display any particular pattern or high scores in the network. This means that, based on the available data, they do not create strong connections.

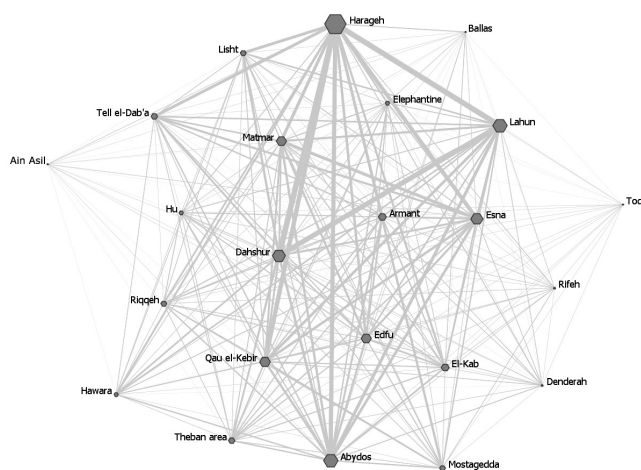


Figure 2: Degree centrality of the first one-mode graph of the beads during the LMK.

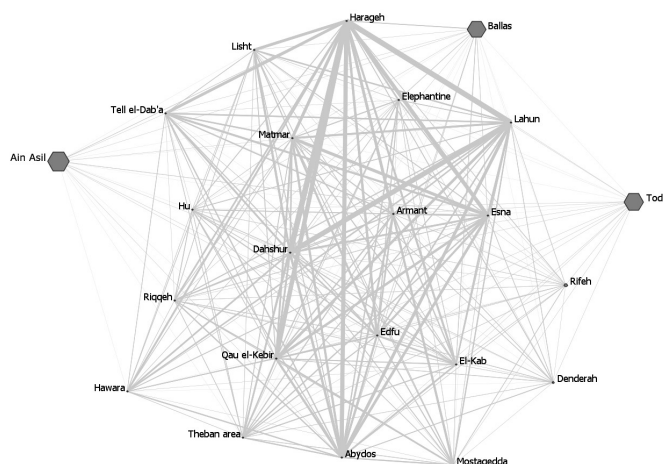


Figure 3: Betweenness centrality of the first one-mode graph of the beads during the LMK.

The one-mode graph based on the Jaccard similarity

The second one-mode graph (Figures 6–9) depicts how the sites are linked based on how similar their material culture is according to the Jaccard similarity. The overall shape of the two graphs is the same, meaning that we can be confident of its reliability. As far as the results of the centrality measures are concerned (Tables 77, 90, 103, 116 in Appendix III), a group of sites follows a pattern similar, sometimes with just small differences, to the one detected in the previous graph. These sites include Hawara, Lahun, Abydos, Esna, Ballas, Tod, and Ain Asil. In detail, Ballas, Tod, and Ain Asil still appear

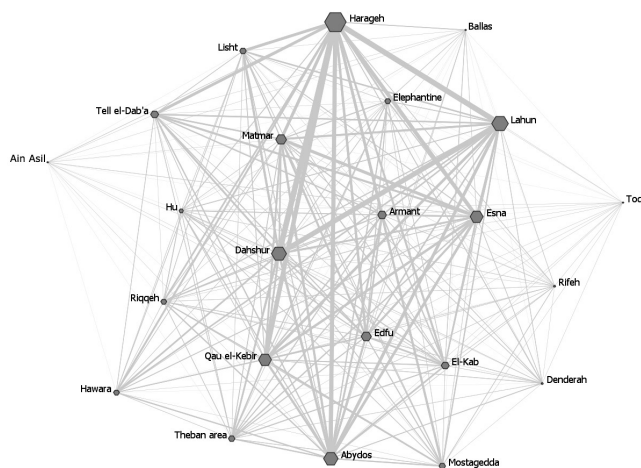


Figure 4: Eigenvector centrality of the first one-mode graph of the beads during the LMK.

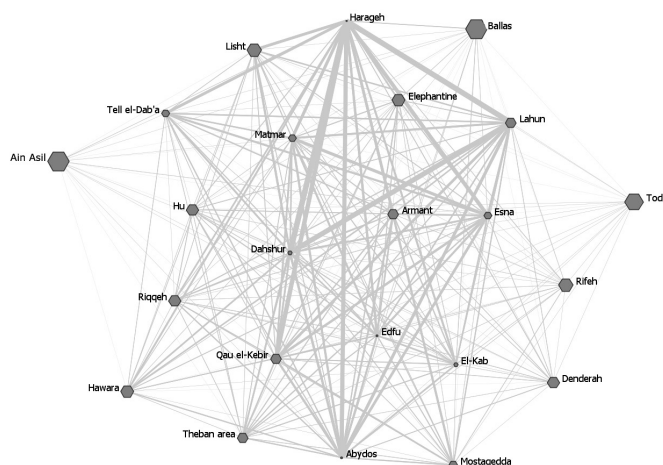


Figure 5: Closeness centrality of the first one-mode graph of the beads during the LMK.

as intermediaries, while Lahun and Abydos, and Esna on a lesser degree, still appear among the better-connected in the network of beads. Moreover, Lisht and Hawara still score between the middle and the very low ranks, implying that they created no strong connections in the network of beads.

Nevertheless, most sites follow a pattern different in the second one-mode graph. The sites of Rifeh, Riqqeh, Matmar, Mostagedda, Qau el-Kebir, Hu, Denderah, the Theban area, Armant, El-Kab, Edfu, and Elephantine appear, in the present graph, among the sites with the better connections in the network of beads, given that they rank higher in the degree centrality and the

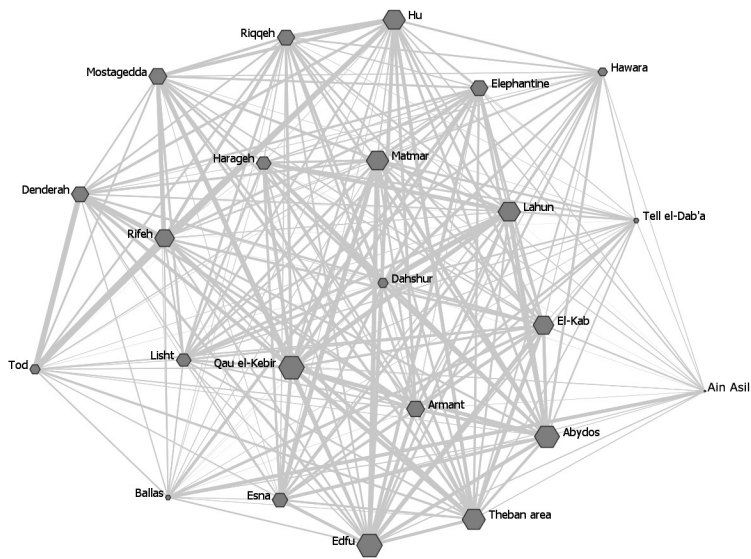


Figure 6: Degree centrality of the second one-mode graph of the beads during the LMK.

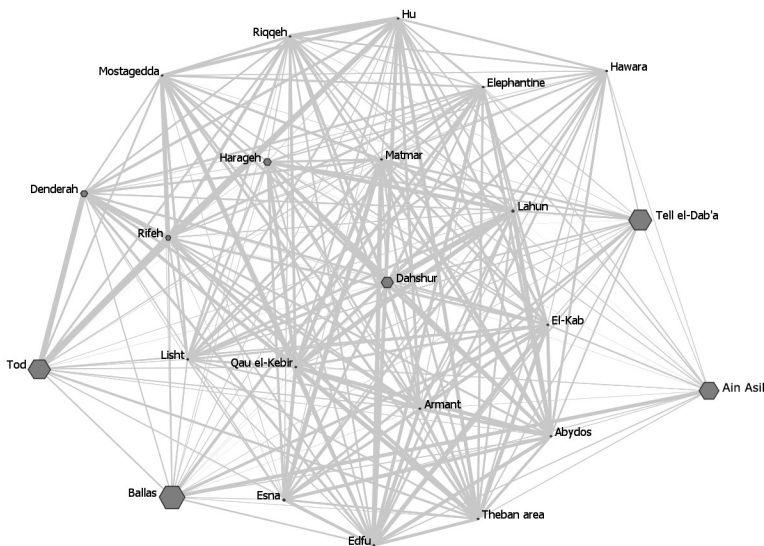


Figure 7: Betweenness centrality of the second one-mode graph of the beads during the LMK.

eigenvector centrality. Lisht also scores higher in the second graph, but not higher than the middle range. It can be also noticed that Rifeh scores high for the closeness centrality, like in the previous graph, meaning that it was easily reached by the other sites in the network.

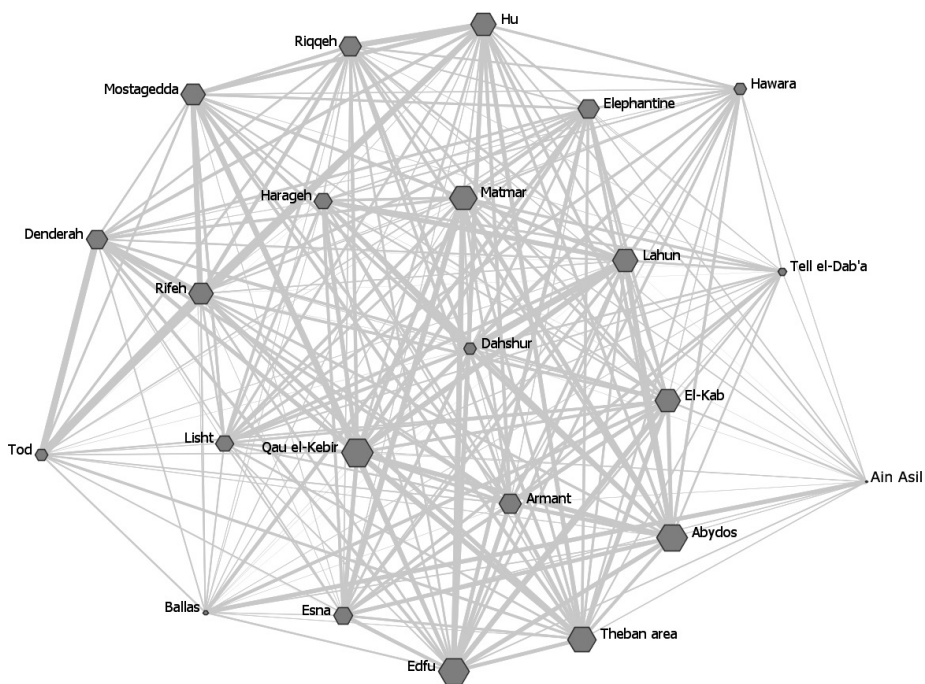


Figure 8: Eigenvector centrality of the second one-mode graph of the beads during the LMK.

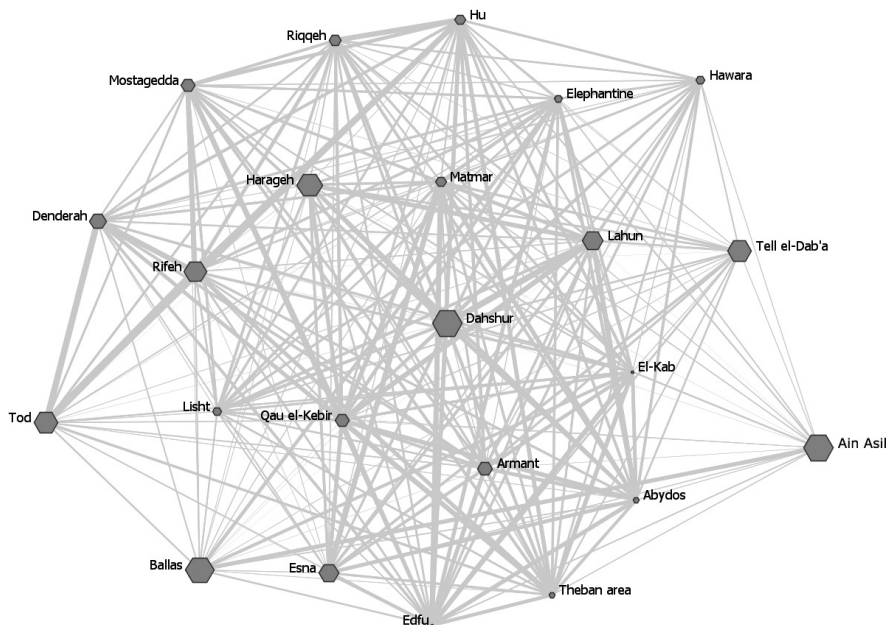


Figure 9: Closeness centrality of the second one-mode graph of the beads during the LMK.

All this means that, when the full range of beads is considered, all the mentioned sites acquire more importance: this derives from the fact that, although all these sites had part of their range of beads in common, this part did not involve many of the most common types. On the contrary, in the second one-mode graph Harageh and Dahshur look less important in the network of beads, compared to the previous graph. They only score in the high rank for the closeness centrality, suggesting that they were among the sites that could be reached more easily in the network of beads. These results come from the fact that all these sites mostly had in common very widespread types of beads, thus their importance diminishes when the full range is considered, and the common types have less influence on the analysis.

Lastly, Tell el-Dab'a appears like an intermediary, with a high betweenness and a high closeness centrality. The scores of this site have a different pattern, compared to the previous graph. This situation derives from the range of types shared with the other sites, and how it included the most common types.

Summary

A group of sites appear to be the better-connected sites and the major players in the network of beads during the Late Middle Kingdom. They include Lahun and Abydos, and, when only the shared beads are considered, Harageh and Dahshur. This implies that these sites could be where the threads of communications were starting or ending, and where now trends could be spread from.⁵⁶ Other sites – namely Rifeh, Riqqeh, Matmar, Mostagedda, Qau el-Kebir, Hu, Denderah, the Theban area, Armant, El-Kab, Edfu and Elephantine – appear among the major players in the network of beads, thus appear more important, only when their full range of beads is considered. This implies that, while these sites have in common part of their range of beads with the other sites, the most common types were not the majority in this part.

At the same time, Ain Asil, Ballas, Tod, and, when only the full range of beads is considered, Tell el-Dab'a look like intermediaries in the network of beads, thus as passageways or (re)distribution centres. This means that these could be the sites where the beads were channelled through or were (re)distributed from.⁵⁷ Similarities in the pottery between the sites in the Dakhla Oasis and other sites in Egypt⁵⁸ also suggest that the site was used as a passageway for the trade going over land, through the desert.

56 Östborn and Gerding 2015.

57 Gjesfeld 2015; Rivers, Knappett, and Evans 2013.

58 Marchand, Soukiasian, and Bourriau 2010, 139–41.

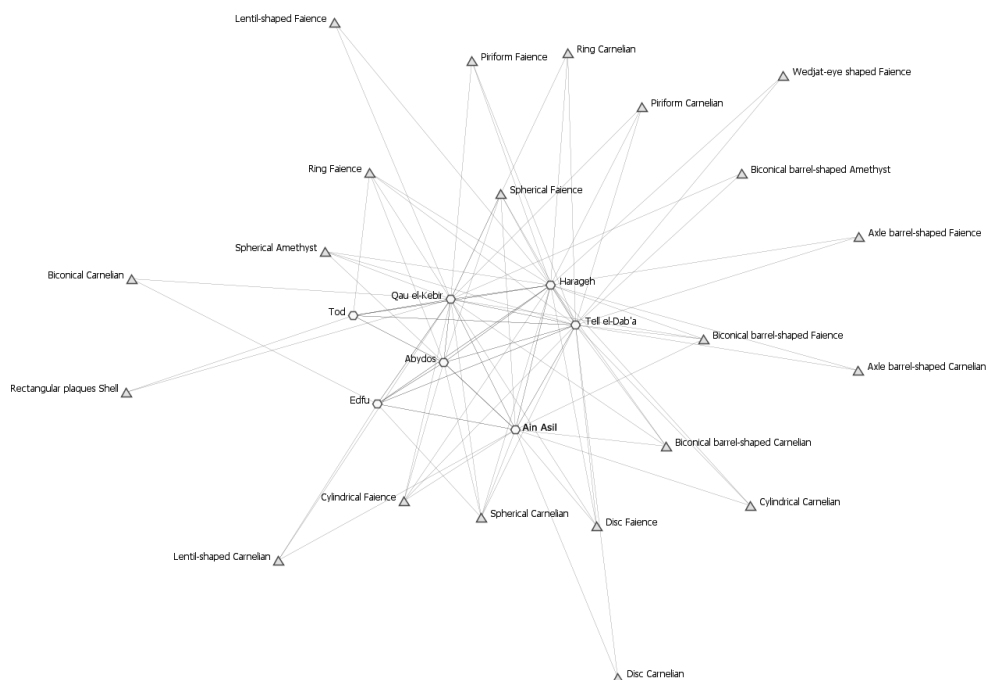


Figure 10: Contexts of the Early Second Intermediate Period and the most common beads.

THE EARLY SECOND INTERMEDIATE PERIOD

The number of sites and contexts with beads included in the analysis (Table 13 in Appendix I; Appendix VII) conspicuously shrinks for the Early Second Intermediate Period.⁵⁹ Furthermore, it can be seen that all the sites examined for the Early Second Intermediate Period are sites that were already inhabited during the Late Middle Kingdom.

Among these sites, Qau el-Kebir⁶⁰ is where the most contexts of the Early Second Intermediate Period with beads have been excavated: nearly half of the total number of contexts examined in the present section. Successively, Tell el-Dab'a⁶¹ and Harageh⁶² are the sites with more contexts included in the analysis. The remaining sites have yielded very few contexts with beads for the Early Second Intermediate Period.

Like in the Late Middle Kingdom, also in the Early Second Intermediate Period the contexts are nearly always burials, and the only settlement contexts that could be included in the analysis come from Ain Asil.⁶³ Moreover, as

59 For an overview of the beads during the entire Second Intermediate Period: Xia 2014, III–15.

60 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. V–VIII, XI, XXVI–XXV, XXXII.

61 Bietak, Mlinar, and Schwab 1991, 66, 71, 85–86; Forstner-Müller 2008, 140–217; S.E.M. Müller 2013, 124–26.

62 Engelbach and Gunn 1923, 14–16, pls. L–LIII and LVIII–LXII.

63 Marchand, Soukiassian, and Bourriau 2010, 301–4 and 308.

remarked also for the Late Middle Kingdom, for Tell el-Dab'a, despite its importance as a settlement,⁶⁴ only burial contexts could be part of the analysis, because data from other types of contexts are not available yet.

As far as the types and materials of the beads are concerned, they are summarized in the two-mode graph (Figure 10). From this, the most varied range of beads, when compared to the number of contexts they come from, is found in Tell el-Dab'a⁶⁵ and Harageh.⁶⁶ Moreover, the most common beads in the contexts of the Early Second Intermediate Period include the types already common in the Late Middle Kingdom, namely the spherical and the cylindrical ones. Nevertheless, there are two more types that are among the most common during the Early Second Intermediate Period, but that were less common in the Late Middle Kingdom: the disc and the ring beads. The barrel, the piriform, and the axle barrel-shaped beads are still used, but less than in the Late Middle Kingdom.

Concerning the material used for the beads, the faience is, contrarily to the Late Middle Kingdom, predominantly more used than the stones, which include mostly carnelian, amethyst, and, rarely, turquoise and lapis lazuli; gold is virtually absent. Moreover, Tell el-Dab'a⁶⁷ is noticeable because it is the only site where beads of gold have been found. Lastly, Tod⁶⁸ and Qau el-Kebir⁶⁹ are the only sites where beads of bone and shell were used. This could be connected to the fact that the beads come from known Pan-grave tombs, thus from tombs of people of Nubian origins, who were using material more common in their culture.⁷⁰

Lastly, It should be mentioned that Abydos⁷¹ and Qau el-Kebir⁷² have yielded more burials of the Second Intermediate Period with beads. Moreover, at the sites of Mostagedda,⁷³ Hu,⁷⁴ and Esna,⁷⁵ burials of the Second Intermediate Period with beads have been excavated. However, all these burials have only generically been dated to Second Intermediate Period or, as in the case of

64 Bietak 1996; Bietak 1997.

65 Bietak, Mlinar, and Schwab 1991, 66, 71, 85–86; Forstner-Müller 2008, 140–217; S.E.M. Müller 2013, 124–26.

66 Engelbach and Gunn 1923, 14–16, pls. L–LIII and LVIII–LXII.

67 Forstner-Müller 2008, 140–91.

68 Barguet 1952.

69 Brunton, Gardiner, and Petrie 1930, 3–11 and pls. V–VIII, XI, XXIV–XXV, XXXII.

70 Barguet 1952.

71 Garstang, Newberry, and Milte 1901; Peet 1914; Randall-MacIver, Mace, and Griffith 1902.

72 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. V–VIII, XI, XXIV–XXV.

73 Brunton and Morant 1937, 114–22 and 125–26, pls. LXVIII–LXXII.

74 Bourriau 2009, 52–90; Petrie and Mace 1901, 45–53.

75 Downes 1974, 9–10, 50–55 and Tomb catalogue.

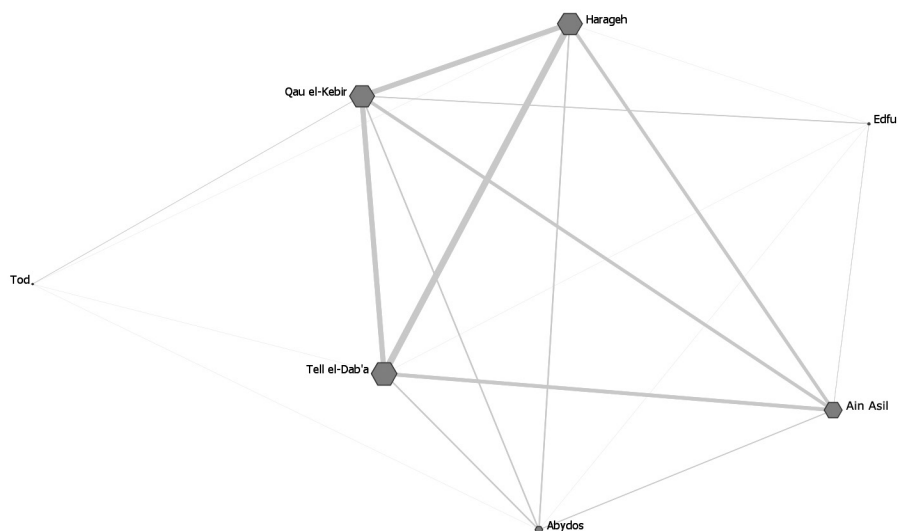


Figure 11: Degree centrality of the first one-mode graph of the beads during the ESIP.

Mostagedda and Hu,⁷⁶ they have been dated to the Late Second Intermediate Period. Therefore, all the beads from these tombs could not be included in the analysis. However, from the beads retrieved in these undated tombs, the common types and the materials used in the production of beads are mostly the same one already noted. Some additions, like the segmented beads and the rectangular plaques, as well as the more extensive use of shell and bone, are noteworthy because they seem to be connected to sites with Pan-grave tombs.

The first one-mode graph

In the first one-mode graph (Figures 11–14), stronger connections are visible between Tell el-Dab'a, Harageh, Ain Asil, and Qau el-Kebir. This suggests that Tell el-Dab'a was in contact with Middle Egypt through the Fayyum and the desert route, as proposed also by other research⁷⁷ and will be further elaborated on in the conclusions. Moreover, the sites in southern Upper Egypt seem to be more in contact with the sites in Middle Egypt and, through them, with the sites in Lower Egypt, than between themselves. It can be noticed that even the sites of Edfu and Tod, which are located near each other, do not share similar types of beads. However, this could be an effect of the small size of the

⁷⁶ Williams 1975, 194–99 and 212–16.

⁷⁷ Agut and Moreno-García 2016, 292–94.

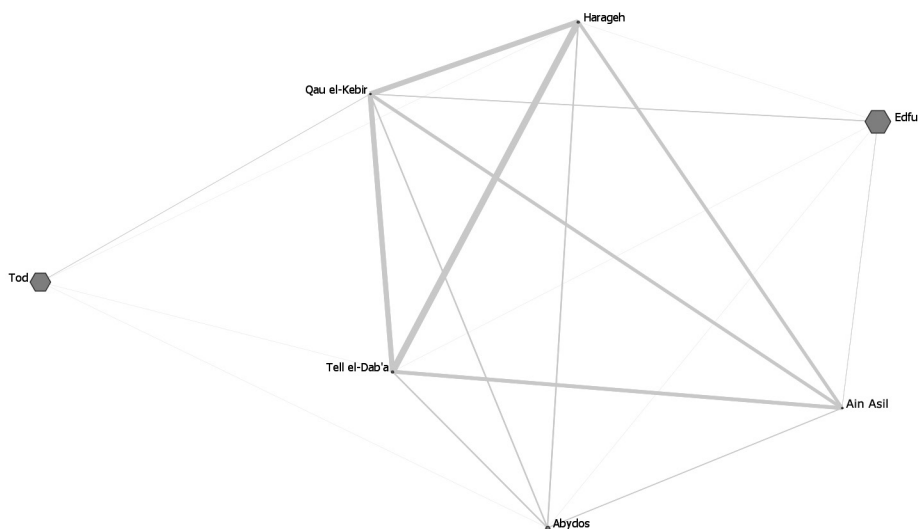


Figure 12: Betweenness centrality of the first one-mode graph of the beads during the ESIP.

sample from Tod. All in all, the contacts seem to be more oriented towards Lower Egypt.

From the analysis of the centrality measures (Tables 30, 43, 56, 69 in Appendix II), it appears that Tell el-Dab'a, Harageh, Ain Asil, and Qau el-Kebir score in the very high or high ranks for the degree centrality and for the eigenvector centrality. Therefore, they appear to be the better-connected in the network of beads: this means that they have the highest number of connections and are linked to the major players of the network. Furthermore, it can be noticed that Tell el-Dab'a and Harageh have a high closeness centrality, meaning that they were easily reachable through the connections established in the network. On the other side, Edfu and Tod score in the very high rank for the betweenness centrality and closeness centrality, which suggest that they were intermediaries in the network of beads.

Lastly, the scores of Abydos suggest that it could be easily reached by the other sites in the network of beads.

The one-mode graph based on the Jaccard similarity

The structure of the network based on the Jaccard similarity (Figures 15–18) is the same as the one detected in the previous graph. This shows that the structure does not change, whether only the shared beads or the full range of beads is considered. As far as the centrality measures are concerned (Tables 82, 95, 108, 121 in Appendix III), most of the sites, namely Tell el-Dab'a, Harageh,

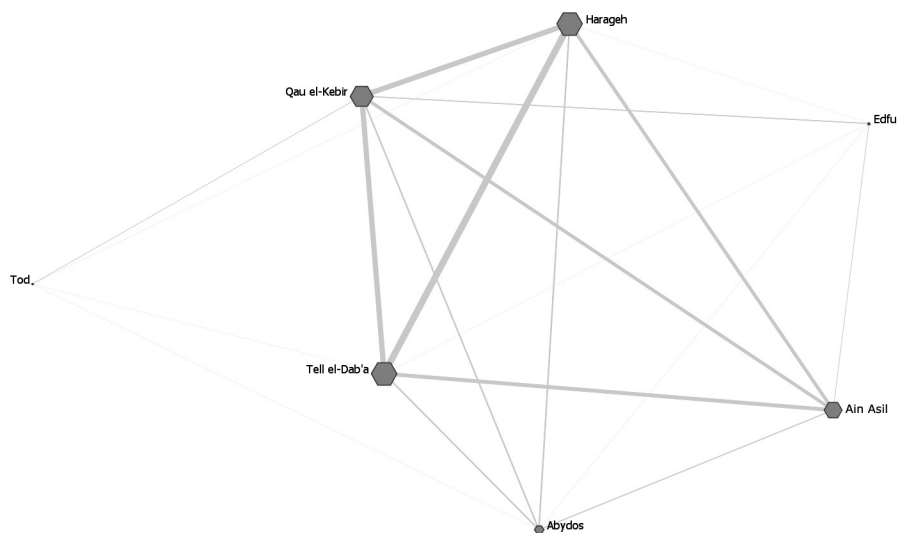


Figure 13: Eigenvector centrality of the first one-mode graph of the beads during the ESIP.

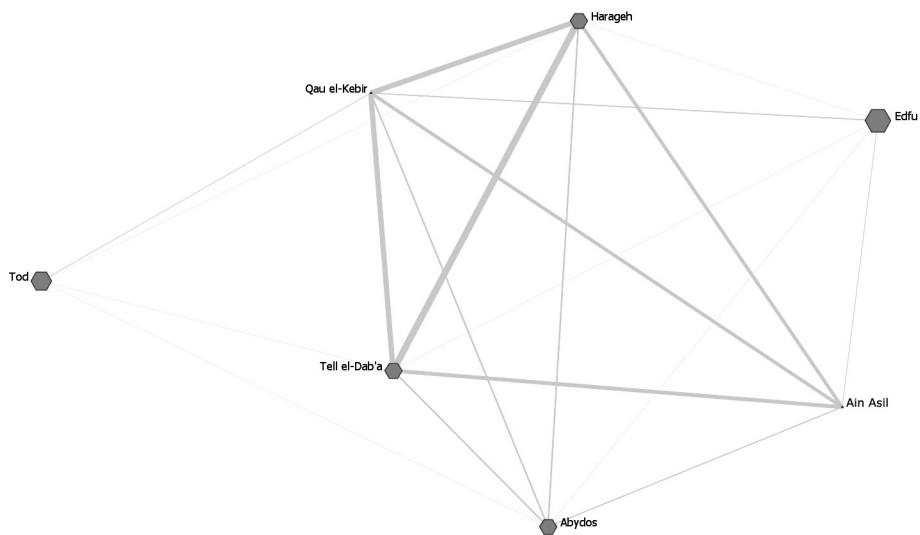


Figure 14: Closeness centrality of the first one-mode graph of the beads during the ESIP.

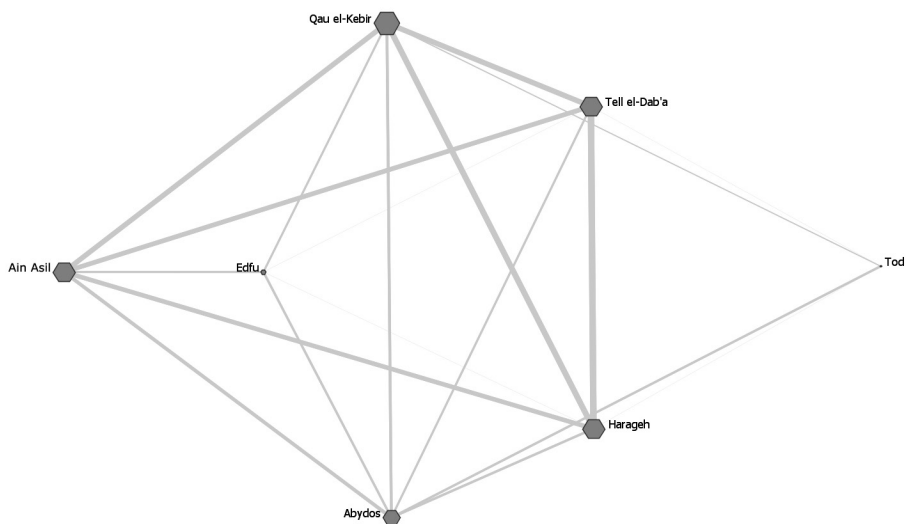


Figure 15: Degree centrality of the second one-mode graph of the beads during the ESIP.

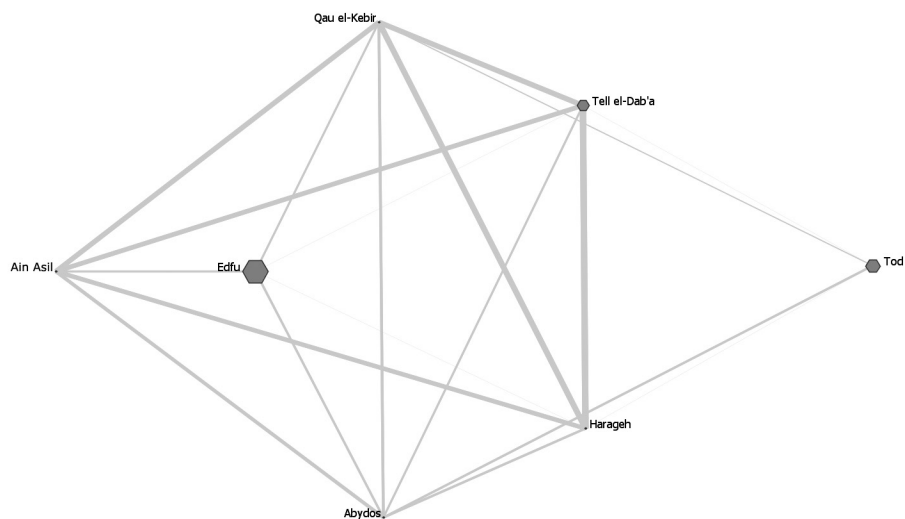


Figure 16: Betweenness centrality of the second one-mode graph of the beads during the ESIP.

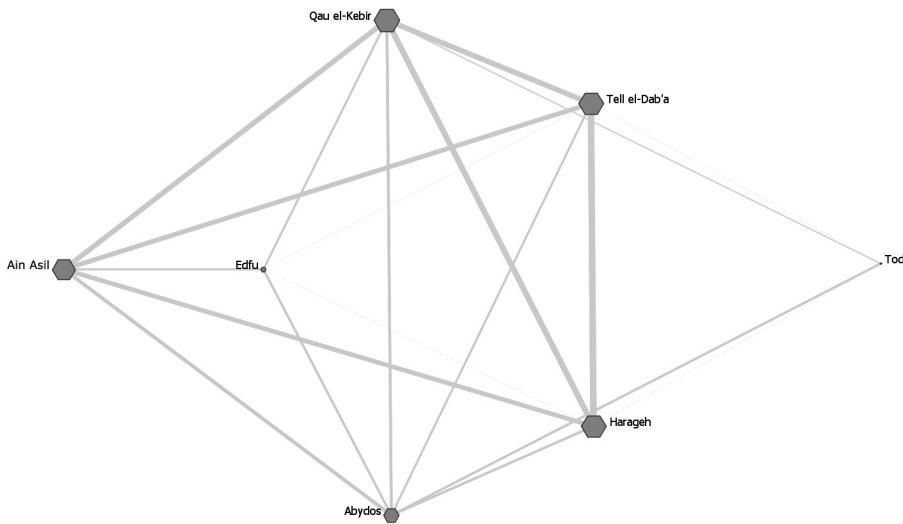


Figure 17: Eigenvector centrality of the second one-mode graph of the beads during the ESIP.

Qau el-Kebir, Edfu, and Ain Asil, score in similar ranks in both graphs, with minor changes that do not affect the overall pattern. Hence, Edfu still appears as intermediary in the network of beads, while the other sites mentioned appear the better connected, and Tell el-Dab'a and Harageh still have a high accessibility. Furthermore, Tod still has a very high closeness centrality, meaning that it was one of the most accessible sites in the network of beads.

Lastly, in the second one-mode graph Abydos scores in the high rank for both the degree centrality and the eigenvector centrality. Therefore, the site appears to be more important in the network of beads when its full range is considered. This comes from the fact that the site had in common part of its range of beads, though not many of the most common types.

Summary

During the Early Second Intermediate Period, Tell el-Dab'a, Harageh, Qau el-Kebir, and Ain Asil seem to be major players in the network of beads. They were probably the initial senders or the final receivers in the lines of communications, and where new trends could also start.⁷⁸ For Ain Asil, the excavations show a settlement that during the Early Second Intermediate Period had economic importance, was playing an important role in the communications between the Hyksos and Nubia, and was in contact with the people of the Pan-grave culture as well.⁷⁹

⁷⁸ Östborn and Gerding 2015.

⁷⁹ Baud 1997; Marchand, Soukiassian, and Bourriau 2010, 139–43.

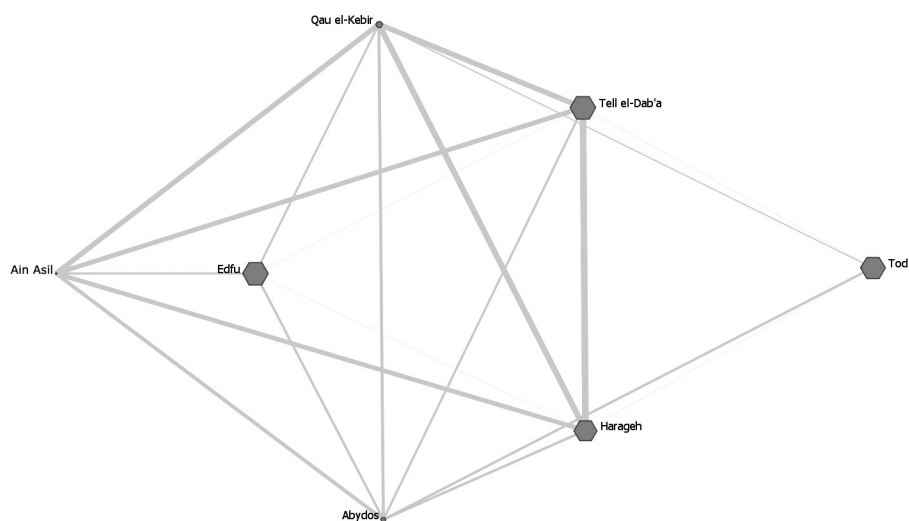


Figure 18: Closeness centrality of the second one-mode graph of the beads during the ESIP.

At the same time, Edfu, and possibly Tod, appear to have been intermediaries, hence passageways or (re)distribution centres in the network of beads, thus where the beads would pass by or be (re)distributed from.⁸⁰ Archaeological finds, mostly pottery, sealings, and stelae, demonstrate that Edfu not only was still inhabited in the Early Second Intermediate Period, but playing an important part in the communications between Lower and Upper Egypt.⁸¹ For Tod, the types of beads and materials shared with the other sites connect it mostly with the other Pan-Grave sites, suggesting that it played a role in the network of Pan-grave communities.

Abydos also looks more important in the network of beads when the full range of beads is considered, because the types that it shared with the other sites did not involve many of the most common ones. From other sources, especially stelae, we know that the site had its importance during the period, and that Asiatics of middle and higher ranks were active there.⁸²

THE LATE SECOND INTERMEDIATE PERIOD

The number of sites with beads included in the analysis of this phase (Table 19 in Appendix I; Appendix VIII) is larger, in comparison with the previous phase.⁸³ Sites are included that appear for the first time in the analysis (i.e.

80 Gjesfeld 2015; Rivers, Knappett, and Evans 2013.

81 Ayers 2018; El-Sayed 1979; Moeller 2010; Moeller, Marouard, and Ayers 2011.

82 Mourad 2013.

83 For an overview of the beads during the entire Second Intermediate Period: Xia 2014,

Matmar,⁹² Mostagedda,⁹³ Qau el-Kebir,⁹⁴ the Theban area,⁹⁵ Elephantine,⁹⁶ Lisht,⁹⁷ Deir el-Ballas,⁹⁸ and Hu).⁹⁹ Lastly, in the analysis of this phase a group of sites has been included, for which the precise number of contexts is not known, while the type of contexts is known: these sites include Lisht,¹⁰⁰ Deir el-Ballas,¹⁰¹ Hu,¹⁰² and the Theban area.¹⁰³

Tell el-Dab'a,¹⁰⁴ Sedment,¹⁰⁵ Mostagedda,¹⁰⁶ and Balabish¹⁰⁷ are the sites that contribute the higher number of contexts with beads for the Late Second Intermediate Period. As mentioned for the Early Second Intermediate Period, Abydos,¹⁰⁸ Qau el-Kebir,¹⁰⁹ and Esna¹¹⁰ have yielded many more burials of the Second Intermediate Period with beads, than the ones reported. However, these burials could not be used for the analysis because they have not been more precisely dated. As remarked for the previous two phases, in the Late Second Intermediate Period nearly all the beads come from burial contexts. Only Tell el-Dab'a,¹¹¹ with the majority, Elephantine,¹¹² Deir el-Ballas,¹¹³ and Tell Hebua¹¹⁴ have yielded beads from settlement contexts.

- 92 Brunton 1948, 56–58, pls. XLIV and LXXIII.
- 93 Brunton and Morant 1937, 114–22 and 125–26, pls. LXVIII–LXXII.
- 94 Brunton, Gardiner, and Petrie 1930, 3–10, pls. V–VIII, XI, XXIV–XXV, XXXII.
- 95 Petrie and Walker 1909, 8–10; Tate et al. 2009; Troalen et al. 2009.
- 96 Von Pilgrim 1996, 320.
- 97 Hayes 1959, 12–13.
- 98 Bourriau 1990, 24.
- 99 Petrie and Mace 1901, 46, 51, 53.
- 100 Hayes 1959, 12–13.
- 101 Bourriau 1990, 24.
- 102 Petrie and Mace 1901, 46, 51, 53.
- 103 Hayes 1959, 20–21.
- 104 Aston, Bader, and Kunst 2009, 67–68; Bietak and Forstner-Müller 2006; Bietak, Mlinar, and Schwab 1991, 116–281; Forstner-Müller 2008, 221–384; Forstner-Müller 2015; Forstner-Müller et al. 2015; Hein, Jánosi, and Kopetzky 2004, 34–48, 100–49.
- 105 Petrie and Brunton 1924, 16–20 and pls. XLVI–XLVIII.
- 106 Brunton and Morant 1937, 114–22 and 125–26, pls. LXVIII–LXXII.
- 107 Wainwright and Whittemore 1920, 8–16 and 19–23, pls. VIII and XVI–XVII.
- 108 Bourriau 1981a, 34; Garstang, Newberry, and Milte 1901; Peet 1914, 62–64; Randall-MacIver, Mace, and Griffith 1902, 101.
- 109 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. V–VIII.
- 110 Downes 1974, 9–10, 50–55 and Tomb catalogue.
- 111 Aston, Bader, and Kunst 2009, 67–68; Bietak and Forstner-Müller 2006; Bietak, Mlinar, and Schwab 1991, 116–281; Forstner-Müller 2015; Forstner-Müller et al. 2015; Hein, Jánosi, and Kopetzky 2004, 34–48, 100–49.
- 112 Von Pilgrim 1996, 320.
- 113 Bourriau 1990, 24.
- 114 Maksoud 1998, 261.

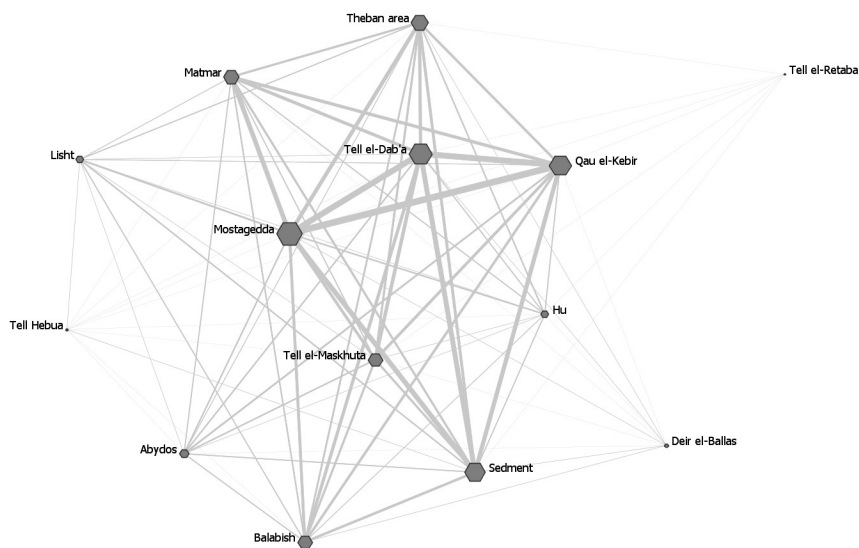


Figure 20: Degree centrality of the first one-mode graph of the beads during the LSIP.

As far as the types of beads are concerned, they can be seen in Figure 19. All in all, it seems that Tell el-Dab'a,¹¹⁵ Qau el-Kebir,¹¹⁶ and the Theban area¹¹⁷ have the most variety of types, when the proportion between the number of contexts and the types of beads is considered. On the contrary, Mostagedda¹¹⁸ and Balabish¹¹⁹ have a narrower range of beads. Furthermore, it can be noticed that the spherical beads are the most common types, followed by the ring and the disc beads at half of the sites examined for the period. These three types were the most popular also during the Early Second Intermediate Period and continue to be very popular during the Late Second Intermediate Period. The barrel and the cylindrical beads are also common, but less than in the previous phases. Lastly, the piriform and the lentil beads are common, though less than the other types mentioned.

Concerning the materials used to produce the beads, faience, mostly of blue colour, is the most common material, even on sites where also stone and metal beads are found. Among the stones used to make beads, amethyst and carnelian are still the most popular ones, even more than in the previous

- 115 Aston, Bader, and Kunst 2009, 67–68; Bietak and Forstner-Müller 2006; Bietak, Mlinar, and Schwab 1991, 116–281; Forstner-Müller 2008, 221–384; 2015; Forstner-Müller et al. 2015; Hein, Jánosi, and Kopetzky 2004, 34–48, 100–49.
- 116 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. V–VIII, XI, XXIV–XXV, XXXII.
- 117 Petrie and Walker 1909, 8–10; Tate et al. 2009; Troalen et al. 2009.
- 118 Brunton and Morant 1937, 114–22 and 125–26, pls. LXVIII–LXXII.
- 119 Wainwright and Whitemore 1920, 8–16 and 19–23, pls. VIII and XVI–XVII.

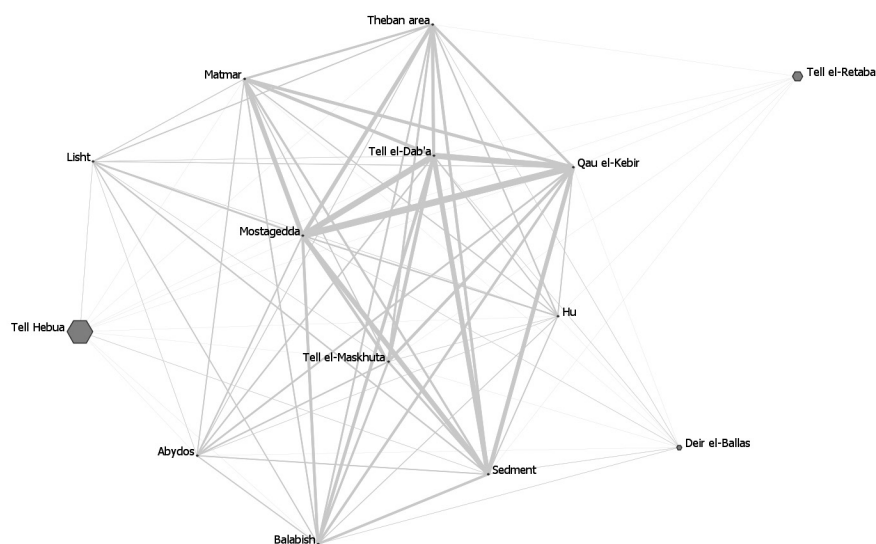


Figure 21: Betweenness centrality of the first one-mode graph of the beads during the LSIP.

phases. Other stones used, less commonly, for beads in the Late Second Intermediate Period include garnet, steatite, feldspar and, more rarely, serpentine, quartz, haematite, agate, limestone, basalt, lapis lazuli, and turquoise. Lastly, beads of gold, silver, shell, and bone are also found in this phase.

It should also be mentioned that the results for Tarkhan,¹²⁰ Elephantine,¹²¹ and Tell el-Retaba¹²² are based on a single bead found at each site, therefore they are reported only for sake of completeness and need to be taken with the due caution, awaiting the analysis of other material.

The first one-mode graph

The first one-mode graph (Figures 20–23) shows that the sites in Lower Egypt are connected to the ones in southern Upper Egypt especially through Sedment, and through other sites in Middle Egypt such as Matmar, Mostagedda, Qau el-Kebir. Also Tell el-Dab'a and the Theban area are strongly connected, though the stronger contacts appear to involve the sites in southern Upper Egypt. From the analysis of the centrality measures (Tables 32, 45, 58, 71 in Appendix II), it appears that the closeness centrality is nearly the same for all the sites analysed. This means that all the sites had the same accessibility in the network of beads.

120 Petrie 1914, 12.

121 Von Pilgrim 1996, 320.

122 Rzepka et al. 2014, 39–46.

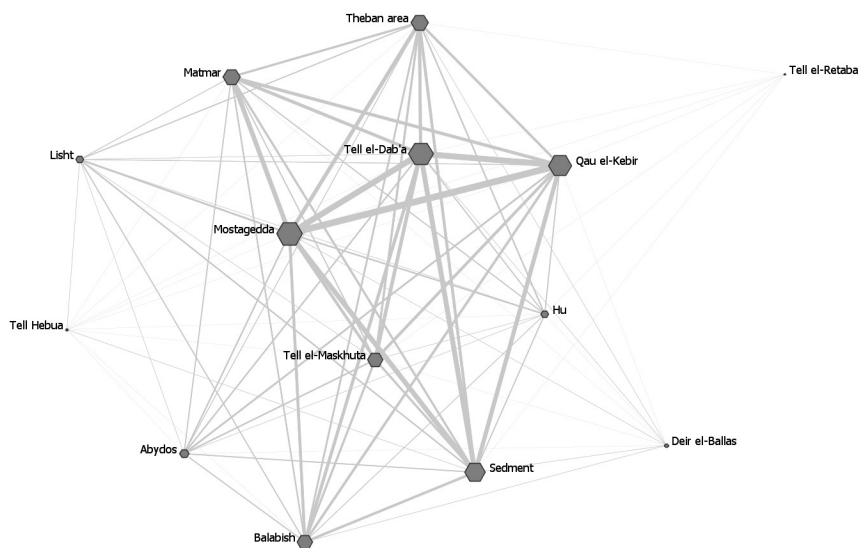


Figure 22: Eigenvector centrality of the first one-mode graph of the beads during the LSIP.

Half of the sites examined show a similar pattern, namely a high or very high score for the degree centrality and the eigenvector centrality. This suggests that the sites were the better connected in the network of beads, meaning that they had many connections and had good contacts with the major players. These sites include Tell el-Dab'a, Sedment, Mostagedda, Qau el-Kabir, and the Theban area. Also Tell el-Maskhuta, Matmar, and Balabish have a similar pattern, but they score in the middle rank for the degree centrality and for the eigenvector centrality, suggesting that they had a less prominent role in the network of beads, but they were well connected to the major players. At the same time, Tell Hebua has the pattern of an intermediary, with a very high score for the betweenness centrality. Moreover, Tell el-Retaba scores in the middle rank for the betweenness centrality, meaning that it could be an intermediary in the network of beads, but with a less prominent role.

Lastly, a group of sites, including Lisht, Tarkhan, Abydos, Hu, Deir el-Ballas, and Elephantine have all low or very low scores, apart from the closeness centrality. This suggests that they were easily accessible in the network of beads, but for the rest created no strong connections.

The one-mode graph based on the Jaccard similarity

For the Late Second Intermediate Period too, the structure of the network is the same in both one-mode graphs (Figures 24–27), receiving confirmation of its reliability. Concerning the centrality measures (Tables 84, 97, 110, 123

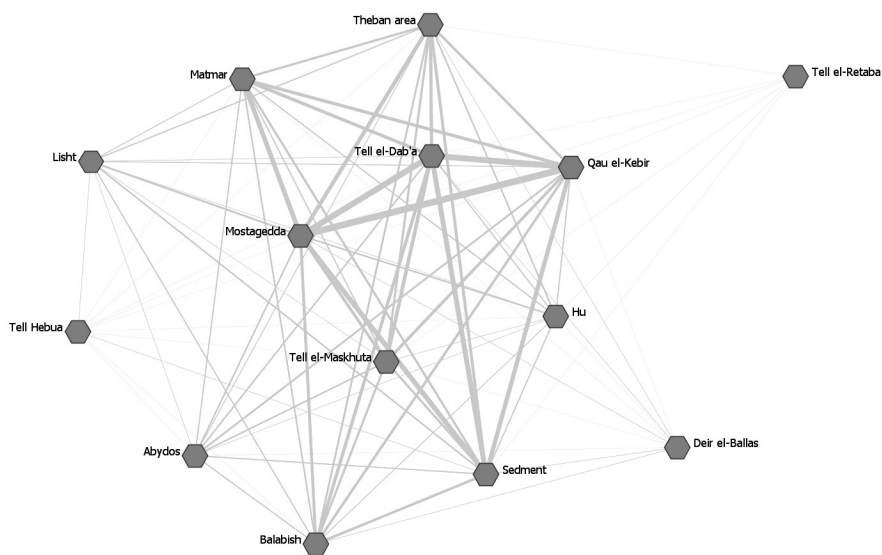


Figure 23: Closeness centrality of the first one-mode graph of the beads during the LSIP.

in Appendix III), the closeness centrality is again nearly the same for all the sites, which score all in the very high rank, with the exception of Elephantine. This confirms that all the sites had a similar accessibility in the network of beads.

A group of sites has similar scores in both two mode-graphs, sometimes with minor changes that do not alter the overall pattern. This group includes Tell el-Dab'a, Sedment, Mostagedda, Qau el-Kebir, the Theban area, and Tell Hebua. Therefore, Tell Hebua still appears as an intermediary in the network of beads, while the other sites still look like the better-connected sites in the network of beads. In addition, Tell el-Dab'a scores a high betweenness centrality. The sites of Tell el-Maskhuta, Lisht, Matmar, Balabish, Abydos, and Hu have a similar pattern in both one-mode graphs, namely higher degree centrality and eigenvector centrality. Nevertheless, their scores are much higher in the second one-mode graph, implying that they appear more important in the network when their full range of beads is considered. This situation derives from the fact that these sites have in common part of their range of beads, but not many of the most common ones.

Lastly, Tell el-Retaba, Elephantine, Tarkhan, and Deir el-Ballas have all low scores in the present graph. It should be kept in mind, however, that only very few beads from these sites have been included in the network.

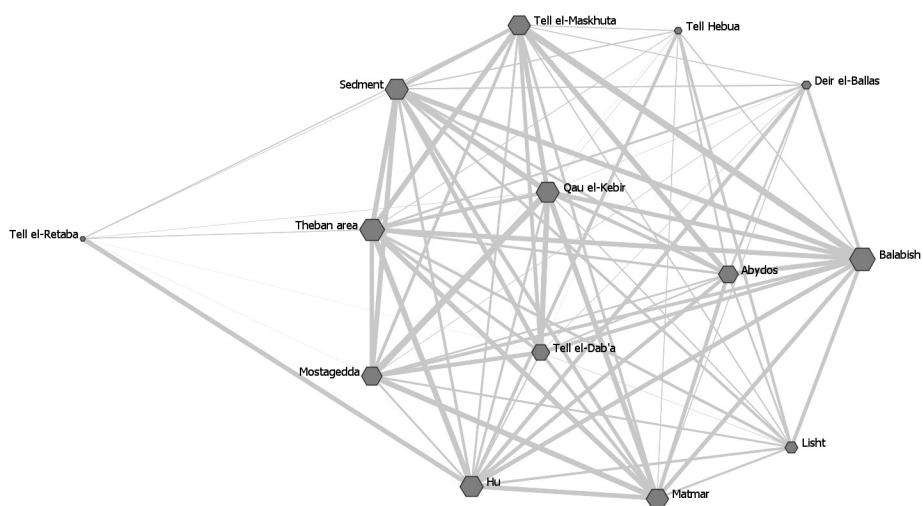


Figure 24: Degree centrality of the second one-mode graph of the beads during the LSIP.

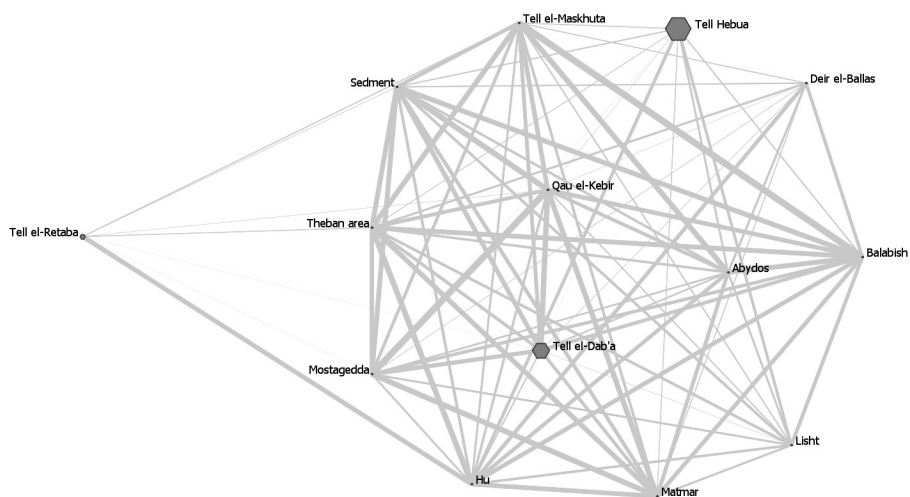


Figure 25: Betweenness centrality of the second one-mode graph of the beads during the LSIP.

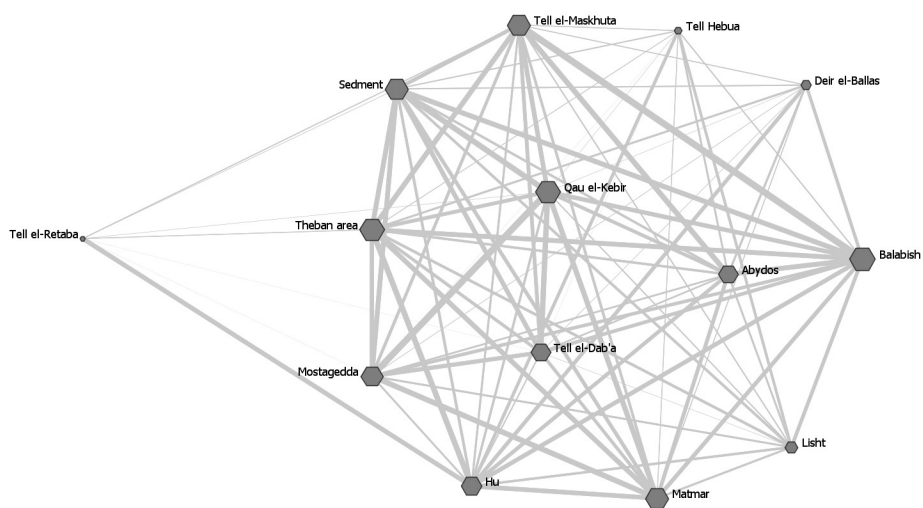


Figure 26: Eigenvector centrality of the second one-mode graph of the beads during the LSIP.

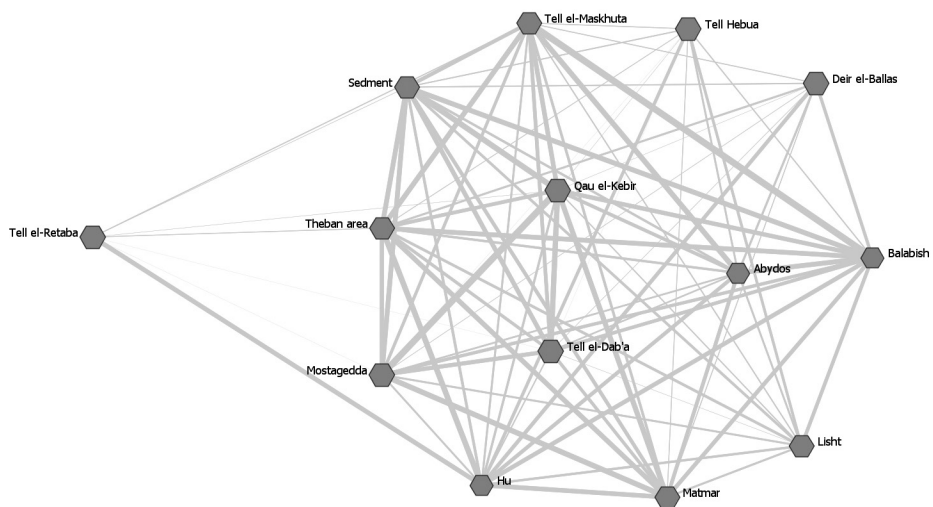


Figure 27: Closeness centrality of the second one-mode graph of the beads during the LSIP.

Summary

As regards the Late Second Intermediate Period, Tell el-Dab'a, Sedment, Mostagedda, Qau el-Kebir, and the Theban area look like the major players in the network of beads, namely the sites that could start the lines of communications in the network or new trends in material culture, or where the flow of communications was destined to.¹²³ At the same time, Tell el-Maskhuta, Lisht, Matmar, Balabish, Abydos, and Hu look important in the network of beads only when their full range of beads is considered. This is because, while they shared part of their range of beads, they did not share many of the most common types. Moreover, Tell Hebua seem to have been a passageway or (re) distribution centre in the network of beads, so a place where the beads were channelled through or (re)distributed from.¹²⁴

THE CORRESPONDENCE ANALYSIS

To understand if and how the scores discussed for the centrality measures are influenced by the variety of types retrieved at the sites, the correspondence analysis has been conducted for both one-mode graphs elaborated in the present chapter. From the results (Appendix IV) of the correspondence analysis, it appears that the sites with the largest number of types tend to have high scores for the degree centrality and the eigenvector centrality, while the betweenness centrality is not affected. Nevertheless, this is not always the case and the relationship between largest number of types and high scores for the measures is not straightforward. In other words, having a larger number of beads could mean higher scores, but not necessarily so.

The scores detected in the second one-mode graph, the one based on the Jaccard similarity, look even less dependent on the number of types found on sites. Therefore, even if the mentioned tendency and the danger of archaeological bias make it necessary for us to remain cautious, the question about an inescapable bias in the measures due to the number of objects types found on the sites can be answered mostly in the negative.

CONCLUDING REMARKS

During the Late Middle Kingdom, the major players in the network of beads appear to be Lahun, Harageh, Dahshur, and Abydos. Other probable main players are Rifeh, Riqqeh, Matmar, Mostagedda, Qau el-Kebir, Hu, Denderah, the Theban area, Armant, El-Kab, Edfu and Elephantine. This means that the beads could be made and shipped from there, or destined to these places, and

¹²³ Östborn and Gerding 2015.

¹²⁴ Gjesfeld 2015; Rivers, Knappett, and Evans 2013.

new trends could start from there. Considering that most resources come from the central and southern Eastern Desert and that the capital was in the Memphis-Fayyum area,¹²⁵ it seems plausible to find these sites in Middle and southern Upper Egypt.

Ain Asil, Ballas, Tod, and, when the full range of beads is analysed, Tell el-Dab'a look like intermediaries in the network, implying that the sites were passageways or (re)distribution centres in the circulation of beads during the Late Middle Kingdom. Therefore, beads would pass by there on their way to their destination or were (re)distributed from there. This could be due to the position of Ain Asil on the route linking Lower to southern Upper Egypt through the desert.

As far as materials are concerned, beads of turquoise, basalt, haematite, steatite, siltstone, diorite, and copper are found mostly near their sources, meaning both the places where they were found in Egypt and the places where they entered the country when they were imported. However, beads of copper are the only ones that do not create connections. At the same time, beads of other materials, including jasper, feldspar, serpentine, lapis lazuli, gold and electrum, amethyst, shell, and silver reach more far from their source in Egypt and, with the exception of the last three, create connections between the different sites. However, beads of amethyst and shell create connections stronger near their sources, while beads of silver do not create connections. Other materials, namely garnet, carnelian, agate, quartz, and limestone are widely found in Egypt, but only the beads of garnet and carnelian create connections between the sites. It is possible to hypothesize a localized production when beads are made of materials widely found in Egypt, but there are no types in common. However, often their number is too small to draw any conclusions. Moreover, beads of faience create connections between all the sites in Egypt.

Lastly, the Memphis-Fayyum area is always connected during the Late Middle Kingdom, and that the materials reaching far from their sources appear to do so by passing through the area. Considering that the capital was in the area during the Late Middle Kingdom, this is not surprising.

During the Early Second Intermediate Period, Tell el-Dab'a, Harageh, Qau el-Kebir, and Ain Asil seem to be the places where the beads would be made and sent from or sent to, or where trends could be spread from. More precisely, there appear to be connections between Tell el-Dab'a, Middle Egypt and Abydos, while the contacts with southern Upper Egypt would pass both through Harageh and Ain Asil, thus through the Memphis-Fayyum area and the desert, and, less, through the same Abydos. At the same time, Edfu and Tod appear to have been passageways or (re)distribution centres in the net-

125 Agut and Moreno-García 2016, 249–53; Grajetzki 2004; Quirke 2005.

work of beads. This means that these sites channelled part of the material culture, because objects and materials were either passing through there on their way to other sites or were (re)distributed from there.

The role of these sites during the Early Second Intermediate Period could be due to the fact that the materials used for beads come mostly from the Eastern Desert in southern Upper Egypt, thus they were passageways through which the material could be transported northwards, or (re)distribution centres from where the material would be (re)distributed. Given that part of the material that connects these sites to the other ones is found in Pan-grave tombs, it is possible that this group had some role in the circulation of the beads. Furthermore, the role of Abydos in the network of beads is less clear and looks more important when the full range of beads is considered. This signifies that, even though it shared a great part of its material culture, this part did not include the types most common among the sites.

Concerning the circulation of materials used to produce the beads, it can be noticed that during the Early Second Intermediate Period, the materials that would reach Egypt through Tell el-Dab'a, such as turquoise and lapis lazuli, are not found more south than Harageh. Conversely, materials coming from the Middle and southern Upper Egypt, such as amethyst, gold and electrum, appear to reach to Tell el-Dab'a. Materials widely found, such as carnelian and faience, seem to follow the described line that connects Tell el-Dab'a to Harageh, to Ain Asil, to Qau el-Kebir. Moreover, materials typical of the Pan-grave tombs, such as bone, shell, and mother of pearl, connect Tod and Qau el-Kebir. Given the presence of Pan-grave tombs there, this connection is not surprising. Lastly, there are materials found only at one site, such as silver in Qau el-Kebir and feldspar in Edfu. These beads, though, are too few for any conclusions.

During the Late Second Intermediate Period, Tell el-Dab'a, Sedment, Mostagedda, Qau el-Kebir, and the Theban area look like the possible producers or receivers in the circulation of beads, and where new trends could start. At the same time, Tell el-Maskhuta, Lisht, Matmar, Balabish, Abydos, and Hu look important in the network of beads only when their full range of beads is considered. This implies that these sites shared a great part of their material culture, but this part did not include many of the common types. All in all, the contacts detected suggest that Tell el-Dab'a was in contact mostly with the sites in Middle Egypt and Sedment. The Theban area too seems to be in contact with the sites in Middle Egypt, as well as with Tell el-Dab'a. Thus, the contacts between Lower and southern Upper Egypt seem to pass through Middle Egypt and Abydos, with the desert route being of scarce importance compared to the previous phase.

Tell Hebua seems to have been a passageway or (re)distribution centre in the network of beads during the Late Second Intermediate Period, namely where the materials and types of beads would pass by in their circulation or where they would be (re)distributed from. Concerning the circulation of materials during this period, lapis lazuli and turquoise still arrived in Tell el-Dab'a but arrive no further than that. Other materials, including steatite, amethyst, and feldspar, connect the sites in Middle Egypt more with the ones in Lower Egypt than the ones in southern Upper Egypt. This means that, while during the Late Middle Kingdom their circulation was nearer to their sources and thus more oriented towards southern Upper Egypt, it became more oriented towards Lower Egypt in the Late Second Intermediate Period. At the same time, materials such as haematite, garnet, and shell circulate mostly in Middle Egypt, while materials such as agate and quartz still show, like in the Late Middle Kingdom, a possibly localized production. Nevertheless, the amount is still too small to allow for any assumption. Other materials, such as rock crystal, serpentine, basalt, and bone could also show contacts between Upper and Lower Egypt, but the beads are too few beads to make any supposition. Contacts between the two parts of Egypt could also be shown by the beads of gold and electrum, but the analysis of other objects of this material is needed before drawing conclusions. And lastly, beads of faience show contacts between Lower and southern Upper Egypt mostly through Middle Egypt.

STONE VESSELS

This chapter discusses the role and connections of the sites involved in the network of stone vessels, detected through the types of stone vessels that these sites shared or not. The stone vessels included in this analysis are the ones excavated in contexts dated to the Late Middle Kingdom and the Second Intermediate Period. Stone vessels are less widespread than objects such as beads or pottery. Sometimes they are shown in pictures¹ or in drawings² on special plates in publications, but so far only one publication dealing with stone vessels throughout the history of ancient Egypt is available,³ while another one deals with the stone vessels bearing royal names and titles in the Late Second Intermediate Period and, mostly in the first half of the Eighteenth Dynasty.⁴ Another publication deals with the stone vessels in the Predynastic Period.⁵

Stone vessels were not very portable. They were sometimes transported as consumption goods, but often they were moved only in order to transport the items that they contained.⁶ These items were mostly cosmetic products, such as kohl, or ointments.⁷ Sometimes, stone vessels were produced specifically as part of burial equipment, or they were used in foundation deposits or as temple votives.⁸ Stone vessels, especially the ones inscribed with royal names or titles,⁹ were used also in diplomatic exchanges between royals or powerful

1 Such as in the publication of the cemeteries of Rifeh, Qau el-Kebir, Hu: Brunton, Gardiner, and Petrie 1930, pl. XXI; Engelbach et al. 1915, pl. VII; Petrie and Mace 1901, pls. XXIX–XXX; Petrie, Thompson, and Crum 1907, pl. XIA.

2 Such as in the publications of the cemeteries of Harageh, Riqqeh, Matmar, Mostagedda, Qau el-Kebir, and Denderah: Brunton 1948, pl. XLII; Brunton, Gardiner, and Petrie 1930, pls. III and XX; Brunton and Morant 1937, pl. LXVIII; Engelbach and Gunn 1923, pl. XLVII; Engelbach et al. 1915, pl. XIII; Petrie and Griffith 1900, pl. XX.

3 B.G. Aston 1994.

4 Lilyquist 1995.

5 Khouli 1978.

6 Lilyquist 1995, 2; Sparks 2003, 41.

7 Lilyquist 1995, 2.

8 Sparks 2003, 39.

9 For the Second Intermediate Period, only a few inscribed stone vessels have been retrieved, and come from outside Egypt or have no specific provenance: Lilyquist 1995,

persons of Egypt and other lands, as gift, or as trade goods;¹⁰ they could also be part of a war booty, or of tributes or taxes from conquered lands.¹¹

In the present work, stone vessels must meet the following criteria to be included in the analysis:

- They must come from clearly dated contexts;
- Their material and the details of their shapes must be retrievable from the publications;
- They must be entirely preserved, or their shape must be clear.

The condition in which vessels are preserved is also a noteworthy factor in the analysis. Especially when found outside tombs, vessels can be found fragmentary or only partially preserved. However, to examine the connections between sites and understand what types of stone vessels were shared, all the details of these types must be known, including the details of their shape. Therefore, only vessels that are entirely preserved or whose shape is precisely known can be used in the analysis.

Also for the stone vessels, if the same type of stone vessels is retrieved from two or more sites, this does not necessarily mean that it was brought from one of these sites to another one, but only that in these sites a similar material culture was used.¹² This situation derives from the fact that, because of the archaeological bias and of the difficulty in dating part of the contexts, the same type of stone vessel could have arrived to those sites through other channels, but we still miss the information or the data.¹³

Furthermore, stone vessels are more difficult to model than other objects such as pottery or beads, thus they have less variety. Nevertheless, there are types and stone that are more typically or exclusively used in certain period, and there are vessels bearing royal names, as mentioned above.¹⁴ Thus, stone vessels could help dating the archaeological context, namely the location where they are found and the other objects placed with them.¹⁵

Nevertheless, also with stone vessels there are fossils. These are items produced in periods earlier than the one to which their context is dated, but retrieved in a later context because they were still in use, were reused, or kept as heirlooms.¹⁶ Given that stone vessels were considered precious also in

22–23, 46–48.

¹⁰ Sparks 2003, 39–42.

¹¹ Sparks 2003, 41–42.

¹² Brughmans 2013, 638–39; Sindbæk 2007b, 66; Sindbæk 2013, 74–76, 82.

¹³ Sindbæk 2013, 72.

¹⁴ See the catalogues in: B.G. Aston 1994; Lilyquist 1995.

¹⁵ Lilyquist 1995, 3–4; Sparks 2003, 46–47.

¹⁶ Sparks 2003, 42–43, 46–47.

antiquity, the prolonged use or reuse of an item happened more often than with other objects such as beads.¹⁷ Another possible cause for fossils include post-depositional accidents, which are events happening after the context was originally created and altering its contents or appearance.¹⁸ In the present work, fossils are taken into consideration for the analysis, because the aim is to study the material culture in use during the Late Middle Kingdom and the Second Intermediate Period. On the contrary, stone vessels produced in the Late Middle Kingdom and the Second Intermediate Period, but retrieved in contexts of later periods, are omitted from the analysis because they are not informative of their use in the periods relevant to the present research.

Thus, can stone vessels be used to date the archaeological context? Vessels with royal names inscribed on them can help dating the contexts where they are found.¹⁹ However, even in this case the dating can be controversial, because the inscription on the vessel could be not contemporary with the vessel, but have been added later, or could be not contemporary with its archaeological context.²⁰ Apart from this, the presence of fossils makes dating the contexts more difficult,²¹ and stone vessels have not been differentiated inside the Second Intermediate Period.²² For the present research, this means that only contexts that have been dated through other means have been included in the analysis, while undated contexts have been excluded. This way of proceeding has been chosen because only published material has been used for the present research, and the data reported are not accurate enough to date contexts.

The quality of the published material influences also other aspects, such as the nomenclature. There is no standardized way to refer to the shapes of the stone vessels. Designations such as *kohl* pot, namely vessels for storing *kohl*, or cosmetic vessels, namely vessels for storing cosmetic products such as ointments, or libation vessels, namely vessels for making libations, or canopic jars, namely vessels for storing organs taken away from the dead during the mummification process, are sometimes used in publications. Indeed, this can be noticed in nearly all the publications consulted for this chapter. Nevertheless, these terms are too wide and do not describe the shape of the vessels precisely, but refer more to their use. Therefore, following other publications,²³ in the present research specific and standardized designations for

17 Sparks 2003, 42–43.

18 For a discussion on post-depositional processes: Renfrew and Bahn 2016, 49–72.

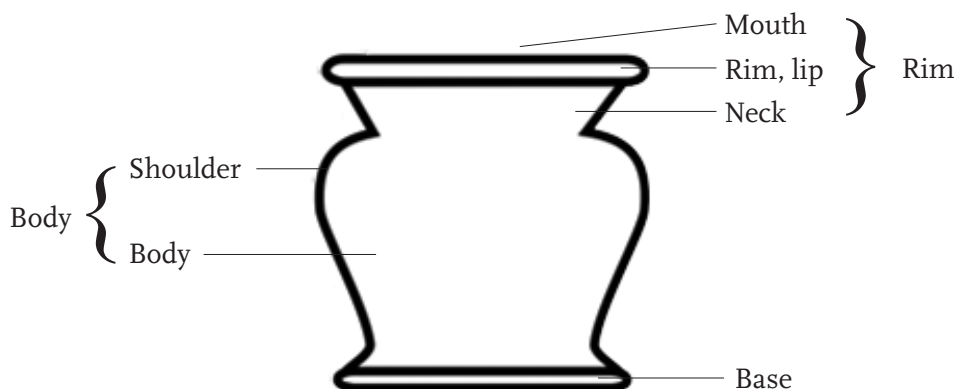
19 Lilyquist 1995, 3–4; Sparks 2003, 46–47.

20 Sparks 2003, 46–47.

21 Sparks 2003, 42–43, 46–47.

22 This differentiation is not found in Aston's publication either.

23 Lilyquist 1995, 4–12.



Drawing 1: Parts of a vessel as used in the present work and in pottery studies. Author's own drawing.

the main parts of the vessels have been loaned from designations used for pottery.²⁴

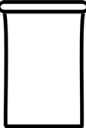
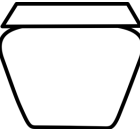
The main parts recognized in a vessel in pottery studies include:

1. the mouth, which is the top opening of a vessel;
2. the rim, which is the part connecting the mouth and the neck;
3. the lip, which is the outer part of the rim;
4. the neck, which is the part connecting the rim to the shoulder;
5. the shoulder, which is the part connecting the neck to the body;
6. the body, which is the central, main part of the vessel, described like a geometric figure;
7. the base, which is the part underneath the body and in contact with the support surface.

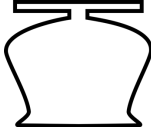
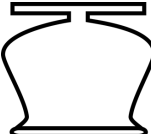
To avoid putting too many columns in the database, making it too difficult to read and analyse it, the aforementioned parts have been grouped under three terms: the rim (i.e. descriptions of the mouth, the rim, the lip, and the neck); the body (descriptions of the shoulder and the body); the base.²⁵ The types considered in the analysis, shown in Table 2, are based on the combination of the aforementioned parts and of the materials used to produced them; these types are a personal elaboration of the author.

24 Aston et al. 2004, 46–50; Rice 1987, 212–20; Wodzińska 2010, 4–7.

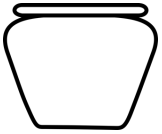
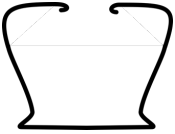
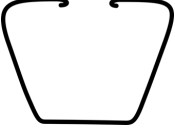
25 It should also be mentioned that these vessels were sometimes closed by lids. However, the data available are too few to make any distinction among lids, therefore they have not been included in the analysis.

No.	Description	Drawing
1	Body: flaring; cylindrical but narrower at the centre and larger towards the rim and the base. Rim: rounded, with round section. Base: outward, larger than the body.	
2	Body: flaring; cylindrical but narrower at the centre and larger towards the rim and the base. Rim: rounded, with round section. Base: outward rounded, larger than the body and with protruding rim.	
3	Body: cylindrical, without change in the circumference. Rim: direct, simple and directly connected to the body. Base: flat, as large as the body.	
4	Body: cylindrical, without change in the circumference. Rim: direct, simple and directly connected to the body. Base: flat on a pedestal with feet.	
5	Body: cylindrical, without change in the circumference. Rim: rounded, with round section. Base: flat, as large as the body.	
6	Body: squat shouldered; wider than tall, with the largest circumference at the shoulder. Rim: folded-over, with triangular section larger at the bottom. Base: outward, larger than the body.	
7	Body: squat shouldered; wider than tall, with the largest circumference at the shoulder. Rim: folded-over, with triangular section larger at the bottom. Base: outward rounded, larger than the body and with protruding rim.	
8	Body: squat shouldered; wider than tall, with the largest circumference at the shoulder. Rim: folded-over, with triangular section larger at the bottom. Base: flat, as large as the body.	

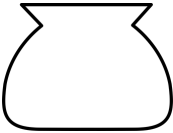
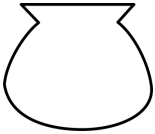
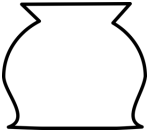
(continued)

No.	Description	Drawing
9	Body: squat shouldered; wider than tall, with the largest circumference at the shoulder. Rim: flaring direct, simple and connected to the body through a flaring neck, larger at the top. Base: outward, larger than the body.	
10	Body: squat shouldered; wider than tall, with the largest circumference at the shoulder. Rim: flaring direct, simple and connected to the body through a flaring neck, larger at the top. Base: outward rounded, larger than the body and with protruding rim.	
11	Body: squat shouldered; wider than tall, with the largest circumference at the shoulder. Rim: flaring rounded, with round section and connected to body through flaring neck, larger at top. Base: outward, larger than the body.	
12	Body: squat shouldered; wider than tall, with largest circumference at shoulder. Rim: flaring rounded, with round section and connected to body through flaring neck, larger at top. Base: outward rounded, larger than body, with protruding rim.	
13	Body: squat shouldered; wider than tall, with largest circumference at shoulder. Rim: flaring rounded, with round section and connected to body through a flaring neck, larger at top. Base: flat, as large as the body.	
14	Body: squat shouldered; wider than tall, with largest circumference at shoulder. Rim: flat everted, with flat section and connected to body through narrow neck. Base: outward, larger than body.	
15	Body: squat shouldered; wider than tall, with largest circumference at shoulder. Rim: flat everted, with flat section and connected to body through narrow neck. Base: outward rounded, larger than body and with protruding rim.	
16	Body: squat shouldered; wider than tall, with largest circumference at the shoulder. Rim: rounded, with round section. Base: outward rounded, larger than body and with protruding rim.	

(continued)

No.	Description	Drawing
17	Body: squat shouldered; wider than tall, with the largest circumference at the shoulder. Rim: rounded, with round section. Base: flat, as large as the body.	
18	Body: squat shouldered; wider than tall, with the largest circumference at the shoulder. Rim: inward, slightly going inside the opening. Base: outward, larger than the body.	
19	Body: squat shouldered; wider than tall, with the largest circumference at the shoulder. Rim: inward, slightly going inside the opening. Base: flat, as large as the body.	
20	Body: piriform; taller than wide, with the largest circumference at the shoulder. Rim: flaring direct, simple and connected to the body through a flaring neck, larger at the top. Base: outward, larger than the body.	
21	Body: piriform; taller than wide, with the largest circumference at the shoulder. Rim: flaring direct, simple and connected to the body through a flaring neck, larger at the top. Base: flat, as large as the body.	
22	Body: piriform; taller than wide, with the largest circumference at the shoulder. Rim: flaring rounded, with round section and connected to the body through a flaring neck, larger at the top. Base: outward, larger than the body.	
23	Body: piriform; taller than wide, with the largest circumference at the shoulder. Rim: flaring rounded, with round section and connected to the body through a flaring neck, larger at the top. Base: flat, as large as the body.	
24	Body: piriform; taller than wide, with the largest circumference at the shoulder. Rim: flaring rounded, with round section and connected to the body through a flaring neck, larger at the top. Base: pointed, ending in a tip.	

(continued)

No.	Description	Drawing
25	Body: piriform; taller than wide, with the largest circumference at the shoulder. Rim: inward, slightly going inside the opening. Base: outward, larger than the body.	
26	Body: piriform; taller than wide, with the largest circumference at the shoulder. Rim: inward, slightly going inside the opening. Base: flat, as large as than the body.	
27	Body: drop-shaped; taller than wide, with the largest circumference near the base. Rim: flaring scaled, made of superimposed round sections, progressively larger towards the top. Base: pointed, ending in a tip.	
28	Body: drop-shaped; taller than wide, with the largest circumference near the base. Rim: flaring direct, simple and connected to the body through a flaring neck, larger at the top. Base: flat, as large as the body.	
29	Body: drop-shaped; taller than wide, with the largest circumference near the base. Rim: flaring direct, simple and connected to the body through a flaring neck, larger at the top. Base: round, making a rounded convex curve.	
30	Body: bag-shaped; wider than tall, with the largest circumference near the base. Rim: flaring direct, simple and connected to the body through a flaring neck, larger at the top. Base: flat, as large as the body.	
31	Body: bag-shaped; wider than tall, with the largest circumference near the base. Rim: flaring direct, simple and connected to the body through a flaring neck, larger at the top. Base: round, making a rounded convex curve.	
32	Body: round, with the largest circumference in its middle. Rim: flaring direct, simple and connected to the body through a flaring neck, larger at the top. Base: outward, larger than the body.	

(continued)

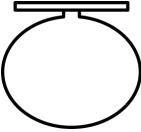
No.	Description	Drawing
33	Body: round, with the largest circumference in its middle. Rim: folded-over, with triangular section larger at the bottom. Base: outward, larger than the body.	
34	Body: globular, with spherical body. Rim: flaring rounded, with round section and connected to the body through a flaring neck, larger at the top. Base: round, making a rounded convex curve.	
35	Body: globular, with spherical body. Rim: flat everted, with flat section and connected to the body through a narrow neck. Base: round, making a rounded convex curve.	
36	Shape: rectangular dish	
37	Shape: rectangular dish with spout	

Table 2: Description and outline of the main types of stone vessels. Author's own drawings.

Finally, an important point concerns the materials used in the production of stone vessels.²⁶ Sometimes these materials have been misinterpreted, or their designation is otherwise not entirely correct.²⁷ For the present research, considering that it is not possible to check the materials of the stone vessels described in the publications and included in the analysis, it has been chosen to follow the designations traditionally used in Egyptology and reported in most of the publications.

²⁶ B.G. Aston 1994, 11–73; Lilyquist 1995, 12–14; Lucas 1948, 462–87.

²⁷ This is the case especially with what in Egyptology has traditionally been defined ‘blue marble’ (which is actually anhydrite) and ‘alabaster’ (which is actually calcite-alabaster), while real alabaster is a different type of stone: B.G. Aston 1994, 42–47, 51–53; Aston, Harrell, and Shaw 2000, 22–23, 59–60; Lucas 1948, 447–48, 470–71.

THE LATE MIDDLE KINGDOM

Concerning the contexts examined in the analysis of the stone vessels in the Late Middle Kingdom (Table 8 in Appendix I; Appendix VI), it can be noticed that Hu,²⁸ Harageh,²⁹ Rifeh,³⁰ and Abydos³¹ are the sites that have contributed most contexts.³² These contexts are composed almost entirely of common burials, while royal burials with stone vessels have been excavated in Dahshur,³³ where a stone vessel comes also from a non-royal tomb,³⁴ Lahun,³⁵ which has contributed mostly contexts from non-royal burials,³⁶ Lisht,³⁷ and Hawara,³⁸ hence from the area of the capital of that time. Lastly, the settlement contexts included in the analysis are very few and come from Lahun,³⁹ Qasr el-Sagha,⁴⁰ and Elephantine.⁴¹

Furthermore, it can be remarked that the sites with more types of stone vessels are Harageh,⁴² Abydos,⁴³ Hu,⁴⁴ and Edfu.⁴⁵ Nevertheless, when related

- 28 B.G. Aston 1994, 141–45; Bourriau 2009, 52–53, 55–57, 59, 61–63, 67, 69, 71, 73, 75–81, and 83–90; Petrie and Mace 1901, 44 and pls. XXVIII–XXX.
- 29 B.G. Aston 1994, 142–45; Engelbach and Gunn 1923, 16–17 and pl. XLVII.
- 30 B.G. Aston 1994, 142–43; Petrie, Thompson, and Crum 1907, 13 and pl. XIA.
- 31 B.G. Aston 1994, 141–46; Ayrton et al. 1904, 19 and 47, pl. XI; Garstang, Newberry, and Milte 1901; Kemp, Merrillees, and Edel 1980, 124–26; Peet and Loat 1913, 24–27; Petrie et al. 1925, pl. XXX; Randall-MacIver, Mace, and Griffith 1902, 55; Tooley 2015.
- 32 For an overview of stone vessels in the Late Middle Kingdom: B.G. Aston 1994, 141–46.
- 33 B.G. Aston 1994, 142, 145; De Morgan, Legrain, and Jéquier 1903, 48–68 and 74–77; De Morgan et al. 1895, 63, 71–75 and 96–114.
- 34 Baba and Yazawa 2015.
- 35 Brunton 1920, 17–22; Winlock 1934, 19 and 66–69.
- 36 B.G. Aston 1994, 145; Petrie, Brunton, and Murray 1923, 13–14, 17, 28 and pl. XLVIII; Petrie et al. 1891, 12–13 and pl. XIII.
- 37 Kemp, Merrillees, and Edel 1980, 220–25; Lansing and Hayes 1934.
- 38 Farağ and Iskandar 1971, 28, 31.
- 39 B.G. Aston 1994, 145; Brunton 1920, 17–22; Petrie, Brunton, and Murray 1923, 13–14, 17, 28 and pl. XLVIII; Petrie et al. 1891, 12–13 and pl. XIII; Winlock 1934, 19 and 66–69.
- 40 Arnold, Arnold, and Brodbeck 1979, 28; Śliwa 1992a; Śliwa 1992b.
- 41 Von Pilgrim 1996, 320.
- 42 B.G. Aston 1994, 142–45; Engelbach and Gunn 1923, 16–17 and pl. XLVII.
- 43 B.G. Aston 1994, 141–46; Ayrton et al. 1904, 19 and 47, pl. XI; Garstang, Newberry, and Milte 1901; Kemp, Merrillees, and Edel 1980, 124–26; Peet and Loat 1913, 24–27; Petrie et al. 1925, pl. XXX; Randall-MacIver, Mace, and Griffith 1902, 55; Tooley 2015.
- 44 B.G. Aston 1994, 141–45; Bourriau 2009, 52–53, 55–57, 59, 61–63, 67, 69, 71, 73, 75–81, and 83–90; Petrie and Mace 1901, 44 and pls. XXVIII–XXX.
- 45 B.G. Aston 1994, 143–46; Michałowski et al. 1939, 46–49 and pls. XX–XXI; Michałowski et al. 1950, 177–82 and pls. XVIII–XX .

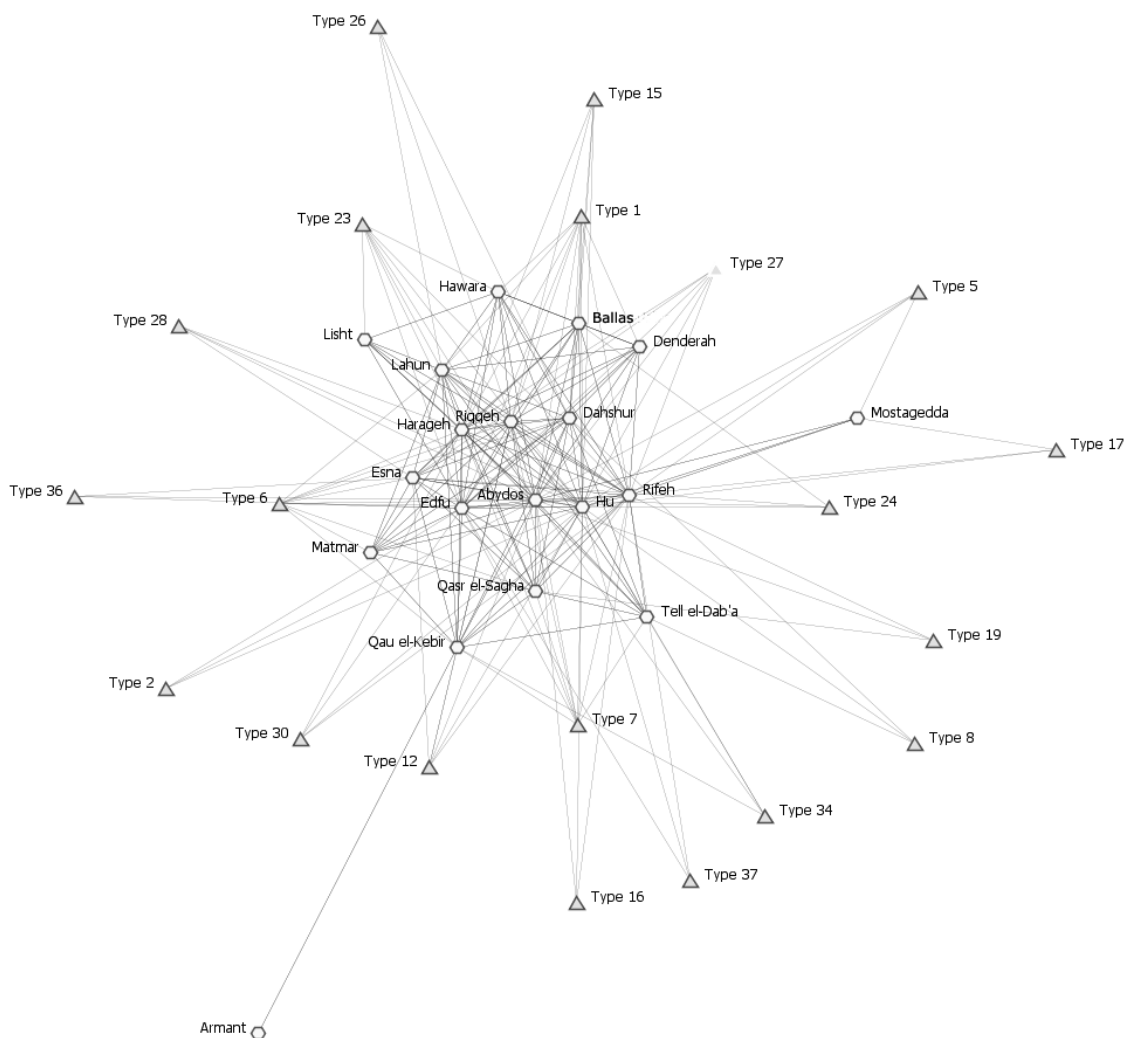


Figure 28: Contexts of the Late Middle Kingdom and the most common stone vessels.

to the number of contexts, the higher variety is found in Lahun⁴⁶ and Edfu,⁴⁷ which are not among the sites that have contributed the higher number of contexts; they have contributed mostly non-royal funerary contexts. Thus, the variety found on a site does not depend on the number of tombs or on their being royal or common. On the contrary, Matmar⁴⁸ and Qau el-Kebir⁴⁹ are the sites with the least variety, compared to the number of contexts where stone vessels have been retrieved.

46 B.G. Aston 1994, 145; Brunton 1920, 17–22; Petrie, Brunton, and Murray 1923, 13–14, 17, 28 and pl. XLVIII; Petrie et al. 1891, 12–13 and pl. XIII; Winlock 1934, 19 and 66–69.

47 B.G. Aston 1994, 143–46; Michałowski et al. 1939, 46–49 and pls. XX–XXI; Michałowski et al. 1950, 177–82 and pls. XVIII–XX.

48 Brunton 1948, 54–56 and pl. XLII.

49 B.G. Aston 1994, 142–44; Brunton, Gardiner, and Petrie 1930, 1–3 and pl. III.

From all the mentioned sites, as well as from the contexts excavated in Tell el-Dab'a,⁵⁰ Riqqeh,⁵¹ Mostagedda,⁵² Ballas,⁵³ Denderah,⁵⁴ Armant,⁵⁵ and Esna,⁵⁶ it is possible to make some remarks about the most common types and materials concerning the stone vessels. Concerning the types of stone vessels most common in the contexts of the Late Middle Kingdom, these can be seen in Figure 28 and include vessels with flaring body and rounded rim or squat shouldered body and folded-over rim, and outward or outward rounded base (types 1, 2, 6, and 7). Still among the most common, but found in slightly fewer contexts, are vessels with drop-shaped body and flaring scaled rim and pointed base, vessels with piriform body and flaring rounded rim and flat base, and vessels with squat shouldered body and flaring rounded or flat everted rim and outward rounded base (types 12, 15, 23, and 26). Another group of vessels is common, but less than the previous ones and includes vessels with bag-shaped or drop-shaped body and flaring direct rim and flat base, vessels with cylindrical body and direct or rounded rim and flat base, vessels with globular body and flaring rounded rim and round base, vessels with piriform body and flaring rounded rim and pointed base or inward rim and flat base, rectangular dishes sometimes with a spout, vessels with squat shouldered body and flat everted, or folded over, or inward, or flaring rounded rim and outward, or outward rounded, or flat base (types 3, 5, 8, 13, 14, 16, 17, 19, 24, 26, 28, 30, 34, 36, and 37).

As far as the materials used for the stone vessels during the Late Middle Kingdom are concerned, the most common is calcite-alabaster. Other materials used to produce stone vessels include anhydrite, obsidian, siltstone, steatite, serpentine, limestone, and diorite. Moreover, the vessels of obsidian found in royal tombs are often also decorated with gold. Lastly, stone vessels are rarely also produced using carnelian, lapis lazuli, basalt, sedimentary quartzite, and marble.

The first one-mode graph

In the first one-mode graph (Figures 29–32), all the sites but Elephantine appear connected. Moreover, Lahun, Dahshur, Harageh, Riqqeh, Rifeh, Hu,

50 Bietak, Mlinar, and Schwab 1991, 33; Forstner-Müller 2008, 129–40; Schiestl 2009, 121–24, 241, 375.

51 B.G. Aston 1994, 144; Engelbach et al. 1915, 13 and 16, pls. VII and XIII.

52 B.G. Aston 1994, 146–47; Brunton and Morant 1937, 113–14 and pl. LXVIII.

53 Petrie, Quibell, and Spurrell 1896, 8 and pl. XVII.

54 B.G. Aston 1994, 144; Petrie and Griffith 1900, 25–26 and pl. XX.

55 Mond and Myers 1937, 22–23, 43–44 and pls. XIV and XVIII.

56 B.G. Aston 1994, 141–46; Downes 1974, 96–99.

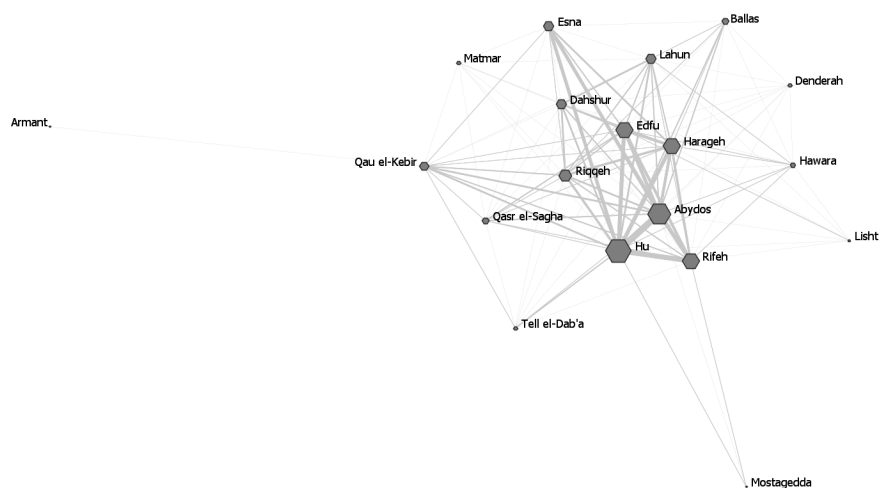


Figure 29: Degree centrality of the first one-mode graph of the stone vessels during the LMK.

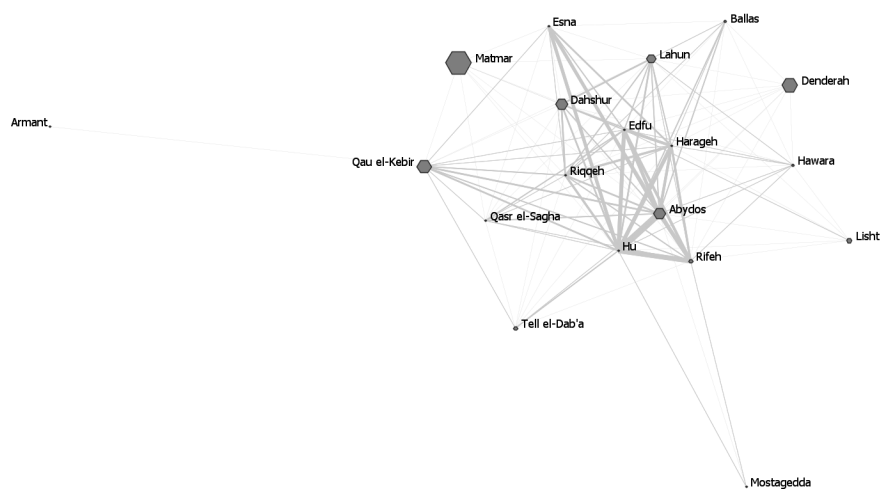


Figure 30: Betweenness centrality of the first one-mode graph of the stone vessels during the LMK.

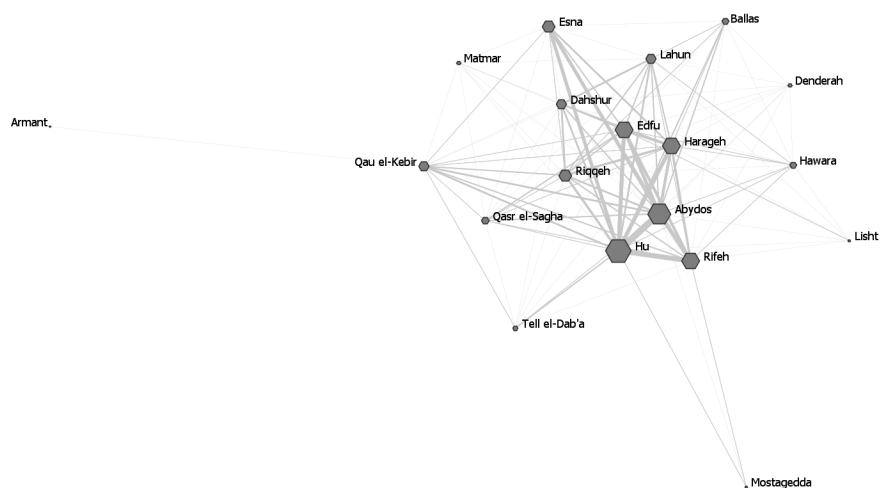


Figure 31: Eigenvector centrality of the first one-mode graph of the stone vessels during the LMK.

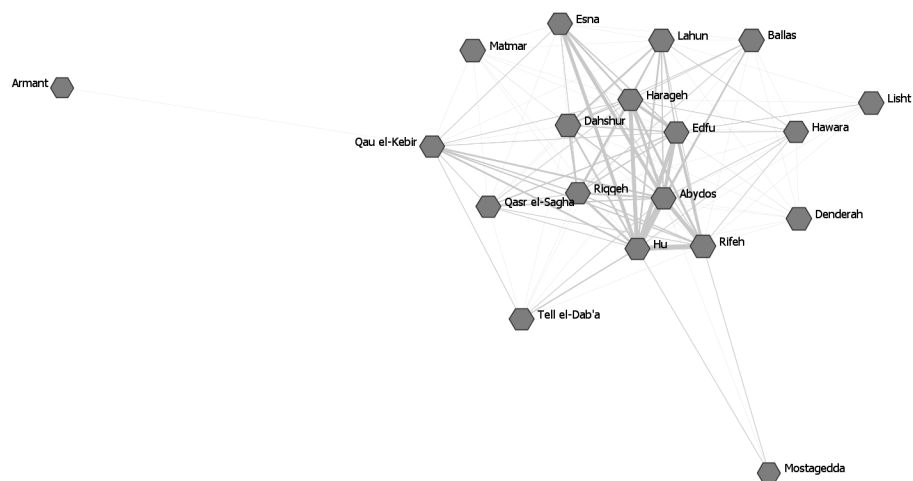


Figure 32: Closeness centrality of the first one-mode graph of the stone vessels during the LMK.

Abydos, and Edfu are more central in the network, meaning that they are important players.

Concerning the centrality measures (Tables 26, 39, 52, 65 in Appendix II), it can be remarked that all the sites, but Elephantine, score in the very high rank for the closeness centrality, meaning that there is no difference in how easy it was to reach them through the connections in the network of stone vessels; the score of Elephantine could be due, however, to archaeological bias, considering the very small sample included in the analysis. This can be expected in a period when Egypt was still united, but also shows that closeness is not very informative or interesting, because it does not help to reveal any difference between the sites.

A first group of sites, including Harageh, Rifeh, Abydos, Hu, and Edfu sports a high or very high rank for both the degree centrality and the eigenvector centrality, meaning that they had many strong connections of good quality, thus they were the better-connected sites. Riqqeh and Esna also follow a similar pattern, but their scores are in the middle rank. This implies that the sites are also part of this group but are probably of less importance. A second group of sites, which includes Matmar, Qau el-Kebir, and Denderah, features a betweenness centrality between the very high and the middle rank. This implies that the sites could be important intermediaries, in the network of stone vessels.

Furthermore, Lahun and Dahshur score in the middle rank for the eigenvector centrality, which implies that these sites had decent connections with the major players of the network of stone vessels. Dahshur also scores in the middle rank also for the betweenness centrality, which gives the site relevance also as an intermediary. Lastly, Tell el-Dab'a, Lisht, Hawara, Qasr el-Sagha, Mostagedda, Ballas, Armant, and Elephantine score in the low rank for all the measures. Therefore, these sites do not create strong connections in the network detected from the available data. Especially for Elephantine, as mentioned earlier, the risk of archaeological bias makes it necessary to take the results cautiously.

The one-mode graph based on the Jaccard similarity

The second one-mode graph (Figures 33–36), created through the Jaccard algorithm, has the same shape as the first one-mode graph, meaning that its structure is reliable. From the analysis of the centrality measures (Tables 78, 91, 104, 117 in Appendix III) it appears that all the sites, but Elephantine, again rank in the high or very high rank for the closeness centrality. Hence, there is no real difference in how the sites could be reached through the connections in the network of stone vessels. This also means that, again, closeness is not

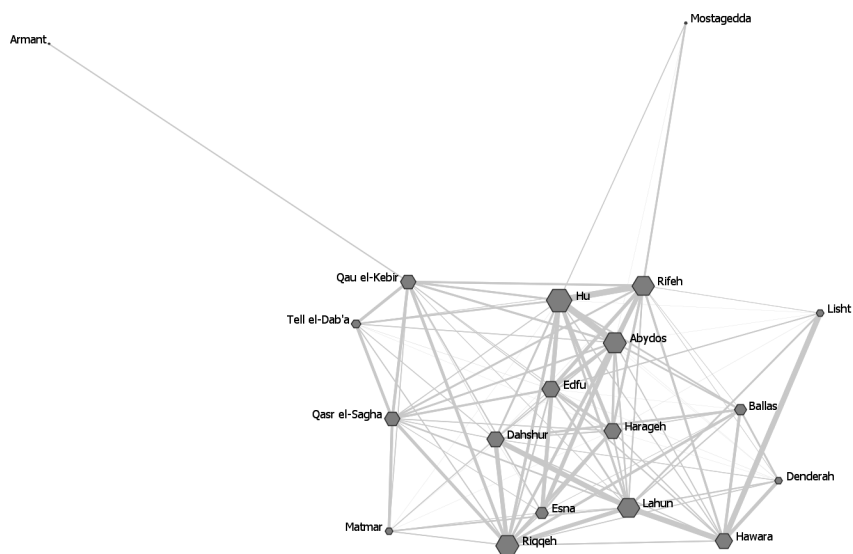


Figure 33: Degree centrality of the second one-mode graph of the stone vessels during the LMK.

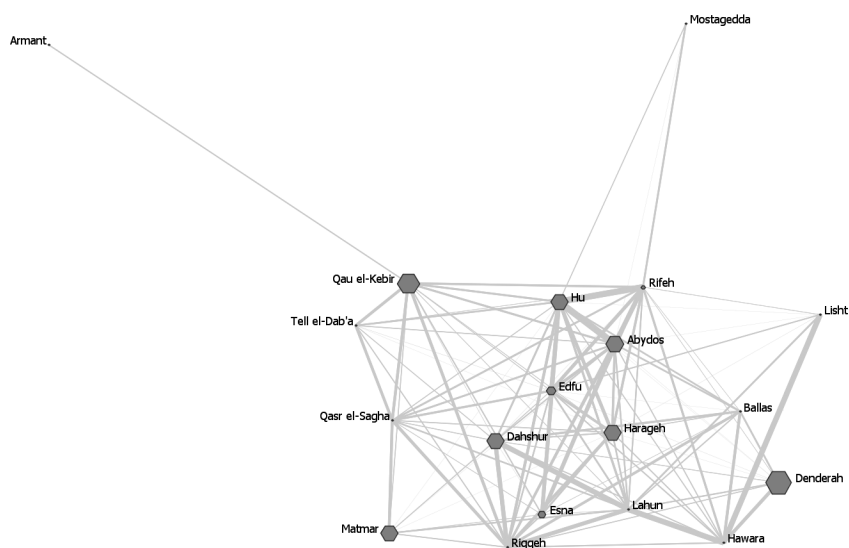


Figure 34: Betweenness centrality of the second one-mode graph of the stone vessels during the LMK.

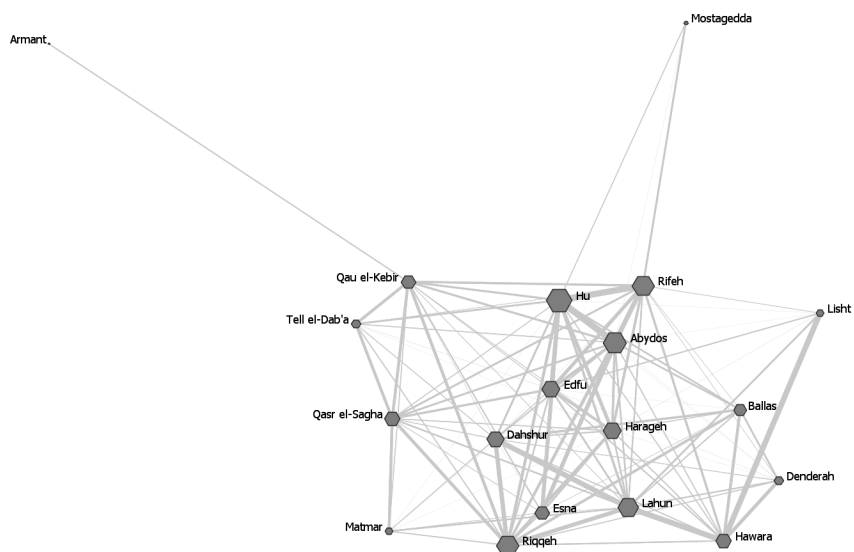


Figure 35: Eigenvector centrality of the second one-mode graph of the stone vessels during the LMK.

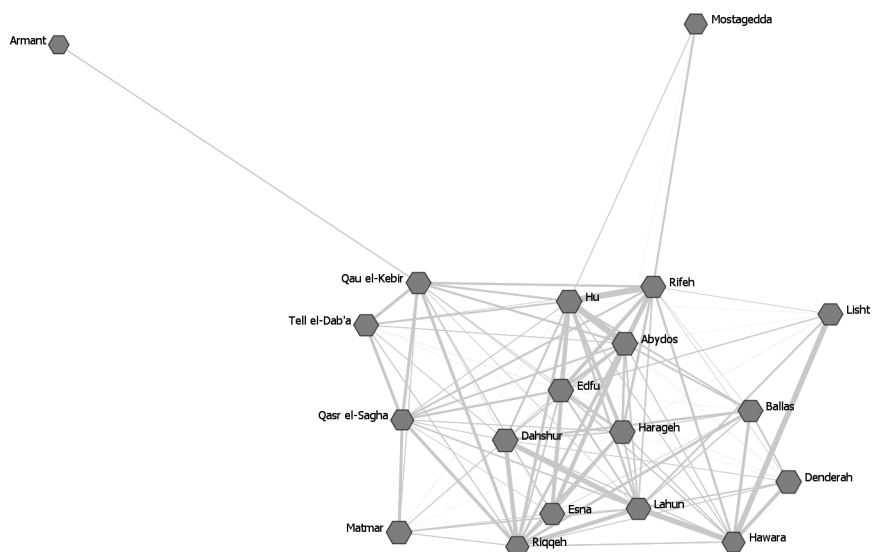


Figure 36: Closeness centrality of the second one-mode graph of the stone vessels during the LMK.

very informative or interesting, because it does not reveal any difference between the sites: the score of Elephantine could be due to archaeological bias.

Half of the sites analysed, including Tell el-Dab'a, Harageh, Lisht, Rifeh, Matmar, Mostagedda, Qau el-Kebir, Armant, Esna, Edfu, and Elephantine, have similar scores in both one-mode graphs, with small differences that do not alter their general pattern. Thus, Harageh, Rifeh, Esna, and Edfu still appear among the better-connected sites, namely sites with the more and stronger connections in the network of stone vessels, though Esna still seems to have a secondary role. Moreover, in the present graph Harageh has a high score also for the betweenness centrality. At the same time, Matmar and Qau el-Kebir are still characterized by a high or very high betweenness centrality, which makes them look like intermediaries in the network of stone vessels. Lastly Tell el-Dab'a, Lisht, Mostagedda, Armant, and Elephantine have low or very low scores in both two-mode graphs.

Another group of sites, including Riqqeh, Abydos, Hu, and Denderah, score a similar pattern in both one-mode graphs, but their scores are much higher in the second one-mode graph. Therefore, Riqqeh, Abydos and Hu have their degree centrality and eigenvector centrality in the very high rank, while Denderah is still characterized by a betweenness centrality in the very high rank. These results are because these sites have in common part of their range of stone vessels, but the most common types are not prevalent in this part.

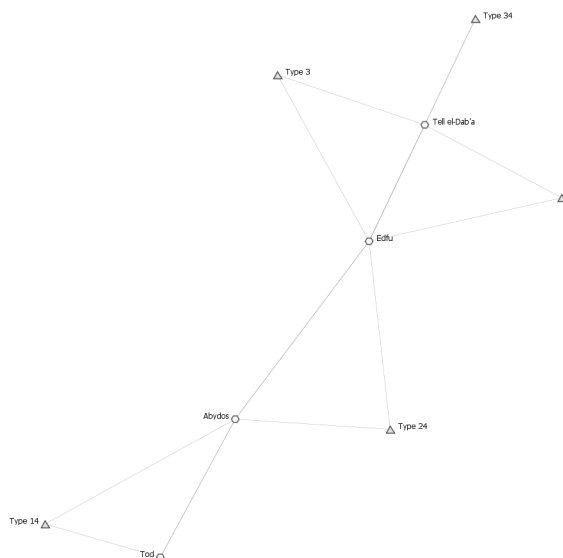
The last group of sites, including Dahshur, Hawara, Lahun, Qasr el-Sagha, and Ballas have different scores in the two mode graphs. While in the previous graph all these sites score mostly in the lowest ranks and at most in the middle rank, in the present graph they score in the high or very high rank. This means that, when their full range of stone vessels is considered, they appear more relevant in the network of stone vessels. This situation also comes from the fact that, though they have in common types of stone vessels with the other sites, the most widespread types are not prevalent.

Summary

A group of sites, including Harageh, Rifeh, Abydos, Hu, Esna, and Edfu, appear to be the better-connected sites and the major players in the network of stone vessels. This means that these sites could be the starting or ending points of the flow of communications in the network of stone vessels, and that they had the strength to spread new trends.⁵⁷ Nevertheless, the sites of Riqqeh, Esna, and Hu appear to play a less important role when only the shared

57 Östborn and Gerding 2015.

Figure 37: Contexts of the Early Second Intermediate Period and the most common stone vessels.



types of stone vessels are considered, because they did not have many of the most widespread types in common with the other sites.

Furthermore, Matmar, Qau el-Kebir, and Denderah appear to play the role of intermediaries, thus of sites regulating the flow of the circulation of goods, and thus of passageways or (re)distribution centres, in the network of stone vessels.⁵⁸ However, Denderah seem to be of less prominence when only the shared types are considered, because the types of stone vessels it shared do not include many of the most common ones.

When only the shared types of stone vessels are considered, the sites of Dahshur, Hawara, Lahun, Qasr el-Sagha, and Ballas have no role in the networks of the stone vessels. Nevertheless, they are included in the major players when their full range of stone vessels is considered. This happens because the material culture that they have in common with other sites does not involve many of the most common types.

THE EARLY SECOND INTERMEDIATE PERIOD

The sites and contexts examined in the analysis of the stone vessels of the Early Second Intermediate Period (Table 14 in Appendix I; Appendix VII) are way fewer than the ones examined in the analysis of the Late Middle Kingdom.⁵⁹

⁵⁸ Gjesfeld 2015; Rivers, Knappett, and Evans 2013.

⁵⁹ For an overview of stone vessels in the Second Intermediate Period: B.G. Aston 1994, 146–47.

Among these sites, only Tod⁶⁰ and Ain Asil⁶¹ are absent from the analysis of the Late Middle Kingdom, while the other ones are present in both phases. It can be noticed that Tell el-Dab'a⁶² is the site that contributes the higher number of contexts of the Early Second Intermediate Period with stone vessels. The number of contexts from Tell el-Dab'a is not surprising, given that it was one of the capitals at that time.⁶³

The contexts of the Early Second Intermediate Period with stone vessels are almost exclusively burial contexts, while the few settlement contexts come from Ain Asil.⁶⁴ The sites with the larger variety of types are Tell el-Dab'a⁶⁵ and Edfu,⁶⁶ while this latter and Abydos⁶⁷ are the sites where the variety proportional to the number of contexts is the widest. As already remarked for the Late Middle Kingdom, the types and number of contexts do not influence the variety of types.

All in all, in the examined contexts the most common type of stone vessel is the one with squat shouldered body and folded-over rim and outward rounded base (type 7), which was among the most common ones also in the Late Middle Kingdom. Other types of stone vessels common in contexts in the Early Second Intermediate Period can also be seen in Figure 37 and include vessels with cylindrical body and direct rim and flat base sometimes raised on feet, vessels with globular body and flaring rounded or flat everted rim and round base, vessels with piriform body and flaring rounded rim and pointed base, vessels with squat shouldered body and flat everted or folded-over rim and outward base (types 3, 4, 6, 15, 24, 34, and 35). All the types mentioned are found among the common ones also in the Late Middle Kingdom.

As far as the materials used for the stone vessels during the Early Second Intermediate Period are concerned, calcite-alabaster is the most common. Other materials from which stone vessels are produced, though rarely, include haematite, serpentine, siltstone, and quartz, which were found also in the Late Middle Kingdom. A vessel of sandstone is mentioned from Ain Asil

60 Barguet 1952, 19–21 and 29.

61 Marchand, Soukiasian, and Bourriau 2010, 293–96.

62 Bietak, Mlinar, and Schwab 1991, 43; Forstner-Müller 2008, 140–217; S.E.M. Müller 2013, 120.

63 Bietak 1996; Bietak 1997.

64 Marchand, Soukiasian, and Bourriau 2010, 293–96.

65 Bietak, Mlinar, and Schwab 1991, 43; Forstner-Müller 2008, 140–217; S.E.M. Müller 2013, 120.

66 Michałowski et al. 1950, 177–82, pls. XVIII and XX.

67 B.G. Aston 1994, 142–44; Garstang, Newberry, and Milte 1901; Peet 1914, 57–64; Randall-MacIver, Mace, and Griffith 1902, 67 and 97–101.

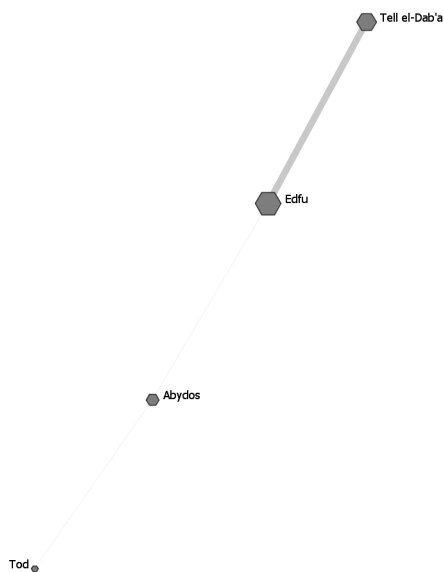


Figure 38: Degree centrality of the first one-mode graph of the stone vessels during the ESIP.

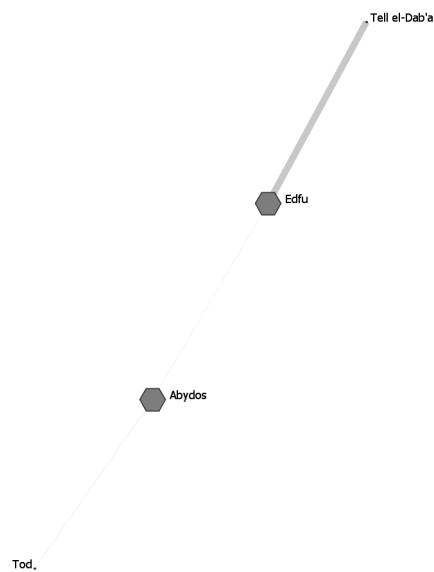


Figure 39: Betweenness centrality of the first one-mode graph of the stone vessels during the ESIP.

is also reported in the publications, but it is not clear what the author mentioning it means by this name.⁶⁸

Lastly, there are more tombs with stone vessels from Abydos⁶⁹ and Qau el-Kebir⁷⁰ that are dated to the Second Intermediate Period. Moreover, tombs of the Second Intermediate Period with stone vessels have been excavated in Esna⁷¹ and Hu.⁷² Nevertheless, all these tombs could not be included in the analysis because they have not been precisely dated to the Early or to the Late Second Intermediate Period, or they have actually been dated to the second phase.⁷³ It can be noticed that the types common in these undated tombs are the ones already mentioned for the other dated contexts included in the analysis.

68 Marchand, Soukiassian, and Bourriau 2010, 294.

69 B.G. Aston 1994, 142–44; Garstang, Newberry, and Milte 1901; Peet 1914, 57–64; Randall-MacIver, Mace, and Griffith 1902, 67 and 97–101.

70 B.G. Aston 1994, 146–47; Brunton, Gardiner, and Petrie 1930, 3–10 and pls. XX–XXI.

71 Downes 1974, 9–10 and 96–99.

72 Petrie and Mace 1901, 45–53.

73 Bourriau 2009, 52–90; Williams 1975, 167–72, 205–16.

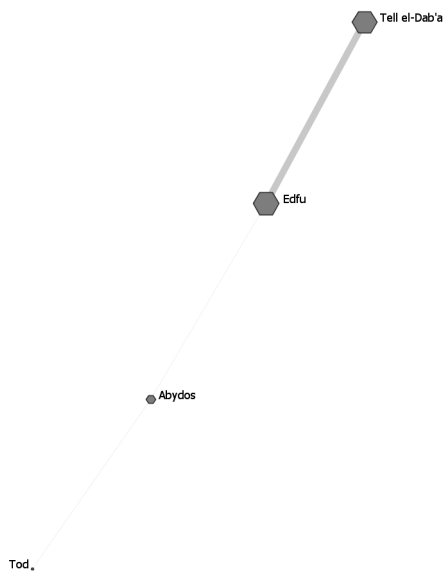


Figure 40: Eigenvector centrality of the first one-mode graph of the stone vessels during the ESIP.

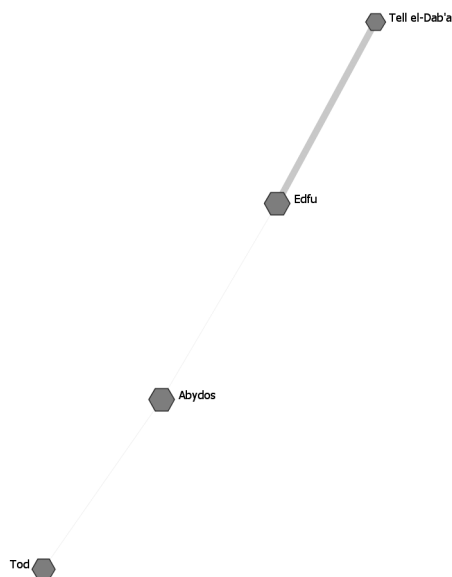


Figure 41: Closeness centrality of the first one-mode graph of the stone vessels during the ESIP.

The first one-mode graph

The first one-mode graph (Figures 38–41), based on the types of stone vessels shared between the sites, show stronger contacts between Tell el-Dab'a and Edfu. The latter is also connected to Abydos, which in its turn is connected to Tod. From the analysis of the centrality measures (Tables 31, 44, 57, 70 in Appendix II), it can be seen that Edfu always scores in the very high rank for all the measures, meaning that it was a major player in the network of stone vessels.

Moreover, Tell el-Dab'a, which has a high degree centrality and eigenvector centrality, is among the better-connected sites in the network of stone vessels, namely one of the sites with the more and stronger connections. At the same time, Abydos has a very high betweenness centrality, appearing thus like an intermediary in the network of stone vessels. Lastly, Qau el-Kebir, Tod and Ain Asil score low for all the measures, hence they do not create strong connections in the network, based on the available data.

The one-mode graph based on the Jaccard similarity

In this case too, the structure of the network based on the Jaccard similarity (Figures 42–45) is the same as the one detected in the first one-mode graph. Thus, the structure of the network does not change, whether only the shared

Qau el-Kebir.



Figure 42: Degree centrality of the second one-mode graph of the stone vessels during the ESIP.

Qau el-Kebir.



Figure 43: Betweenness centrality of the second one-mode graph of the stone vessels during the ESIP.

Qau el-Kebir.



Figure 44: Eigenvector centrality of the second one-mode graph of the stone vessels during the ESIP.

Qau el-Kebir.



Figure 45: Closeness centrality of the second one-mode graph of the stone vessels during the ESIP.

types or the full range of types is considered. The centrality measures (Tables 83, 96, 109, 122 in Appendix III) show that two of the sites examined, namely Ain Asil and Qau el-Kebir, sport the same low values in both graphs. This seems to confirm that they did not play any role in the network of stone vessels, at least based on the available data.

Tell el-Dab'a and Edfu feature the same values in both one-mode graphs, with high and very high ranks for all the measures but for the betweenness centrality of Tell el-Dab'a, which is in the very low rank. This puts them among the major players in the network of stone vessels.

Lastly, Abydos and Tod have different and higher scores in the second one-mode graph. In particular, the values of Abydos are all in the very high rank, while the values of Tod are all in the high rank but for the betweenness centrality, which is in the low rank. Thus, these sites seem to be more relevant in the network of stone vessels when the full range of stone vessels is examined. This situation derives from the fact that they have part of their material culture in common with the other sites, but not many of the most widespread types.

Summary

Tell el-Dab'a and Edfu appear to be the better-connected sites and the major players in the network of stone vessels, thus the sites where the lines of communication could start or end, and where new trends could also start.⁷⁴ Contacts between these sites are suggested also by other objects, such as stelae and scarabs.⁷⁵

At the same time, the roles of Abydos and Tod in the network of stone vessels are less clear. When only the shared types are considered, Abydos looks like an intermediary, thus where goods could be channelled through or pass by, hence a passageway or a (re)distribution centre.⁷⁶ At the same time, Tod seem not to play any particular role, on the basis of the available data. Nevertheless, when their full range of stone vessels is considered, both Abydos and Tod look like major players in the network, because the most common types are not a major part of the range of stone vessels that they have in common.

THE LATE SECOND INTERMEDIATE PERIOD

Even though the sites and contexts included in the analysis of the stone vessels of the Late Second Intermediate Period (Table 20 in Appendix I; Appen-

74 Östborn and Gerding 2015.

75 Ayers 2018; El-Sayed 1979; Moeller 2010; Moeller, Marouard, and Ayers 2011.

76 Gjesfeld 2015; Rivers, Knappett, and Evans 2013.

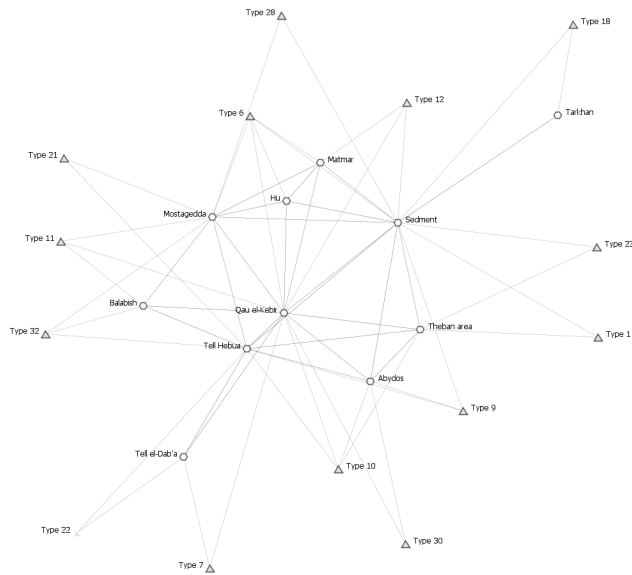


Figure 46: Contexts of the Late Second Intermediate Period and the most common stone vessels.

dix VIII) are more numerous than the ones of the Early Second Intermediate Period, they are still way fewer than the ones of the Late Middle Kingdom.⁷⁷ Among these sites, Tell el-Dab'a,⁷⁸ Qau el-Kebir,⁷⁹ and Abydos⁸⁰ are included in the analysis of both previous phases. On the contrary, Sedment,⁸¹ Tarkhan,⁸² Balabish,⁸³ the Theban area,⁸⁴ and Tell Hebua⁸⁵ appear in the analysis of the stone vessels for the first time. Lastly, Matmar⁸⁶ Mostagedda,⁸⁷ and Hu⁸⁸ have been included in the analysis of the stone vessels of the Late Middle Kingdom, but not of the Early Second Intermediate Period.

77 For an overview of stone vessels in the Second Intermediate Period: B.G. Aston 1994, 146–47.

78 Bietak, Mlinar, and Schwab 1991, 123–31, 177–80, 201; Forstner-Müller 2008, 245–99, 343–84; Forstner-Müller et al. 2015, 43; Hein, János, and Kopetzky 2004, 179.

79 B.G. Aston 1994, 146–47; Brunton, Gardiner, and Petrie 1930, 3–10 and pls. XX–XXI.

80 B.G. Aston 1994, 142–44; Peet 1914, 57–64; Randall-MacIver, Mace, and Griffith 1902, 67 and 97–101.

81 Petrie and Brunton 1924, 16–21 and pl. XLI.

82 Petrie 1914, 12.

83 Wainwright and Whittemore 1920, 8–12 and 33, pl. XIII.

84 Miniaci and Quirke 2009, 353–54; Petrie and Walker 1909, 7–8, 11.

85 Maksoud 1998, 248.

86 B.G. Aston 1994, 147; Brunton 1948, 56–58 and pl. XLII.

87 B.G. Aston 1994, 146–47; Brunton and Morant 1937, 114–22 and 128–29, pl. LXVIII.

88 Petrie and Mace 1901, 45–53.

As mentioned about the Early Second Intermediate Period, more burials of the Second Intermediate Period with stone vessels have been discovered in Abydos⁸⁹ and Qau el-Kebir,⁹⁰ and tombs of the Second Intermediate Period with vessels have been uncovered in Esna.⁹¹ However, these tombs have not been precisely dated to the Early or to the Late Second Intermediate Period, hence they could not be included in the analysis.

It can be remarked that, for Late Second Intermediate Period, Qau el-Kebir⁹² and Mostagedda⁹³ are the sites with the larger number of contexts with stone vessels, while Sedment,⁹⁴ the Theban area,⁹⁵ and Tell Hebua⁹⁶ are the sites with the larger variety of types, when related to the number of contexts. The contexts include nearly exclusively burial ones, while the few settlement contexts come only from Tell Hebua⁹⁷ and Tell el-Dab'a.⁹⁸

As far as the types of vessels found in the Late Second Intermediate Period are concerned, the most common are the vessels with squat shouldered body and folded-over or flaring rounded rim and outward or outward rounded base (types 6, 7, 11, and 12), which were common also in the Late Middle Kingdom and in the Early Second Intermediate Period. Moreover, during the Late Second Intermediate Period the vessels with flaring body and rounded rim and outward or outward rounded base (types 1 and 2) are also common, like in the Late Middle Kingdom. Other common types, also visible in Figure 46, are the vessels with squat shouldered body and flaring direct rim and outward or outward rounded base, the vessels with piriform or squat shouldered body and inward rim and outward base, the vessels with piriform body and flaring rounded rim and outward or flat base, the vessels with bag-shaped or drop-shaped body and flaring direct rim and flat or round (types 9, 10, 18, 22, 23, 25, 28, 29, 30, and 31); the last two types were common also during the Late Middle Kingdom.

Lastly, as far as the materials used for the stone vessels during the Late Second Intermediate Period are concerned, calcite-alabaster and anhydrite are the most common. Other materials from which stone vessels were produced,

- 89 B.G. Aston 1994, 142–44; Garstang, Newberry, and Milte 1901; Peet 1914, 57–64; Randall-MacIver, Mace, and Griffith 1902, 67 and 97–101.
- 90 B.G. Aston 1994, 146–47; Brunton, Gardiner, and Petrie 1930, 3–10 and pls. XX–XXI.
- 91 Downes 1974, 9–10 and 96–99.
- 92 B.G. Aston 1994, 146–47; Brunton and Morant 1937, 114–22 and 128–29, pl. LXVIII.
- 93 B.G. Aston 1994, 146–47; Brunton, Gardiner, and Petrie 1930, 3–10 and pls. XX–XXI.
- 94 Petrie and Brunton 1924, 16–21 and pl. XLI.
- 95 Miniaci and Quirke 2009, 353–54; Petrie and Walker 1909, 7–8, 11.
- 96 Maksoud 1998, 248.
- 97 Maksoud 1998, 248.
- 98 Bietak, Mlinar, and Schwab 1991, 123–31, 177–80, 201; Forstner-Müller 2008, 245–99, 343–84; Forstner-Müller et al. 2015, 43; Hein, Jánosi, and Kopetzky 2004, 179.

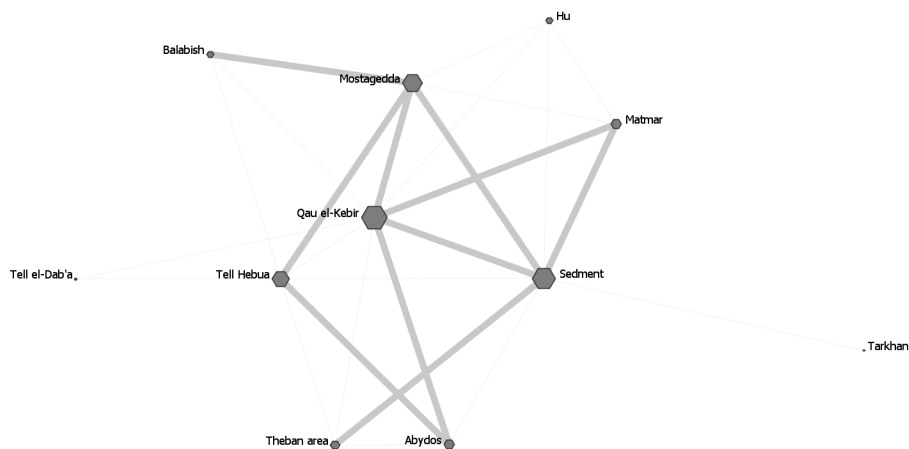


Figure 47: Degree centrality of the first one-mode graph of the stone vessels during the LSIP.

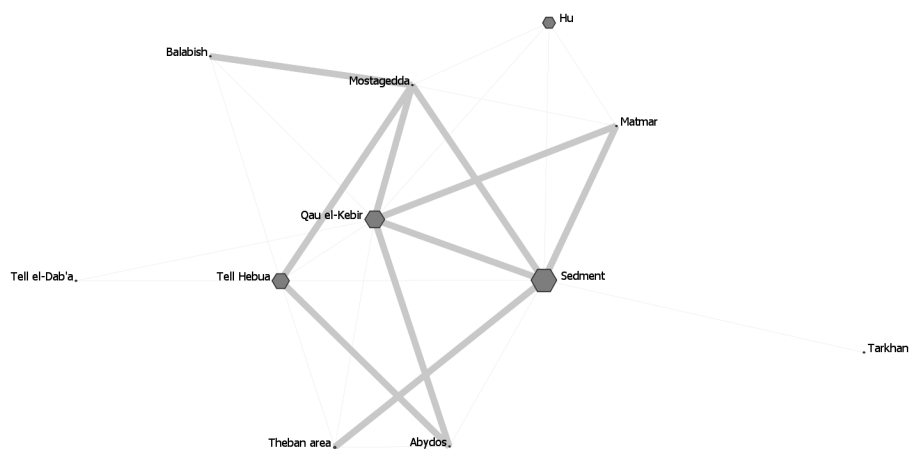


Figure 48: Betweenness centrality of the first one-mode graph of the stone vessels during the LSIP.

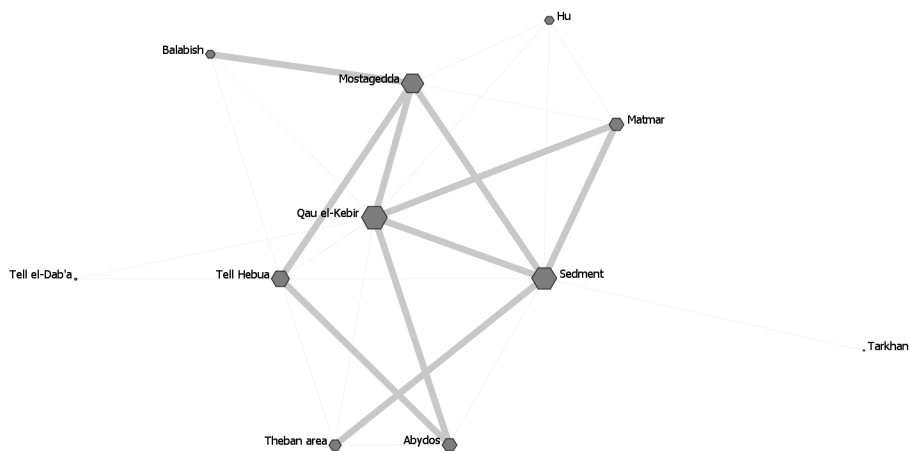


Figure 49: Eigenvector centrality of the first one-mode graph of the stone vessels during the LSIP.

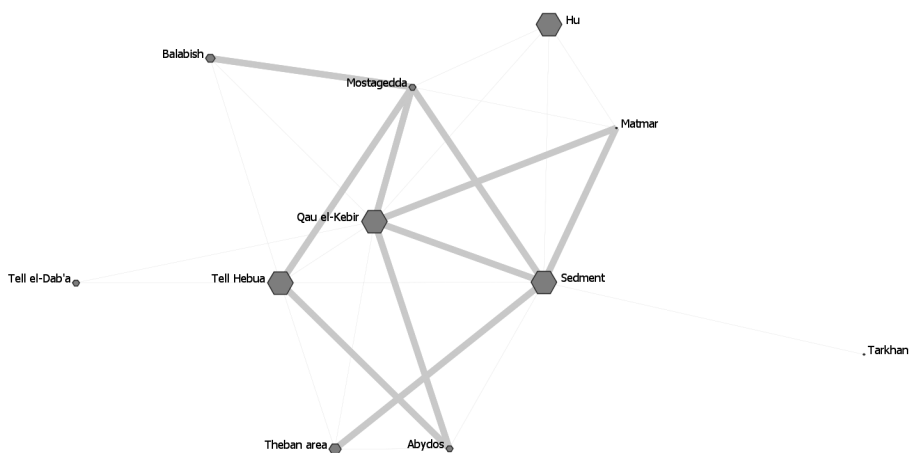


Figure 50: Closeness centrality of the first one-mode graph of the stone vessels during the LSIP.

though rarely, include serpentine, siltstone, sedimentary quartzite, and obsidian. Therefore, it can be noticed that during the Late Second Intermediate Period are found again some materials that were used during the Late Middle Kingdom, but not during the Early Second Intermediate Period.

The first one-mode graph

The first one-mode graph (Figures 47–50), which is based on the types of stone vessels shared between the sites, shows Sedment, Mostagedda, and Qau el-Kebir in a more central position in the network of stone vessels. The sites in Lower Egypt appear to be in contact with the sites in southern Upper Egypt mostly through the sites in Middle Egypt, especially through the mentioned sites. Nevertheless, during this phase the stronger contacts appear to be with the sites in southern Upper Egypt.

The centrality measures (Tables 33, 46, 59, 72 in Appendix II) show that the sites examined have a similar closeness centrality, which means that no remarkable difference can be detected concerning how reachable they are in the network of stone vessels. Furthermore, Sedment, Qau el-Kebir, and Tell Hebua score in all high or very high ranks for all the measures. Therefore, these sites appear like the major players and the main intermediaries in the network of stone vessels; Mostagedda is also among the better-connected sites in the network of stone vessels, namely the sites with the more and stronger connections, because its degree and eigenvector centrality are in the high rank.

All the other sites have lower score. A group of sites, including Matmar, Abydos, Hu, and the Theban area, score at most in the middle rank, which implies that they had a secondary role in the network of stone vessels. Moreover, another group of sites, including Tell el-Dab'a, Tarkhan, and Balabish sport all low or very low values, in other words they do not create strong connections in the network, based on the available data.

The one-mode graph based on the Jaccard similarity

The structure of the network in this one-mode graph (Figures 51–54) confirms the structure of the network detected in the previous one-mode graph. According to the centrality measures (Tables 85, 98, 111, 124 in Appendix III), half of the sites, including Tell el-Dab'a, Sedment, Tarkhan, Qau el-Kebir, Balabish, Abydos, and the Theban area, score in similar ranks in both graphs, with small variations that do not alter the overall pattern. Hence, Sedment and Qau el-Kebir are among the major players in the network of stone vessels, while Abydos and the Theban area still score at most in the middle rank. At the same time, Tell el-Dab'a, Tarkhan, and Balabish still score in low or very

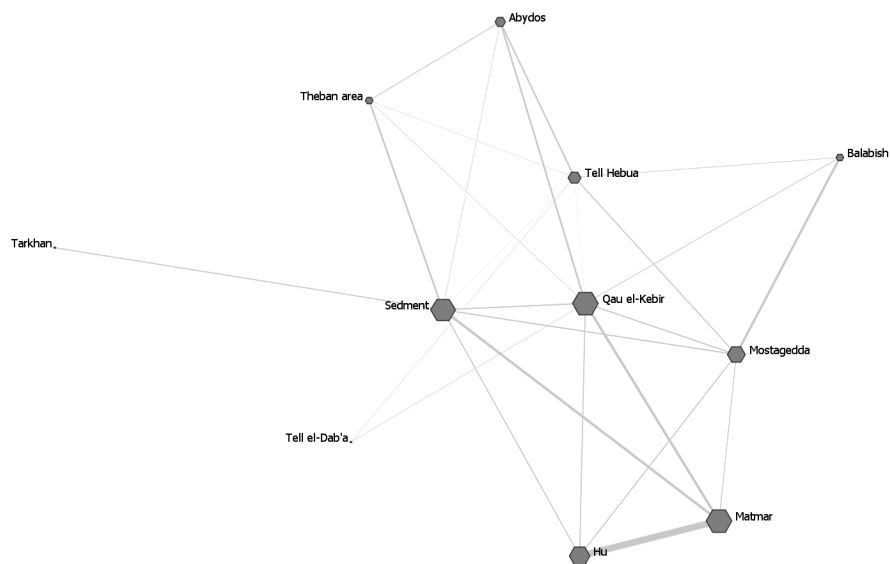


Figure 51: Degree centrality of the second one-mode graph of the stone vessels during the LSIP.

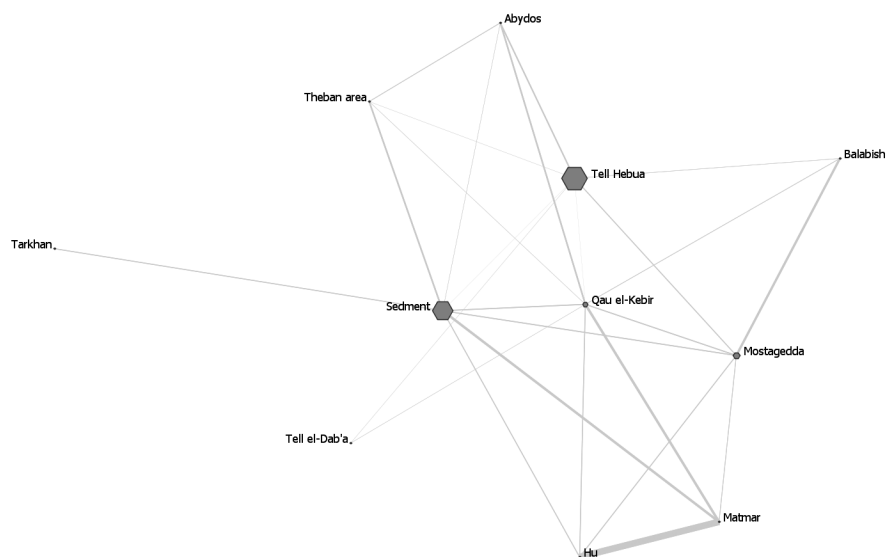


Figure 52: Betweenness centrality of the second one-mode graph of the stone vessels during the LSIP.



Figure 53: Eigenvector centrality of the second one-mode graph of the stone vessels during the LSIP.



Figure 54: Closeness centrality of the second one-mode graph of the stone vessels during the LSIP.

low rank, which shows no role for these sites in the network of stone vessels, at least according to the available data.

The sites of Matmar and Mostagedda have slightly different scores in the present graph. In detail, the eigenvector centrality of Mostagedda is lower than in the previous graph, meaning that its connections to the major players of the network of stone vessels look better when only the shared types are considered. This originates from the fact that this site, although it did not have a great part of its range of stone vessels in common with the other sites, many of the most common types were included in this part. At the same time, Matmar and Hu have higher values in the second one-mode graph, especially for the degree and the eigenvector centrality: this means that they appear more prominent when their full range of stone vessels is considered, because they did not have in common with the other sites many of the most widespread types.

Lastly, Tell Hebua scores in the very high rank for the betweenness centrality and the closeness centrality, therefore like an important intermediary. The difference is due to the part of stone vessels that these sites shared with the other sites, if and how it included the most common types.

Summary

It can be noticed that Sedment, Qau el-Kebir score mostly high values, while Mostagedda has a high degree and eigenvector centrality: these features put them among the major players in the network of stone vessels. Thus, they could be the starting and ending points in the lines of communications, and where the new trends could be spread from.⁹⁹ Matmar and Hu were probably also among the better-connected sites, namely sites with many and strong connections, in the network of stone vessels.

Concerning Tell Hebua, it is among the major players, as well as an intermediary, in the network of stone vessels when only the shared types are considered, so when the common types have more influence on the analysis. On the contrary, when their full range of stone vessels is considered, thus when the common types have less influence, it looks like an important intermediary. Therefore, Tell Hebua could be among the better-connected sites and/or could be site where goods were distributed from or were flowing through, namely passageways or (re)distribution centres.¹⁰⁰

99 Östborn and Gerding 2015.

100 Gjesfeld 2015; Rivers, Knappett, and Evans 2013.

THE CORRESPONDENCE ANALYSIS

The tool of correspondence analysis has been used also for the stone vessels, to study the relations between the variety of types retrieved at the sites and how the same sites score for the different measures in both one-mode networks detected in this chapter. The results (Appendix IV) show that the sites with the largest number of types of stone vessels tend to have higher scores for the degree centrality and the eigenvector centrality, probably because of the lower amount of data included in the analysis of the stone vessels; the betweenness centrality is not affected. This tendency is visible especially for the Early Second Intermediate Period, which has also contributed fewer data to the analysis, compared to the other phases examined in the present work. Nevertheless, the relationship between largest number of types and high scores for the measures is not univocal. In other words, having a larger number of types could mean higher scores, but not necessarily so.

The scores detected for the graph based on the Jaccard similarity seem even less dependent on the number of types of stone vessels found on sites. Hence, even if caution is required, because of the described tendency and the danger of archaeological bias, the correspondence analysis shows again that the measures calculated in the network analysis are not inescapably biased by the number of objects or types found on the sites.

CONCLUDING REMARKS

During the Late Middle Kingdom, the sites that seem to play a major role in the network of stone vessels are Harageh, Rifeh, Abydos, Hu, Esna, and Edfu. This means that these were the places where the stone vessels could be produced and send from or sent to. The sites of Dahshur, Riqqeh, Hawara, Lahun, Qasr el-Sagha, and Ballas probably also belonged to this group, though they did not share many of the most common types.

It seems plausible to find the major players in the Memphis-Fayyum area and in Middle and southern Upper Egypt, considering that most resources come from the central and southern Eastern Desert and that the capital was located in the Memphis-Fayyum area.¹⁰¹ Nevertheless, the structure of the network shows that the connections were mostly between the sites in the Memphis-Fayyum area and in Middle Egypt, and between them and the sites in southern Upper Egypt. Thus, the contacts were happening mostly through the sites in Middle Egypt. At the same time, the sites of Matmar, Qau el-Kebir, and Denderah appear to be passageways or (re)distribution centres in the network of stone vessels, implying that stone vessels would be channelled

101 Agut and Moreno-García 2016, 249–53.

through these places on their way to their destination, or that they were (re) distributed from there.

Concerning the network detected based on the materials used for the stone vessels during the Late Middle Kingdom, calcite-alabaster and obsidian are the only materials that create connections, because there are types of vessels shared between sites. All the other materials do not create connections because there are no types shared between sites. Among these materials, siltstone and diorite are found near their sources, meaning near the locations where they were mined or entered Egypt when imported. On the contrary, materials such as basalt, haematite, steatite, serpentine, marble, and lapis lazuli are found far from their sources. Other materials, including anhydrite, carnelian, quartz, sedimentary quartzite, and limestone, are commonly found in Egypt. Especially for the materials commonly found, the fact that there are no types shared could suggest a localized production.

During the Early Second Intermediate Period, the stronger contacts in the network of stone vessels are between Tell el-Dab'a and Edfu, while the latter is also connected to Abydos and, through this, to Tod. Thus, Tell el-Dab'a and Edfu appear to be the places where the stone vessels would be made and shipped from, or destined to. The relevance of these sites and exchanges between them are visible also in other sources, especially sealings.¹⁰² At the same time, Abydos appears like a passageway/(re)distribution centre or a major player in the network, depending on if only the share typed or the entire range of stone vessels is considered, while Tod is a main player only when its entire range is considered.

Concerning the materials used for the stone vessels during the Early Intermediate Period, the only one that creates connections, because there are types shared, is calcite-alabaster. Therefore, these contacts are the ones described at the beginning of this section. Other materials are found rarely, in few sites and contexts, and do not create any connections. Among them, quartz is commonly found in Egypt, though quartz vessels are found only in Tell el-Dab'a. Serpentine is found near its sources, meaning the places where it was mined, while siltstone and haematite are found far from their sources. However, the vessels are too few to understand how the materials or the same vessels arrived at the sites.

During the Late Second Intermediate Period, the sites in Lower Egypt appear to be in contact with the sites in southern Upper Egypt mostly through the sites in Middle Egypt; and the stronger contacts appear to be with the sites in southern Upper Egypt. These connections are also the ones detected when the circulation of the vessels of calcite-alabaster is examined. The sites of Tell

102 Ayers 2018; Moeller, Marouard, and Ayers 2011.

Hebua, Sedment, Mostagedda, and Qau el-Kebir are the possible producers and senders or receivers in the circulation of stone vessels. At the same time, Tell Hebua also played the role of an intermediary. Hu and Matmar appear as main players in the network of stone vessels only when the full range of types is considered. The materials other than calcite-alabaster create no connections because there are no types in common, and all in all the vessels are few and come from very few contexts. Among these materials, siltstone and anhydrite are found near their sources, meaning the places where they were mined or where they entered Egypt when imported, while serpentine and obsidian are found far from their sources. Lastly, sedimentary quartzite and limestone are commonly found in Egypt. The fact that there are no types shared could again imply a localized production, though more data are needed to substantiate this hypothesis.

SCARAB AND SEAL DESIGNS

The present chapter analyses the designs incised on the base, namely on their flat area that is in contact with the supporting surface, of scarabs and seals. Scarabs were usually beetle-shaped, while seals were not only beetle-shaped, but also cylindrical, or rectangular, or shaped like cowrie shells.¹ Seals were impressed, on the part of their base, on clay on vessels and other containers such as wooden boxes, baskets, to authenticate and seal off their contents when they were transported or went into storage; they were also impressed on documentation on papyri and ostraca, and on doors when these needed to be sealed.² The impressions left on these clay sealings, which because of their use are found mostly in settlement contexts,³ are also included in the analysis, because the designs used are similar to the ones incised on scarabs and seals.

For both the Late Middle Kingdom and the Second Intermediate Period, scarabs used in administration bear also official titles and names or royal names.⁴ These scarabs allow to reconstruct the administrative system, that was still centralized during the Late Middle Kingdom, which was actually when their large-scale use started.⁵ The scarabs used for administrative purposes during the Second Intermediate Period are in a much smaller number.⁶ Especially when bearing royal names, scarabs have been used for dating purposes.⁷ Nevertheless, for both royal and non-royal scarabs and seals, there

1 See examples in: Martin 1971.

2 Bietak 2004; Collon, Lehmann, and Müller 2013; Marée 2013; Martin 1971; Martin 2004; Reali 2013; Tufnell 1975.

3 Ben-Tor 2007; Hayes 1953, 191; Martin 1971; Petrie, Brunton, and Murray 1923, pls. LXIII–LXV; Petrie et al. 1891, pls. VIII–X; Tufnell 1975; Von Pilgrim 1996, figs. 98–104.

4 Ben-Tor 2007, 36–41, 103–12; Ben-Tor 2010; Bietak 2004; Krauss 1996; Martin 1971; Quirke 2004; Quirke 2007; Ryholt 1997, 34–65.

5 Ben-Tor 2007, 5–7; Martin 1971; Williams 1977, 136–37.

6 Ben-Tor 2004, 33; Ben-Tor 2007, 44–48; Quirke 2004; Von Pilgrim 1996, 303–8; Wegner, Smith, and Rossell 2000.

7 Ben-Tor 2004; Ben-Tor 2010; O'Connor 1985; Krauss 1996; Ryholt 1997, 34–65; Ryholt 2010; Wegner 2004.

is always the possibility of heirlooms and fossils, namely scarabs found in contexts later than the date of their production and use.⁸

Scarabs, sometimes mounted on gold rings, could function also as amulets, thus with religious purposes, and as such are especially found in funerary contexts as burial equipment, thus as funerary scarabs and carrying funerary epithets.⁹ Their large use as funerary scarabs also started during the Late Middle Kingdom, likely because changes in burial customs created the need for relatively cheap and easily accessible apotropaic objects.¹⁰ Amulets, bearing the same designs as the ones found on scarabs, were often shaped as cowroids, namely cowrie-shells with a flat base.¹¹ During the Second Intermediate Period, when funerary and amulet scarabs were more common than the administrative ones,¹² these amulets were shaped also like double or multiple scarabs, namely two or more scarabs joined at their sides,¹³ or other animals such as hedgehogs.¹⁴ These amulets have also been included in the present analysis, because the designs they bear are informative.

Both administrative and funerary scarabs were widely distributed during the Late Middle Kingdom; they also bear similar motifs. This further suggests a centralized administration and centralized distribution, that is to say that scarabs were mostly produced in the area of the capital and distributed from there.¹⁵ For the Second Intermediate Period, the similarity to Canaanite scarabs, as well as the presence of Canaanite scarabs, has been noted, especially in the Eastern Delta.¹⁶ This shows a regional tradition of the area, from where most of the scarabs of the period come from.¹⁷ The presence of a scarab workshop in Tell el-Dab'a during the Second Intermediate Period has also been demonstrated, on the basis of the peculiar features of the scarabs unearthed at the site: the way their head, back, legs and designs are realized shows a characteristic local style, which differs between the Early and the Late Second Intermediate Period and suggests the existence of two different

8 See various examples in: Ben-Tor 2007; Mlinar 2001b.

9 Ben-Tor 2007, 5; Ward and Bishara 1978, 43–47.

10 Ben-Tor 2007, 5–6; Bourriau 1991a.

11 See examples in: Ayrton et al. 1904; Ben-Tor 2007; Brunton, Gardiner, and Petrie 1930; Brunton and Morant 1937; Downes 1974; Engelbach et al. 1915; Mlinar 2001b; Petrie and Brunton 1924; Petrie, Quibell, and Spurrell 1896; Petrie, Thompson, and Crum 1907.

12 Ben-Tor 2007, 44–47.

13 See examples in: Ben-Tor 2007; Miniaci 2011; Miniaci and Quirke 2009.

14 See examples in: Ben-Tor 2007; Bietak, Mlinar, and Schwab 1991; Mlinar 2001b; Petrie and Brunton 1924.

15 Ben-Tor 2007, 5–6; Martin 1971; Williams 1977, 136–38.

16 Ben-Tor 2004; Ben-Tor 2007, 43 and 113; Mlinar 2001a; Mlinar 2004; Sartori 2009.

17 Ben-Tor 2007, 113.

workshops in the two phases.¹⁸ The existence of a Theban workshop, whose scarabs resemble the ones of the early part of the Middle Kingdom,¹⁹ during the Second Intermediate Period has also been suggested, but only royal scarabs can be attributed to that with certainty.²⁰ This scarabs was mostly likely active during the Late Second Intermediate Period, as demonstrated by the fact that the royal scarabs attributed to this workshop bear names of kings of the Seventeenth Dynasty.²¹

The fact that administrative and funerary scarabs bear similar motifs, and are not clearly distinguished, also demonstrate that the use of scarabs was interchangeable.²² Because the function of the same scarab could indeed vary over time, items were kept for more generations, because they were still in use, or reused, or kept as heirlooms, ending up in contexts later than their date of production and use.²³ Considering that most scarabs have been found in tombs, this means that the tombs can date to a period later than the period when the scarabs were made. In the present work, heirlooms and fossils are included in the analysis, because the aim is to study the material culture in use during the Late Middle Kingdom and the Second Intermediate Period. Moreover, scarabs were used in jewellery items such as necklaces and bracelets. These items are found mostly in burial contexts, because were used as funerary equipment. However, scarabs used as amulets and beads, and not bearing designs, have been included in the analysis of the beads.

Typologies of scarabs have been elaborated based on the shape of the head, the back, and the side,²⁴ and on how naturalistic or stylized they look. The head includes: the clypeus, namely the broad plate at the front of the head; the plates at the sides of the clypeus; the eyes. The back includes the thorax, namely the upper part of the back, and the two elytra, namely the two hardened forewings that protect the membranous hind wings of the beetles. On the side are represented the legs of the insect. Naturally, including also these features in the analysis would have been more informative than examining only the designs visible on the base.²⁵ However, not enough published information is available to allow for such an analysis. The designs visible on the base of scarabs and on seals have been specifically represented in pub-

18 Bietak, Forstner-Müller, and Mlinar 2001; Mlinar 2001b; Mlinar 2004.

19 Ben-Tor 2007, 113.

20 Ben-Tor 2007, 113; Quirke 2004.

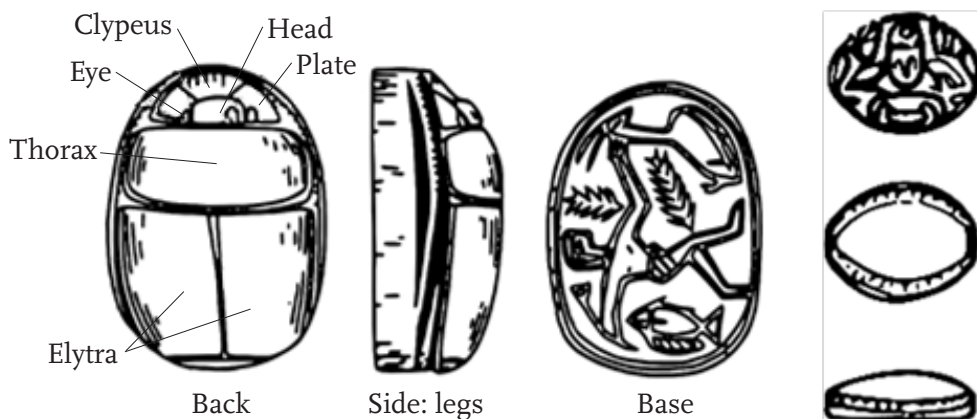
21 Ben-Tor 2007, 110–13.

22 Ben-Tor 2007, 5–8; Williams 1977, 136–38.

23 Ben-Tor 2004, 28; Ben-Tor 2007, 5–7; Williams 1977, 136–38.

24 Mlinar 2004; Tufnell, Martin, and Ward 1984; Ward and Bishara 1978.

25 As an example, Mlinar has been able to detect the presence of a local workshop of Tell el-Dab'a based on these features: Mlinar 2001b, Mlinar 2004.



Drawing 2 (left): Main parts of a scarab. Drawing after Ben-Tor 2007.

Drawing 3 (right): Example of a cowroid seal. Drawing after Ben-Tor 2007.

lications, or are visible in the pictures of scarabs and seals.²⁶ Collections of scarabs and seals, as well as of impressions left on sealings, have also been published.²⁷ The typology adopted in most of these collections does not variate much,²⁸ and has been followed also in the present work.²⁹

Between the Late Middle kingdom and the Second Intermediate Period there are differences concerning which scarab and seal designs are more common and how they look like, as well as how the different parts of the scarabs, i.e. the head and the back and the sides, are made.³⁰ The size of the scarabs has also been taken into account to study their development during these chronological periods.³¹ It has been suggested that in time they become smaller, so that the larger they are, the earlier they are; however, this suggestion has been criticized on the basis of scarabs that can be dated with certainty, which show that later scarabs are not always smaller than earlier ones.³²

26 See, for example in the publications of Lahun, Esna, and Tell el-Yahudiyah: Downes 1974, 56–66; Griffith 1890, pl. X; Petrie, Brunton, and Murray 1923, pls. LXIII–LXV; Petrie and Duncan 1906, pls. VI–IX; Petrie, Griffith, and Newberry 1890, pl. X; Petrie et al. 1891, pls. VIII–X.

27 Ben-Tor 2007; Martin 1971; Martin 2004; Newberry 1906; Newberry 1907; Tufnell 1975; Tufnell, Martin, and Ward 1984.

28 This typology has been combined with a typology based on the way the head, the back, and the legs are executed in: Mlinar 2001b; Tufnell, Martin, and Ward 1984; Ward and Bishara 1978.

29 In detail, the typology followed in the present analysis is the one found in: Ben-Tor 2007.

30 Ben-Tor 2007, 41 and 102–13; Martin 1971; Mlinar 2001b; Tufnell, Martin, and Ward 1984.

31 Tufnell 1975; Tufnell, Martin, and Ward 1984; Ward and Bishara 1978.

32 Ben-Tor 2007, 9; Ryholt 1997, 34–65.

This shows that the distinction is not always straightforward, and problems especially arise when scarabs are found in contexts where archaeological material from different chronological periods are mixed together.³³ Moreover, no distinction has been made between the scarabs of the Early and of the Late Second Intermediate Period.³⁴ Lastly, only published material has been used for the present research, and the quality of the data published is often not good enough for using scarabs for dating purposes. Therefore, only contexts that have been clearly dated to one of the three chronological phases analysed through other means have been examined, while undated contexts have been excluded and no attempt to dating them through designs has been made.

Furthermore, for part of the scarabs and seals, whose design can be dated to the periods relevant to the present research, the original context is not known, because they have been acquired by museums and the original context is unknown,³⁵ or because they come from secondary deposits, where they were discarded after having been used.³⁶ Designs from these scarabs and seals are not included in the analysis, because they are not informative as far as the relationships between sites are concerned. Therefore, only designs from scarabs and seals from dated archaeological contexts have been examined.

Nevertheless, finding similar designs at two sites does not necessarily mean that these sites were in direct contact, nor that the designs were specifically brought by somebody from one site to another. It only means that these sites shared a similar style of material culture, which could reach them in a more indirect way.³⁷ This is due to the fact that the archaeological bias and the difficulty in dating part of the contexts deprives us of data and, therefore, of the possibility to reconstruct a precise line of direct contacts.³⁸

Finally, scarabs and seals were nearly always made of steatite or faience:³⁹ the materials used were standardized or locally procured. Therefore, the connections created through the occurrence of steatite and faience scarabs are not very informative or meaningful and have not been analysed. Other materials used to produce scarabs and seals, such as amethyst, jasper, feldspar, lapis lazuli, turquoise, and obsidian, have a specific source or a rarely found or imported. Hence, they have been examined to study the networks that their occurrence creates.

33 Ben-Tor 2007, 6–7, 44–45.

34 Not even in Ben-Tor's publication.

35 See examples in: Newberry 1906; Newberry 1907; Petrie 1917.

36 Ben-Tor 2007, 6–7; Bietak 2004; Von Pilgrim 1996, 254–61; Wegner 1998.

37 Brughmans 2013, 638–39; Sindbæk 2007b, 66; Sindbæk 2013, 74–76, 82.

38 Sindbæk 2013, 72.

39 Tufnell, Martin, and Ward 1984, 38–42; Petrie 1917, 8–9.

<i>Design type</i>	<i>Description</i>	<i>Outline</i>
1E – Floral motifs – 2-stem papyrus	This type represents two papyrus plants flanking a central motif or stemming from spirals. Sometimes, two pairs of papyrus plants are represented on the sides of a central motif. This design can be shown twice, mirrored, or be associated with other hieroglyphs.	
1E – Floral motifs – 3-stem papyrus	This type displays three papyrus plants, one at the centre and one bending at each side. This design can be shown mirrored or be associated with other hieroglyphs.	
1E – Floral motifs – lotus flower	This type depicts a lotus flower, sometimes associated with a papyrus plants or with other hieroglyphs. This design can also be shown twice, mirrored.	
2A – Un-linked scrolls and spirals	This type shows one or multiple separate scrolls or spirals, which can be oriented vertically or horizontally. The extremities of the spirals and scrolls can be more rounded or more elongated, and can rolled in opposite directions, creating an S-shape, or towards each other. This design can be associated with other hieroglyphs.	
2B – Interlocking scrolls and spirals	This type portrays multiple scrolls and spirals, oriented vertically and horizontally and, sometimes, diagonally. The extremities of the spirals and scrolls are connected, can be more rounded or more elongated, and be rolled in opposite directions, creating an S-shape, or in towards each other. Not often, this design can be associated with other hieroglyphs.	
3A1 – sign of union	This type displays the sign of union of Lower and Upper Egypt (sma tawy), namely intertwined papyrus plants and lotus flowers. It can be associated with other hieroglyphs.	
3A2 – nbty design	This type depicts the nbty, namely two nb signs indicating Wadjet and Nekhbet, respectively the cobra goddess of Lower Egypt and the vulture goddess of Upper Egypt, showing the unity of Egypt. It can be represented vertically or horizontally and is usually associated with other hieroglyphs.	

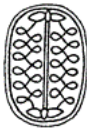
(continued)

<i>Design type</i>	<i>Description</i>	<i>Outline</i>
3A3 – varia	This type combines different hieroglyphs, written one or more times, though, these are not used to create meaningful sentences. The hieroglyphs can be oriented vertically or, less often, horizontally.	
3A4 – Horus hawk	This type shows the signs for the Horus hawk, namely a sitting hawk seen from the side, combined with other hieroglyphs. This design can be oriented horizontally or vertically.	
3B1c var.1 – Cobras confronted on columns of hieroglyphs	This type represents two cobras facing each other, at the top of two columns of identical hieroglyphs. A third column of hieroglyphs can be written in the centre. This design is oriented vertically and can be combined with other designs of type 3B.	
3B1c var.2 – Cobras confronted with winged sun disk	This type portrays two cobras facing each other, with one or more hieroglyphs between them, above a winged sun disk. This design is combined with other hieroglyphs and other designs of type 3B and is oriented vertically.	
3B1c var.3 – Cobras confronted longitudinally	This type shows two cobras facing each other, with one or more hieroglyphs between them, oriented horizontally. This design is combined with other hieroglyphs and other designs of type 3B.	
3B2 – nsw-bft	This type shows the sedge plant and the bee, which form the title King of Lower and Upper Egypt. This design is combined with other hieroglyphs and is oriented vertically.	
3B3a – Red crowns ad-dorsed on nb	This type displays two red crowns with the back towards each other, each of them on a nb sign. This design can be oriented horizontally or vertically and is combined with other hieroglyphs and other designs of type 3B and, rarely, 1E, 2B, and 3A1.	
3B3b – Red crowns ad-dorsed	This type represents two red crowns with the back towards each other. This design can be oriented horizontally or vertically and is combined with other hieroglyphs and other designs of type 3B and, rarely, 2A and 6A.	

(continued)

<i>Design type</i>	<i>Description</i>	<i>Outline</i>
3B3c – Red crowns confronted	This type depicts two red crowns facing each other, which can be on nb sign or not. This design can be oriented horizontally or vertically and is combined with other hieroglyphs and other designs of type 3B and, rarely, 7B.	
3B3e – Red crowns tête bêche	This type portrays two red crowns, which can be on nb sign or not, in opposite directions. This design is oriented horizontally and is combined with other hieroglyphs and other designs of type 3B, 3C and, rarely, 2A.	
3B4 – Horus eyes	This type depicts two eyes of Horus, combined with other hieroglyphs and other designs of type 2A, 2B, 3B and, rarely, 1E and 8A. This design can be oriented horizontally or vertically.	
3B5 – Sedge plants	This type represents two sedge plants, facing each other or, less commonly, looking away from each other. This design can be oriented vertically or, less commonly, horizontally. It is combined with other hieroglyphs and other designs of type 3B and, rarely, 1E.	
3B6 – Gold sign longitudinal	This type displays the sign for gold, nwb, oriented horizontally or, rarely, vertically. This design is combined with other hieroglyphs and other designs of type 1E and 3B and, rarely, 7B.	
3B7 – Forepart of lions	This type shows twice the forepart of a recumbent lion. The two foreparts usually look away from each other, and rarely face each other, or are mirrored, or are oriented in opposite directions. This design can be oriented vertically and, less commonly, horizontally. It is combined with other hieroglyphs and other designs of type 3B and, more rarely, 1E, 7B and 8A.	
3C – Formulae	This type portrays Egyptian formulae, mostly related to the sun-god Ra. The formulae are usually written in a column, which can be oriented vertically or horizontally and can be flanked by other hieroglyphs. To this type belongs also the so-called anra type, which is typical of the Second Intermediate Period and takes its name from the hieroglyphs used to write it.	

(continued)

<i>Design type</i>	<i>Description</i>	<i>Outline</i>
3D1 – Cartouches simplified	This type represents an oblong ring enclosing a column of hieroglyphs, which can be flanked or encircled by other hieroglyphs. This design can be oriented vertically or horizontally, and is be combined with designs of type 3B, 6A, 7A and, rarely 4.	
3D2 – Actual cartouches	This type shows a real cartouche, flanked, or encircled by other hieroglyphs. This design can be oriented vertically or horizontally, and is be combined with designs of type 3B, 6A, 7A and, rarely 4.	
3E1 – Panels	This type displays three columns of hieroglyphs, each separated by one or two lines. This design is oriented vertically.	
3E2 – Panels with two signs in margins	This type depicts three sections, of which the outer ones have two hieroglyphs, and the middle one has a design of type 3C or 6C. This design is oriented vertically.	
3E4 – Panels with crossbars in margins	This type depicts three sections, of which the outer ones have horizontal lines, and the middle one has a design of type 3C or 6C. This design is oriented vertically.	
4 – Circles	This type portrays two to multiple circles, which can sometimes be combined with other signs or encircle a column of hieroglyphs, oriented vertically.	
5 – Crosses	This type represents crosses, usually made of a horizontal element, a vertical element crossing it and a coil in each of the corners formed by the cross. It can be combined with designs of type 2A.	
6A1 – Single line thread	This type displays a thread drawn with a single, continue line. It can be combined with other hieroglyphs or designs of type 2A, 2B and, less commonly, 1E and 3B. This design can be oriented vertically or horizontally.	

(continued)

<i>Design type</i>	<i>Description</i>	<i>Outline</i>
6A2 – Single line loops	This type shows separate loops, drawn with a single line and usually on multiple rows, which are sometimes mirrored. It can be oriented horizontally or vertically, and combined with designs of type 1E, 2A, 2B. This design can be oriented vertically or horizontally.	
6B1-2 – Convoluted coils	This type portrays coils and threads made of double lines. It can be oriented vertically or horizontally and can be combined, not commonly, with hieroglyphs and with designs of type 1E and 8A.	
6B3 – Convoluted coils, varia	This type depicts coils and threads made of double lines, departing from a central point but connected less homogeneously than in type 6B1-2. It can be oriented vertically or horizontally.	
6C1 – Encompassed coils with central x cross	This type shows coils and threads made of double lines, departing from a central point but connected less homogeneously than in type 6B1-2. It can be oriented vertically or horizontally.	
6C2 – Encompassed coils with central twist	This type represents coils and threads made of double lines, departing from a central horizontal or vertical line twisted in the middle.	
6C3 – Encompassed coils with central cable	This type portrays double-line coils and threads, departing from a central column made of twisted double-line threads. It can be oriented vertically or horizontally, and it is sometimes combined with hieroglyphs or designs of type 1E, 3B, 3C, and 3E4.	
7A1 – Continuous scroll border with round scrolls	This type displays a frame made of continuous, interlocking rounded coils. In the centre can be written loose hieroglyphs, cartouches and royal names, titles and names of officials and their family members and, rarely, designs of type A2. It is oriented vertically.	
7A2 – Continuous scroll border with oblong scrolls	This type depicts a frame made of continuous, interlocking elongated coils. In the centre can be written loose hieroglyphs, cartouches and royal names, non-royal titles and names and, rarely, designs of type 8A. It is oriented vertically.	

(continued)

<i>Design type</i>	<i>Description</i>	<i>Outline</i>
7B1 – Paired scroll, one pair	This type portrays a frame made of a continuous single line creating one coil at each of two opposite ends. In the centre can be written loose hieroglyphs, cartouches and royal names, non-royal titles and names and, rarely, designs of type 3B. It can be oriented vertically or horizontally.	
7B2 – Paired scroll, two pairs	This type represents a frame made of a continuous single line creating two interlocking coils on the long sides. In the centre can be written loose hieroglyphs, cartouches and royal names, and non-royal titles and names. It is oriented vertically.	
7B3 – Paired scroll, three pairs	This type shows a frame made of a continuous single line creating three interlocking coils on the long sides. In the centre can be written loose hieroglyphs, cartouches and royal names, and non-royal titles and names. It is oriented vertically.	
7B4 – Paired scroll, four or more pairs	This type displays a frame made of a continuous single line creating four or more interlocking coils on the long sides. In the centre can be written loose hieroglyphs, cartouches and royal names, and non-royal titles and names. It is oriented vertically.	
7C – paired scrolls, open	This type depicts a frame made of a single line, creating interlocking coils on the long sides and open on one or both short sides. The open ends are sometimes shaped like cobras or papyrus. In the centre can be written loose hieroglyphs, cartouches and royal names, and non-royal titles and names. It is oriented vertically.	
8A – Rope border with twisted strand	This type portrays a rope-like frame, which can be single or double. In the centre can be written loose hieroglyphs, cartouches and royal names, non-royal titles and names, and, more rarely, designs of type 1E, 3B, 6B, 6C, 10B. It can be oriented vertically or horizontally.	
8C – Rope border with full twisted cable	This type shows a frame made of a twisted multiple line. In the centre can be written loose hieroglyphs, cartouches and royal names, and non-royal titles and names. It is oriented vertically.	
9B – Antelopes	This type displays an antelope, sometimes combined with other designs of type 9 and 10. It is oriented horizontally.	

(continued)

<i>Design type</i>	<i>Description</i>	<i>Outline</i>
9C – Animals, cobras confronted	This type depicts two cobras facing each other. It is combined with hieroglyphs or other designs of type 3, 9 and 10 and can be oriented horizontally or vertically.	
9D – Animals, crocodiles	This type represents a crocodile. It is often combined with other designs of type 9 and 10 and can be oriented horizontally or vertically.	
9E – Animals, lions	This type portrays a lion. It is combined with hieroglyphs or other designs of type 9 and 10 and can be oriented horizontally or vertically.	
9F – Animals, heraldic beasts	This type depicts animals in heraldic poses, namely standing and with symbols of power. It is combined with hieroglyphs or other designs of type 9 and 10 and can be oriented horizontally or vertically.	
10A – Standing figure	This type shows a standing human figure, with human or animal head. Sometimes, royal figures or deities, such as Hapy, Ptah, or Hathor, are represented. The figure can be still or shown in actions such as holding symbols of life or power or walking or smiting an animal. The figure can be accompanied by an inscription or the background of the scene. This type can be combined with other designs of type 9. It can be oriented horizontally or vertically.	
10B – More figures	This type represents two standing human figures, with human or animal head and usually facing each other. This type can be combined with hieroglyphs and designs of type 3B, 7B, and 10D. It can be oriented horizontally or vertically.	
10C – Kneeling figure	This type displays a kneeling human figure, with human or animal head. It is combined with other hieroglyphs and designs of type 3B and 7B. This design can be oriented horizontally or vertically.	
10D1 – Standing goddess	This type depicts a standing female figure with the head commonly used to depict the goddess Hathor. It can be oriented horizontally or vertically.	

(continued)

<i>Design type</i>	<i>Description</i>	<i>Outline</i>
10D2 – Hathor symbol	This type represents only the head commonly used to depict the goddess Hathor. It is combined with hieroglyphs and with designs of type 1E, 2A, 2B, 3B, 10B. This design can be oriented vertically or horizontally.	

Table 3: Description and outline of the main types of scarab and seal designs. The designs are drawn after Ben-Tor 2007 and Mlinar 2001b.

THE LATE MIDDLE KINGDOM

As far as the contexts with scarab and seal designs included in the analysis of the Late Middle Kingdom are concerned (Table 9 in Appendix I; Appendix VI), Harageh,⁴⁰ Qau el-Kebir,⁴¹ Abydos,⁴² Tell el-Dab'a,⁴³ and Esna⁴⁴ are the sites with the highest number of contexts, as well as with the greatest variety of types.⁴⁵ Common burials constitute the great majority of contexts for the scarab and seal designs of the Late Middle Kingdom, while royal burials included in the present analysis are found only in Dahshur,⁴⁶ Lahun,⁴⁷ Abydos,⁴⁸ though scarabs retrieved at these sites come also from non-royal burials.⁴⁹

Settlement contexts of the Late Middle Kingdom with scarab and seal designs are found in Lisht,⁵⁰ Lahun,⁵¹ and Elephantine.⁵² These sites have also

40 Engelbach and Gunn 1923, 18–20 and pls. X, XX, LVIII–LXII.

41 Brunton, Gardiner, and Petrie 1930, 1–3 and pls. II, IV.

42 Ayrton et al. 1904, 18, 47, 53 and pls. XI, XXXIX; Ben-Tor 2007, 29–31; Garstang, Newberry, and Milte 1901, 44–46 and pls. I, X, XV, and XXV; Martin 1971; Peet 1914, 58; Peet and Loat 1913, 23–28 and pls. IV, VIII; Tooley 2015; Wegner 1996; Wegner 1998, figs. 17–19.

43 Bietak, Mlinar, and Schwab 1991, 36; Forstner-Müller 2008, 135–36; Mlinar 2001b, ns. 1–22; Schiestl 2009, 91–92.

44 Downes 1974, 56–66 and Tomb register.

45 For an overview of the scarab and seal impressions of the Late Middle Kingdom: Ben-Tor 2007, 10–41.

46 Ben-Tor 2004, figs. 2 and 6; Ben-Tor 2007, 30 and 33–37; De Morgan et al. 1895, 62, 69 and 109–10; Keel 1989, 285 and fig. 4; Martin 1971, n. 1601 and pl. 14.11; Newberry 1907, pl. 18 and ns. 37411, 37413; Oppenheim 1995, 10–11; Oppenheim 1996, 26; Tufnell, Martin, and Ward 1984, pl. 52 n. 3065.

47 Ben-Tor 2007, 10–37; Tufnell, Martin, and Ward 1984, pl. 53; Winlock 1934, 55–56.

48 Wegner 1996.

49 Ayrton et al. 1904, 18, 47, 53 and pls. XI, XXXIX; Baba and Yazawa 2015; Ben-Tor 2007, 10–37; Tufnell, Martin, and Ward 1984, pl. 53.

50 Ben-Tor 2007, 13–40; Hayes 1953, 191 and fig. 226; Lansing 1924, 41; Martin 1971.

51 Ben-Tor 2007, 10–37; Martin 1971; Petrie, Brunton, and Murray 1923, 26–34, pls. XLVIII and LXIII–LXV; Petrie, Griffith, and Newberry 1890, 29, pl. X; Petrie et al. 1891, 14, pls. VI–II–X; Tufnell 1975, figs. 2–12; Tufnell, Martin, and Ward 1984, pl. 53; Winlock 1934, 55–56.

52 Ben-Tor 2007, 10–35; Tufnell 1975, fig. 3; Von Pilgrim 1996, figs. 98–104.

a great variety of types. Furthermore, a settlement context comes from the Theban area.⁵³ Other sites included in the present analysis are Denderah,⁵⁴ Riqqeh,⁵⁵ Matmar,⁵⁶ Mostagedda,⁵⁷ Hu,⁵⁸ Edfu,⁵⁹ Ballas,⁶⁰ and Nubt.⁶¹ This latter has also yielded a great variety of types, though the number of contexts where they were found is not known. However, it has been included in the analysis because the type and dating of the contexts is mentioned by the excavator.⁶²

As far as the types of scarab and seal designs during the Late Middle Kingdom are concerned, the most common designs include interlocking scrolls and spirals, or combinations of various hieroglyphs (Types 2A, 2B, 3A3). Other common designs include floral patterns, unlinked scrolls and spirals, and borders with paired scrolls (Types 1E, 6A2, 7B3). Designs that are slightly less common include the sign of union, the *nbtj* design, the cobras, the eyes of Horus, sedge plants, formulae, cartouches, circles, crosses, single line loops, convoluted coils of various shapes, continuous scrolls borders, rope borders, as well as animal and anthropomorphic representations (Types 3A1, 3A2, 3B1, 3B4, 3B5, 3C, 3D, 4, 5, 6A2, 6B1-2, 6B3, 7A1, 7A2, 8A, 9, 10). Other designs, which are also found but are not common, include the Horus hawk, the *nsw-bit*, red crowns, the gold sign, forepart of lions, panels with cross-bars in margins, single line threads, open borders with paired scrolls, and borders with twisted cable (Types 3A4, 3B2, 3B3a, 3B3b, 3B3c, 3B3e, 3B6, 3B7, 3E4, 6A1, 7B1, 7B4, 7C, 8C).

Regarding the scarabs themselves, during the Late Middle Kingdom they are made mostly of steatite and faience, but other materials are used as well. These materials include mostly amethyst and, on a lesser scale, carnelian, feldspar, lapis lazuli, turquoise, jasper, and obsidian. Sometimes gold and silver are used as well in the production of scarabs, to manufacture the rings where they were mounted.

- 53 Anthes 1943, 10; Loyrette, Nasr, and Bassiouni 1994, 116–18; Martin 1971; Millet 2007.
- 54 Petrie and Griffith 1900, 25–26 and pl. XX.
- 55 Engelbach et al. 1915, pl. XVII.
- 56 Brunton 1948, 54–56 and pl. XLIII.
- 57 Brunton and Morant 1937, 113–14 and pls. LXVIII–LXIX.
- 58 Ben-Tor 2007, 36–37; Bourriau 2009, 59, 61, 63, and 81; Petrie and Mace 1901, 43–44 and pl. XLI.
- 59 Michałowski et al. 1939, 31–33; Michałowski et al. 1950, 184 and pl. XLIV.13.
- 60 Martin 1971; Petrie, Quibell, and Spurrell 1896, 44 and pl. LVIII.
- 61 Ben-Tor 2007, 10–31 and 78–97; Martin 1971; Petrie, Quibell, and Spurrell 1896, 65–67 and pls. LXXX–LXXXI.
- 62 Petrie, Quibell, and Spurrell 1896, 65–67.

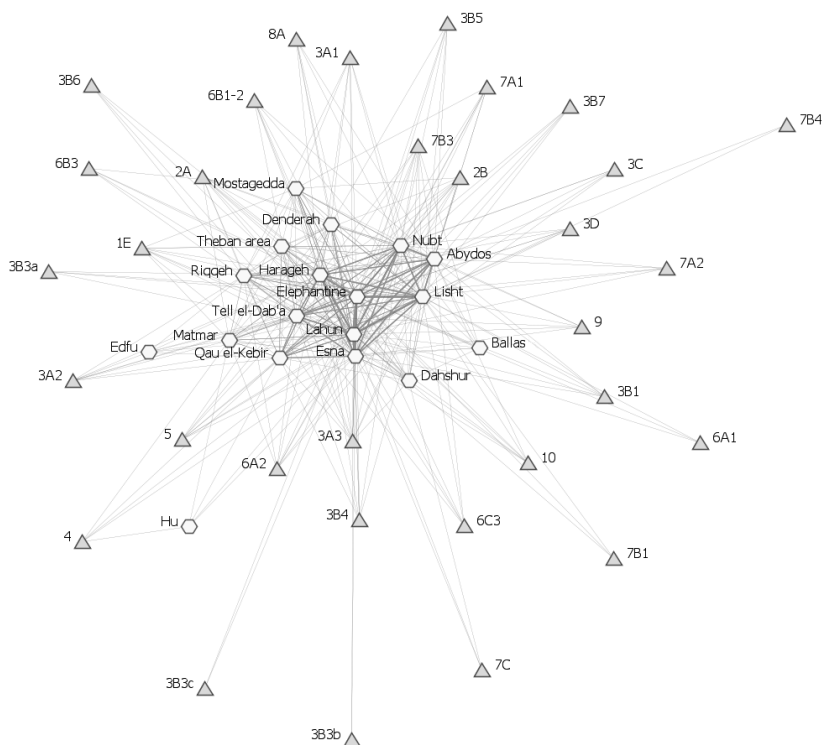


Figure 55: Contexts of the Late Middle Kingdom and the most common scarab and seal designs.

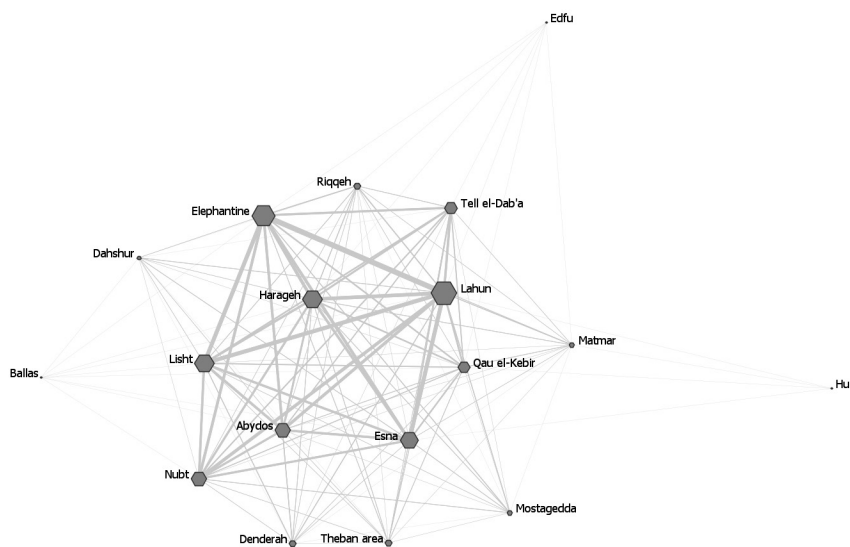


Figure 56: Degree centrality of the first one-mode graph of the scarab and seal designs during the LMK.

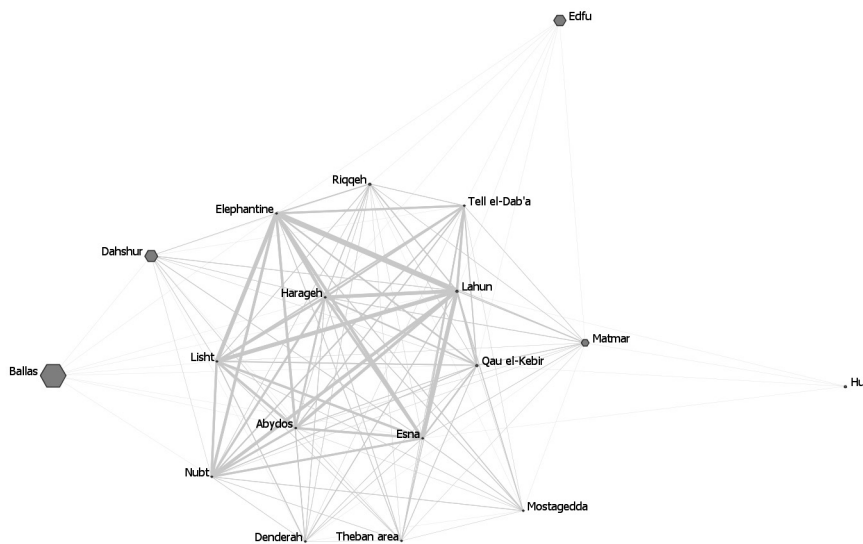


Figure 57: Betweenness centrality of the first one-mode graph of the scarab and seal designs during the LMK.

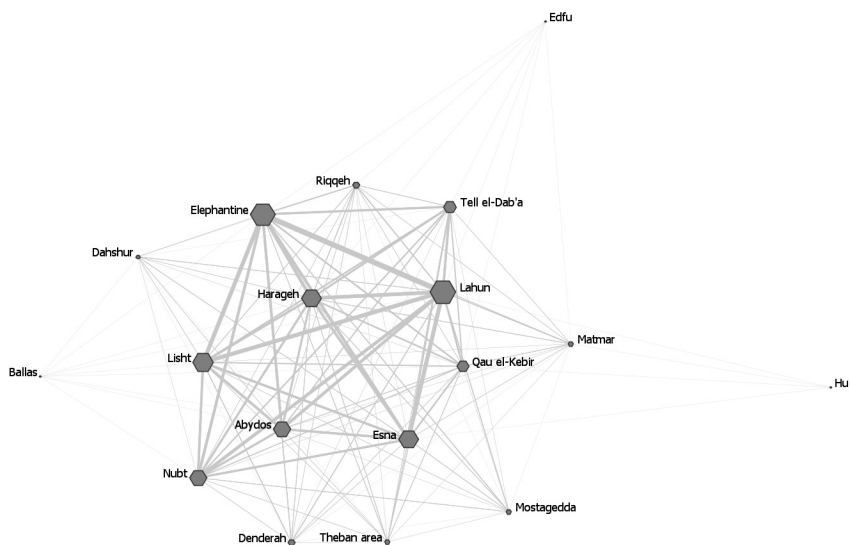


Figure 58: Eigenvector centrality of the first one-mode graph of the scarab and seal designs during the LMK.

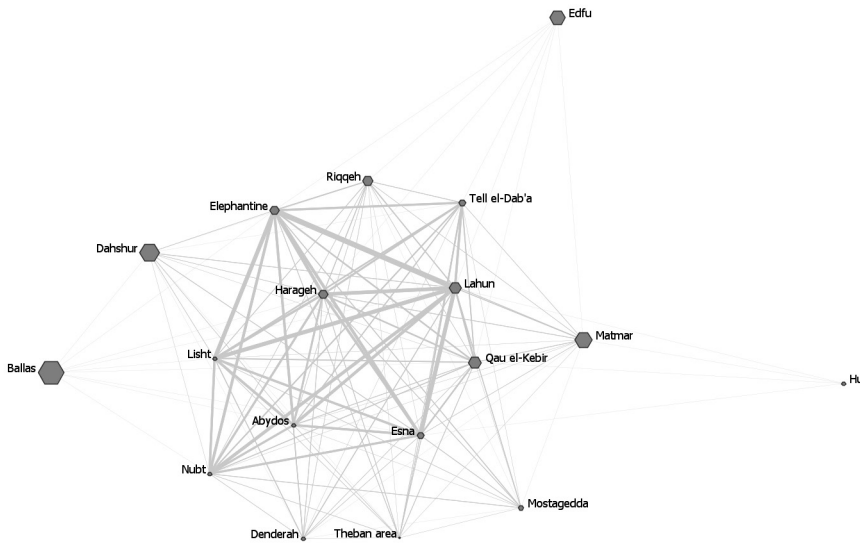


Figure 59: Closeness centrality of the first one-mode graph of the scarab and seal designs during the LMK.

The first one-mode graph

In the network created by the shared designs of scarab and seal designs (Figures 56–59) all the sites are connected, meaning that they all share at least one type of design. This implies that these sites are the ones that share the higher amount of designs with the other sites. Nevertheless, the stronger connections are between the sites in the Memphis-Fayyum area and southern Upper Egypt.

As far as the centrality measures are concerned (Tables 27, 40, 53, 66 in Appendix II), Lisht, Lahun, Harageh, Esna, Nubt, and Elephantine have a high or very high rank for both the degree and the eigenvector centrality, implying that they were the better-connected sites, with many strong connections of good quality. Tell el-Dab'a, Qau el-Kebir, and Abydos have a similar pattern, but score mostly in the middle rank, suggesting a less prominent role based on the data collected.

Ballas has high or very high betweenness and closeness centrality, while Dahshur and Edfu score mostly in the middle rank. This shows that they were intermediaries in the network of scarab and seal designs, with Ballas the most prominent site in this role. Riqqeh, Matmar, Mostagedda, Hu, Denderah, and the Theban area score in the lowest ranks, meaning that the area does not create strong connections in the network, based on the available data. Only

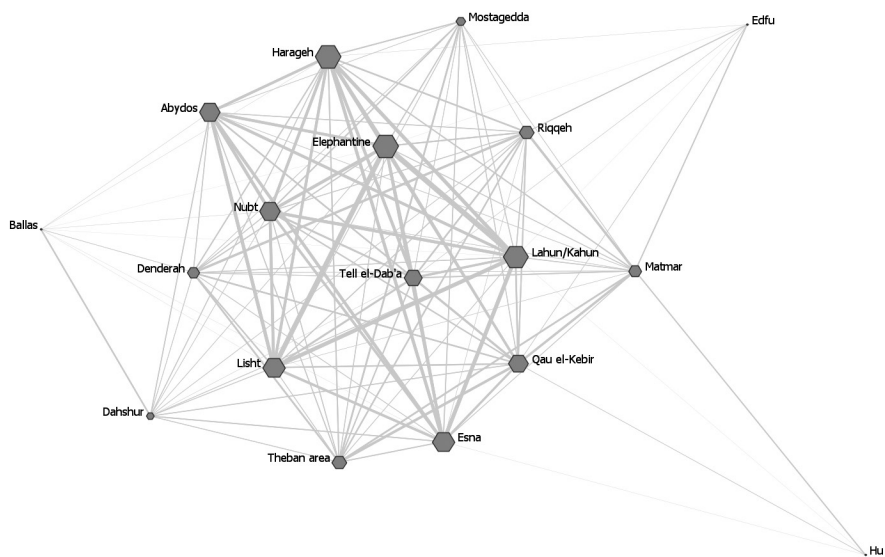


Figure 60: Degree centrality of the second one-mode graph of the scarab and seal designs during the LMK.

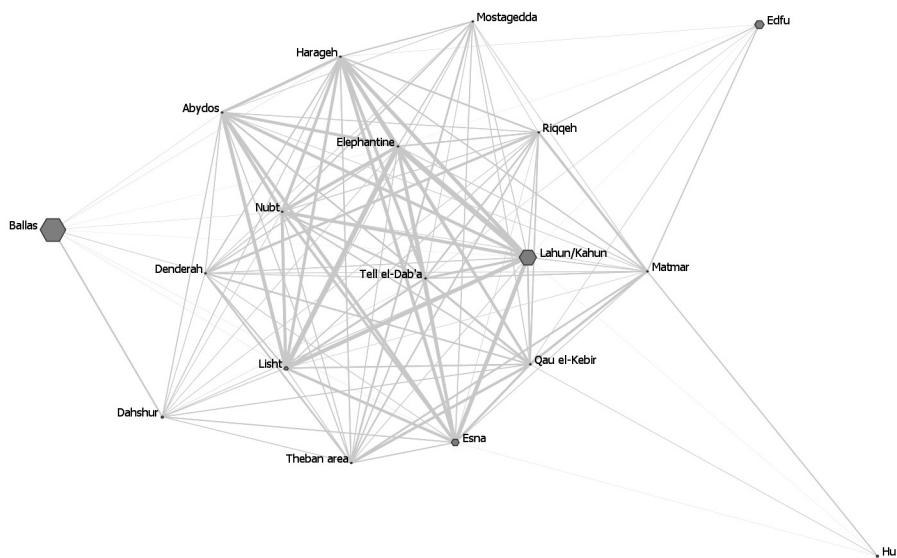


Figure 61: Betweenness centrality of the second one-mode graph of the scarab and seal designs during the LMK.

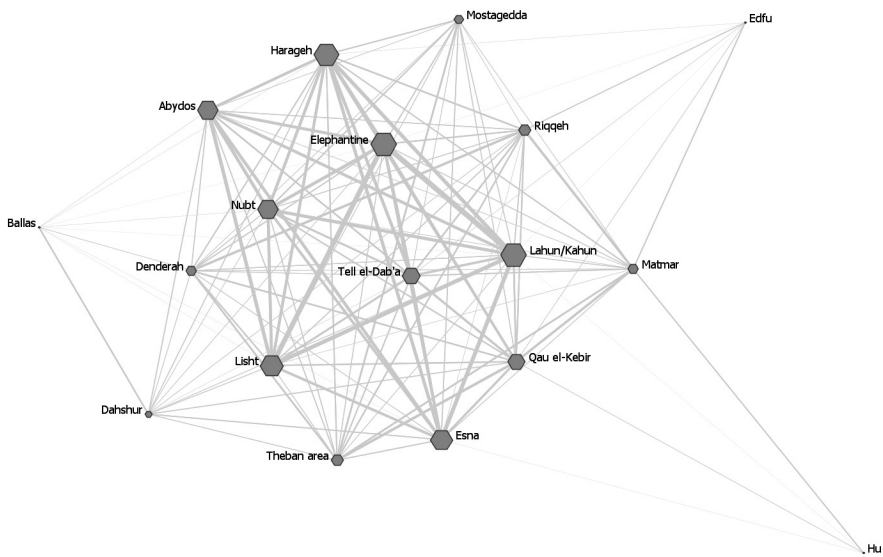


Figure 62: Eigenvector centrality of the second one-mode graph of the scarab and seal designs during the LMK.

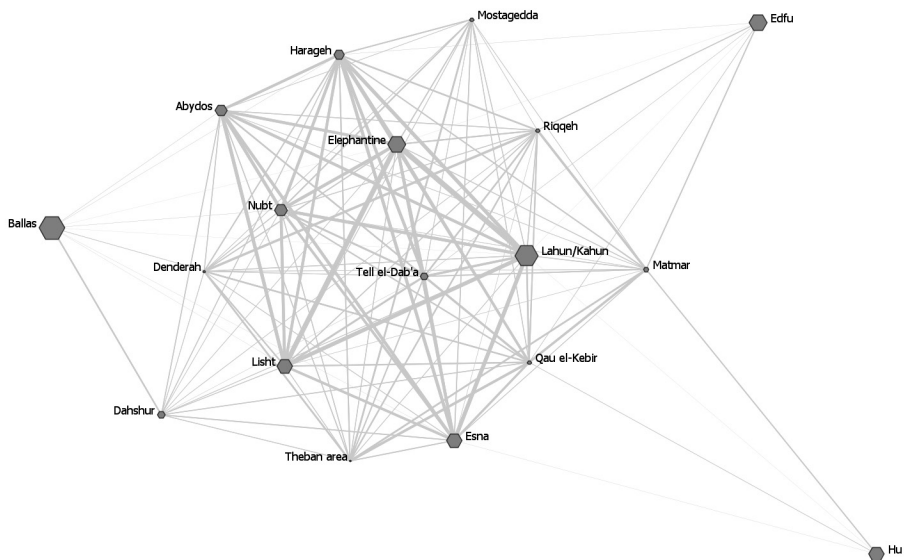


Figure 63: Closeness centrality of the second one-mode graph of the scarab and seal designs during the LMK.

Matmar has a high closeness centrality, meaning it was more easily accessible than the other sites in the network.

The one-mode graph based on the Jaccard similarity

The structure detected in the second one-mode graph (Figures 60–63), created through the Jaccard algorithm applied to the full range of designs, has the same shape as the one-mode graph, meaning that its structure is reliable. From the analysis of the centrality measures (Tables 79, 92, 105, 118 in Appendix III), it appears that Lisht, Lahun, Harageh, Esna, Nubt, and Elephantine have similar scores in both one-mode graphs. In other words, they score in the high or very high rank for both the degree centrality and the eigenvector centrality, thus they are still the better-connected sites.

It can be noticed that Lahun and Lisht scores in the higher ranks for all the measures, thus it looks more important in the second graph. In addition, the closeness centrality is generally in higher ranks than in the first graph, therefore the sites appear more easily reachable through the connections established in the network. The described small differences derive from the proportion of common and not common types that form the range of scarab and seal designs shared by the sites. Mostagedda and Hu keep a similar pattern in both networks too, scoring mostly in the lower ranks. However, Hu has a high closeness centrality, which means that, when the whole range of scarab and seal designs is considered, it is more easily reachable than Mostagedda.

At the same time, Ballas scores very high for the betweenness and closeness centrality in both graphs, meaning that it still appears like a main intermediary in the network of scarab and seal designs. Tell el-Dab'a, Qau el-Kebir, and Abydos are also among the better-connected sites in the second graph, scoring high degree and eigenvector centrality. Therefore, they keep a similar pattern in both graphs, but they appear more important when their full range of designs is considered. Riqqeh, Matmar, Denderah, and the Theban area also appear more important when their full range of scarab and seal designs is analysed, because in the second graph they score in the middle rank for the degree and eigenvector centrality. This situation derives from the fact that all these sites, although they have a large part of their range of scarab and seal designs in common, do not share many of the common types. Consequently, they appear less important when only the shared types are examined, while they acquire more importance when the full range of types are analysed.

Lastly, Dahshur and Edfu score mostly in the lower ranks, looking less important when the full range of scarab and seal designs are considered. The only exception is the closeness centrality of Edfu, which is in the high rank. However, the mostly low scores detected for Dahshur and Edfu originate from the fact that these sites do not have a large part of their range in common, but

this part includes mostly common types, so that they acquire more importance when only the shared types are examined, because these types shape the results of the first one-mode graph.

Summary

The major players in the network, created by the designs on scarabs and seals, during the Late Middle Kingdom are Lisht, Lahun, Harageh, Esna, Nubt, and Elephantine. This implies that these sites could be the starting or ending points of the flow of communications in the network and had the strength of spreading new trends because they created many connections through their material culture.⁶³ Ballas seems to be an intermediary, thus, to play the role of a passageway or (re)distribution centre in the network of scarab and seal designs, namely the place where the objects would pass by or be redistributed from.⁶⁴

At the same time, Tell el-Dab'a, Abydos and Qau el-Kebir appear among the better-connected sites of the network only when their full range of designs is considered, because they share several types of scarab and seal designs with the other sites, but not many of the most common ones. The contrary is true for Dahshur and Edfu, which seem more important only when the shared types are considered. This comes from the fact that these sites only share a small part of their scarab and seal designs, but this part is largely made of the most common types.

THE EARLY SECOND INTERMEDIATE PERIOD

For the Early Second Intermediate Period (Table 15 in Appendix I; Appendix VII) only few contexts with scarab and seal designs, from four sites, are included in the analysis.⁶⁵ Of these sites, only Ain Asil⁶⁶ is not found also in the analysis of the Late Middle Kingdom, while the others, namely Tell el-Dab'a,⁶⁷ Qau el-Kebir,⁶⁸ and Abydos⁶⁹ are included also in the analysis of the Late Middle Kingdom. More than half of these contexts comes from Tell el-Dab'a,⁷⁰

63 Östborn and Gerding 2015.

64 Gjesfeld 2015; Rivers, Knappett, and Evans 2013.

65 For an overview of scarab and seal impressions during the Second Intermediate Period: Ben-Tor 2007, 72–113.

66 Marchand, Soukiasian, and Bourriau 2010, 305–7.

67 Ben-Tor 2007, 89; Bietak, Mlinar, and Schwab 1991, 46–89; Forstner-Müller 2008, 143–90; Mlinar 2001b, ns. 201–307.

68 Brunton, Gardiner, and Petrie 1930, 3–13, pls. V–VIII and XIX.

69 Garstang, Newberry, and Milte 1901, 44–46 and pl. X; Martin 1971; Peet 1914, 57–58 and pl. XIII; Randall-MacIver, Mace, and Griffith 1902, 101 and pl. LIII.

70 Ben-Tor 2007, 89; Bietak, Mlinar, and Schwab 1991, 46–89; Forstner-Müller 2008,

and are all burials. The second site with the higher number of contexts with scarab and seal designs is Abydos.⁷¹ Both Tell el-Dab'a⁷² and Abydos⁷³ are the sites with the greatest variety of types. The two remaining sites are Qau el-Kebir⁷⁴ and Ain Asil,⁷⁵ where scarab and seal designs respectively come from burial and settlement contexts.

Concerning the types of scarab and seal designs during the Early Second Intermediate Period, these include floral patterns, linked and unlinked scrolls and patterns, the sign of union, the nbty sign, cobras, the *nsw-bit*, red crowns addorsed, formulae, circles, crosses, single line threads and loops, borders with paired scrolls, antelopes, and standing anthropomorphic figures (Types 1E, 2A, 2B, 3A1, 3A2, 3A3, 3B1, 3B3b, 3C, 4, 5, 6A1, 6A2, 7B1, 7B3, 9B, 10A). Of these designs, only the *nsw-bit* is not found in the types analysed for the Late Middle Kingdom.

The materials used to make the actual scarabs include, like in the Late Middle Kingdom, steatite and faience, as well as, very rarely, amethyst and rock crystal. Designs from scarabs and seals come from more tombs dated to the Second Intermediate Period in Abydos⁷⁶ and Qau el-Kebir.⁷⁷ and Esna.⁷⁸ Nevertheless, they could not be included in the analysis because their contexts have not been precisely dated to the Early or to the Late Second Intermediate Period. The types found among these designs are the same as seen in the dated tombs, with the exception of type 3E2, which is found only in one tomb in Esna.⁷⁹ Furthermore, scarabs of amethyst, carnelian, and jasper are found in Abydos.⁸⁰

Contacts in the Early Second Intermediate Period

Only Tell el-Dab'a and Abydos are connected in the network of this phase, because they share several design types in the analysis of the Early Second

143–90; Mlinar 2001b, ns. 201–307.

71 Garstang, Newberry, and Milte 1901, pl. X; Martin 1971; Peet 1914, 57–58 and pl. XIII; Randall-MacIver, Mace, and Griffith 1902, 101 and pl. LIII.

72 Ben-Tor 2007, 89; Bietak, Mlinar, and Schwab 1991, 46–89; Forstner-Müller 2008, 143–90; Mlinar 2001b, ns. 201–307.

73 Garstang, Newberry, and Milte 1901, 44–46 and pl. X; Martin 1971; Peet 1914, 57–58 and pl. XIII; Randall-MacIver, Mace, and Griffith 1902, 101 and pl. LIII.

74 Brunton, Gardiner, and Petrie 1930, 3–13, pls. V–VIII and XIX.

75 Marchand, Soukiasian, and Bourriau 2010, 305–7.

76 Garstang, Newberry, and Milte 1901, pl. X; Peet 1914, 57–64; Randall-MacIver, Mace, and Griffith 1902, 67 and 97–101.

77 Brunton, Gardiner, and Petrie 1930, 3–13, pls. V–VIII and XIX.

78 Downes 1974, 56–66 and tomb register.

79 Ben-Tor 2007, 86–87; Downes 1974, 62.

80 Peet 1914, 57–64.

Intermediate Period (Figure 65). On the contrary, Qau el-Kebir and Ain Asil do not have any type of design in common with the other sites. Nevertheless, considering the small size of the sample analysed, the possibility of further contacts, which cannot yet be detected, also between other sites cannot be excluded.

So far, it can only be said that the available data suggest contacts between Tell el-Dab'a and Abydos during the Early Second Intermediate Period, already shown by the analysis of other materials.

THE LATE SECOND INTERMEDIATE PERIOD

Of the sites with scarab and seal designs included in the analysis of this period (Table 9 in Appendix I; Appendix VIII),⁸¹ Tell el-Dab'a,⁸² Qau el-Kebir,⁸³ and Abydos⁸⁴ are included also in the analysis of all the periods studied in the present work. Other sites, namely Matmar,⁸⁵ Mostagedda,⁸⁶ Hu,⁸⁷ and the Theban area⁸⁸ are examined in the analysis not only of the Late Second Intermediate Period, but also of the Late Middle Kingdom. Moreover, Ain Asil⁸⁹ is in the analysis of both the Early and the Late Second Intermediate Period. Lastly, the sites of Tell el-Maskhuta,⁹⁰ Tell el-Retaba,⁹¹ Sedment,⁹² Deir el-Ballas,⁹³ and Tell Hebua⁹⁴ are found only in the analysis of the Late Second Intermediate Period.

81 For an overview of scarab and seal impressions during the Second Intermediate Period: Ben-Tor 2007, 72–113.

82 Ben-Tor 2007, 72–113; Bietak, Mlinar, and Schwab 1991, 134–247; Forstner-Müller 2008, 220–371; Hein, Jánosi, and Kopetzky 2004, 62–199, 339–52; Mlinar 2001b, ns. 401–914.

83 Ben-Tor 2007, 31–33 and 74–95; Brunton, Gardiner, and Petrie 1930, 3–13, pls. V–VIII and XIX; Keel 1989, 283 and fig. 5; Martin 1971.

84 Ayrton et al. 1904, 100 and pl. LIII; Garstang, Newberry, and Milte 1901, 44–46 and pl. X.

85 Brunton 1948, 56–58 and pls. XLIII–XLIV.

86 Ben-Tor 2007, 28–29 and 72–100; Brunton and Morant 1937, 114–22 and pl. LXIX.

87 Ben-Tor 2007, 72–93; Bourriau 2009, 76–77, 82, 85–86; Petrie and Mace 1901, 51–53 and pl. XLI.

88 Ben-Tor 2007, 111; Martin 1971; Miniaci 2011; Miniaci and Quirke 2009, 356; Petrie and Walker 1909, 9 and pl. 29; Tufnell, Martin, and Ward 1984, pl. 63; Winlock 1924.

89 Marchand, Soukiassian, and Bourriau 2010, 305–7.

90 Ben-Tor 2007, 74–102; Holladay Jr. 1982, 45; Holladay Jr. 1997, fig. 7.9; Redmount 1989, 903–55.

91 Rzepka et al. 2014, 39–46.

92 Petrie and Brunton 1924, 16–20, pls. XLIII and XLVI–XLVII.

93 Bourriau 1990, 24.

94 Maksoud 1998, 255–60.

The sites with the highest number of contexts with scarab and seal design during the Late Second Intermediate Period are Tell el-Dab'a,⁹⁵ like in the Early Second Intermediate Period, and Mostagedda,⁹⁶ followed by Sedment,⁹⁷ and Qau el-Kebir.⁹⁸ These contexts come from tombs, with only Tell el-Dab'a⁹⁹ contributing contexts from settlement among these sites. All the mentioned sites, as well as Tell el-Yahudiyah,¹⁰⁰ Tell el-Maskhuta,¹⁰¹ and Rifeh,¹⁰² are also the ones where a greater variety of types is found. Settlement contexts with scarab and seal designs have been excavated not only in Tell el-Dab'a,¹⁰³ but also in Rifeh,¹⁰⁴ Deir el-Ballas,¹⁰⁵ and Ain Asil.¹⁰⁶ Moreover, Tell Hebua,¹⁰⁷ Tell el-Maskhuta,¹⁰⁸ Tell el-Yahudiyah¹⁰⁹ have contributed both burial and settlement contexts. However, burials form the majority of contexts with scarab and seal designs.

Regarding the types of scarab and seal designs found in the Late Second Intermediate Period, visible in Figure 66, the most common ones include scrolls and spirals, various hieroglyphs combined, sedge plants, formulae, circles, and borders with paired scrolls (Types 2B, 3A3, 3B5, 3C, 4, 7B). Common, but on a lesser scale, designs are the floral designs with papyrus, the Horus hawk, cobras, red crowns, the gold sign, crosses, single line loops, con-

- 95 Ben-Tor 2007, 72–113; Bietak, Mlinar, and Schwab 1991, 134–247; Forstner-Müller 2008, 220–371; Hein, Jánosi, and Kopetzky 2004, 62–199 and 339–52; Mlinar 2001b, ns. 401–914.
- 96 Ben-Tor 2007, 28–29 and 72–100; Brunton and Morant 1937, 114–22 and pl. LXIX.
- 97 Petrie and Brunton 1924, 16–20, pls. XLIII and XLVI–XLVII.
- 98 Ben-Tor 2007, 31–33 and 74–95; Brunton, Gardiner, and Petrie 1930, 3–13, pls. V–VIII and XIX; Keel 1989, 283; Martin 1971.
- 99 Ben-Tor 2007, 72–113; Bietak, Mlinar, and Schwab 1991, 134–247; Mlinar 2001b, ns. 401–914.
- 100 Adam 1958, 305–6; Ben-Tor 2007, 72–106; Griffith 1890, 38–40 and pl. X; Martin 1971; Petrie and Duncan 1906, 10–15 and pls. VI–IX; Tufnell 1978, fig. 2; Tufnell, Martin, and Ward 1984, pl. 56.
- 101 Ben-Tor 2007, 74–102; Holladay Jr. 1982, 45; Holladay Jr. 1997, fig. 7.9; Redmount 1989, 903–55.
- 102 Petrie, Thompson, and Crum 1907, 20–21 and pl. XXIII.
- 103 Ben-Tor 2007, 72–113; Bietak, Mlinar, and Schwab 1991, 134–247; Forstner-Müller 2008, 220–371; Hein, Jánosi, and Kopetzky 2004, 62–199 and 339–52; Mlinar 2001b, ns. 401–914.
- 104 Petrie, Thompson, and Crum 1907, 20–21 and pl. XXIII.
- 105 Bourriau 1990, 24.
- 106 Marchand, Soukiassian, and Bourriau 2010, 305–7.
- 107 Maksoud 1998, 255–60.
- 108 Ben-Tor 2007, 74–102; Holladay Jr. 1982, 45; Holladay Jr. 1997, fig. 7.9; Redmount 1989, 903–55.
- 109 Adam 1958, 305–6; Ben-Tor 2007, 72–106; Griffith 1890, 38–40 and pl. X; Martin 1971; Petrie and Duncan 1906, 10–15 and pls. VI–IX; Tufnell 1978, fig. 2; Tufnell, Martin, and Ward 1984, pl. 56.

voluted coils of various shapes, open borders with paired scrolls, borders with twisted rope, heraldic beasts, standing anthropomorphic figures, the Hathor symbol (Types 1E, 3A4, 3B1, 3B3b, 3B3c, 3B3E, 3B6, 5, 6A2, 6B1-2, 7B, 8A, 9C, 9F, 10A, 10D2). Less common designs include floral designs with lotus flower, the sign of union, the Horus eyes, cartouches, coils with central coil or twist, continuous scrolls borders, rope borders, crocodiles, antelopes (Types 3A1, 3B4, 3D1, 3E4, 6C2, 6C3, 7A, 9B). The least common designs are the unlinked scrolls and spirals, *nsw-bit*, hieroglyphs divided into panels, borders with twisted cables, lions, various anthropomorphic figures, the standing Hathor-like figure (Types 2A, 3B2, 3E1, 8C, 9E, 10B, 10D1).

Of these designs, floral patterns, linked and unlinked scrolls and spirals, the sign of union, various hieroglyphs combined, cobras, the *nsw-bit*, red crowns, formulae, crosses, borders with paired scrolls, and animal and anthropomorphic figures (Types 2A, 2B, 3A1, 3A3, 3B1, 3B2, 3B3, 3C, 5, 7B, 9, 10), are found in all the periods examined. The Horus hawk, the Horus eyes, sedge plants, the gold sign, cartouches, circles, single line loops, convoluted coils, continuous scrolls borders, open borders with paired scrolls, and rope borders are included in the analysis not only of the Late Second Intermediate Period, but also of the Late Middle Kingdom (Types 3A4, 3B4, 3B5, 3B6, 3D, 4, 6A, 6B, 6C, 7A, 7C, 8A, 8C).

Concerning the materials used to produce the scarabs, they are mostly faience and steatite, like in the previous two periods examined. Scarabs and seals of the Late Second Intermediate Period are also made of amethyst, which is found in both previous periods, as well as, more rarely, carnelian and jasper, which are found also in the Late Middle Kingdom.

The first one-mode graph

The first one-mode graph (Figures 67–70), detected through the designs of scarab and seal designs shared, shows that all the sites are connected, meaning that they share at least one type of design. Contacts are mostly between the sites in the Delta, namely Tell el-Dab'a, Tell el-Maskhuta, and Tell el-Yahudiyah, and the sites in Middle Egypt, especially Rifeh, Mostagedda, and Qau el-Kebir. At the same time, the connections between the sites in Lower Egypt and the sites in both Middle and southern Upper Egypt appear to pass through Sedment, mostly, and Ain Asil.

The analysis of the centrality measures (Tables 34, 47, 60, 73 in Appendix II) reveals that Tell el-Dab'a, Tell el-Yahudiyah, and Sedment are among the major players in the network. They score in the high or very high ranks for the degree and the eigenvector centrality, meaning that they have the higher amount of and the better connections: they are the better-connected sites. Also Tell el-Maskhuta, Rifeh, Mostagedda, and Qau el-Kebir show a similar

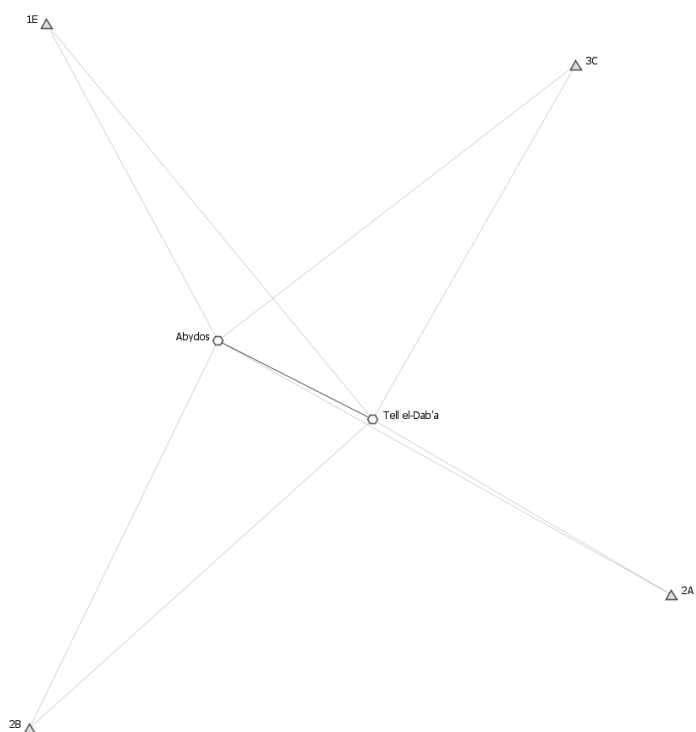


Figure 64: Contexts of the Early Second Intermediate Period and the most common scarab and seal designs.



Figure 65: First one-mode graph of the scarab and seal designs during the ESIP.

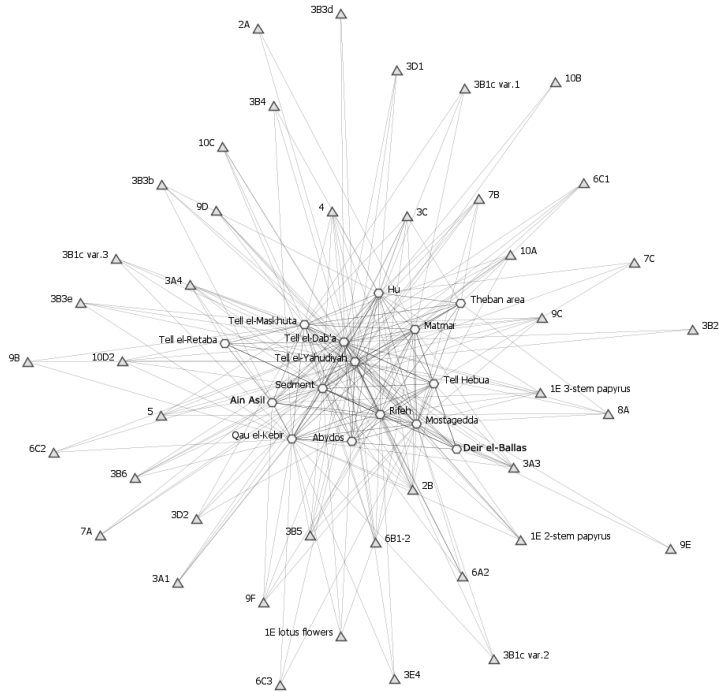


Figure 66: Contexts of the Late Second Intermediate Period and the most common scarab and seal designs.

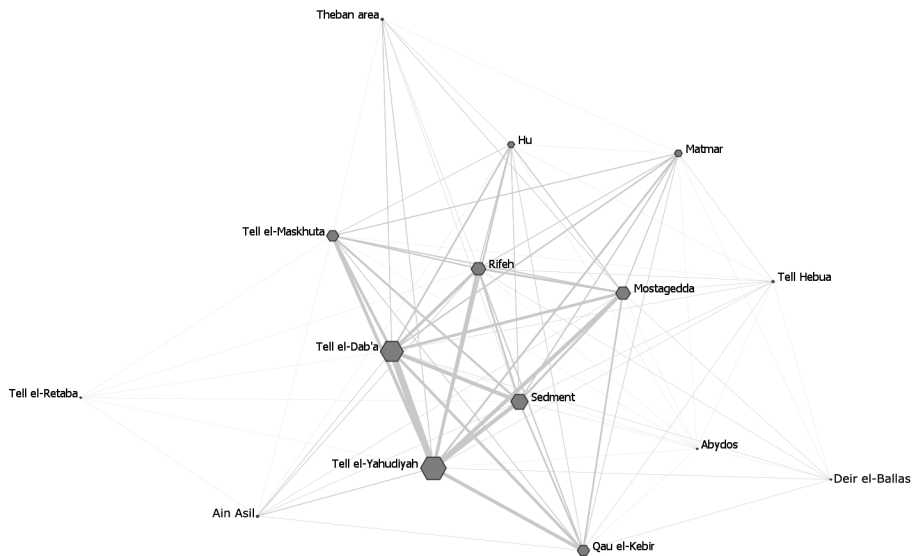


Figure 67: Degree centrality of the first one-mode graph of the scarab and seal designs during the LSIP.

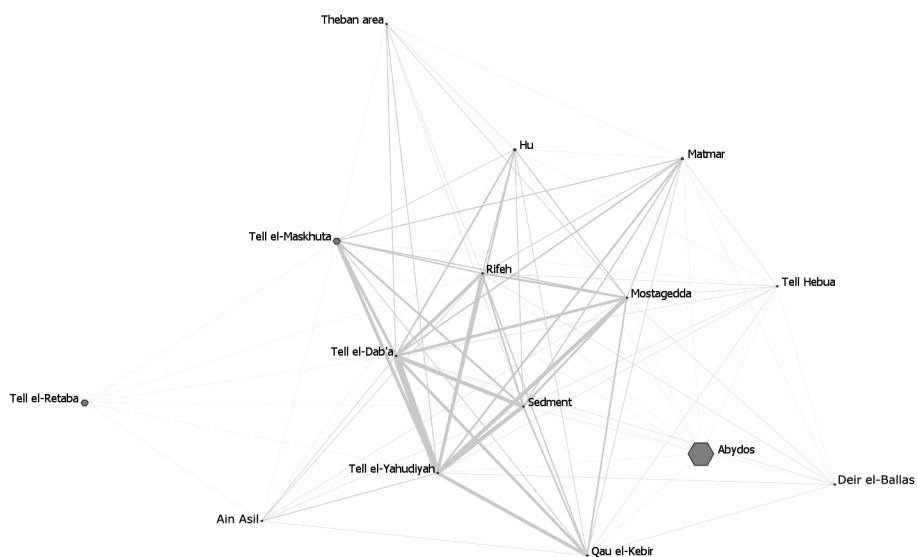


Figure 68: Betweenness centrality of the first one-mode graph of the scarab and seal designs during the LSIP.

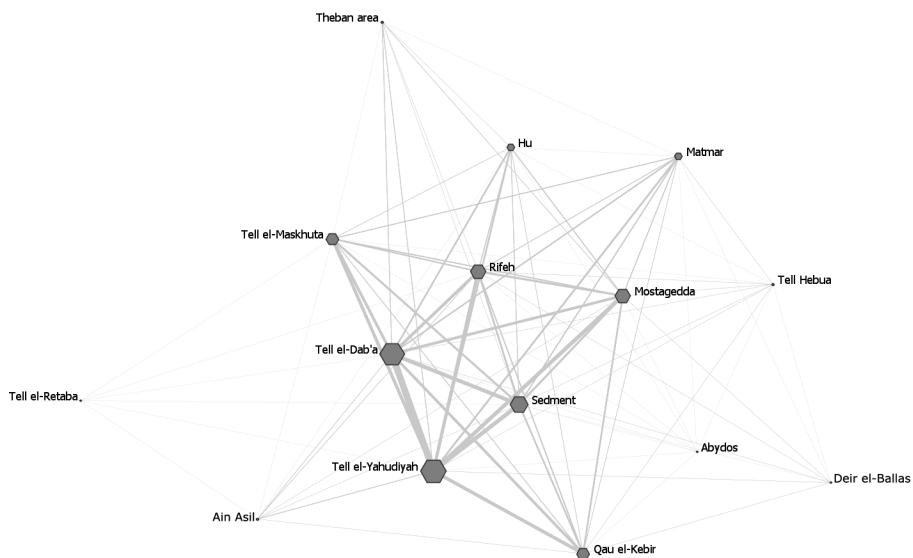


Figure 69: Eigenvector centrality of the first one-mode graph of the scarab and seal designs during the LSIP.

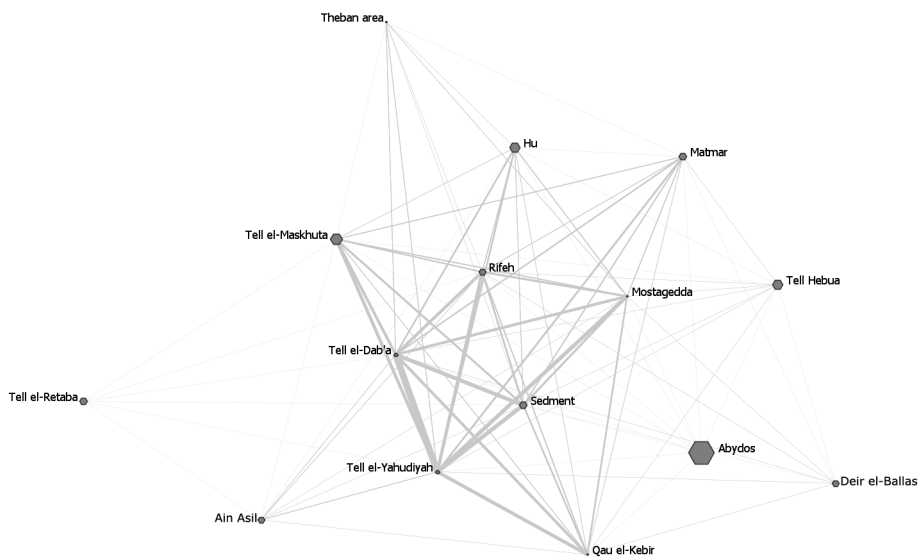


Figure 70: Closeness centrality of the first one-mode graph of the scarab and seal designs during the LSIP.

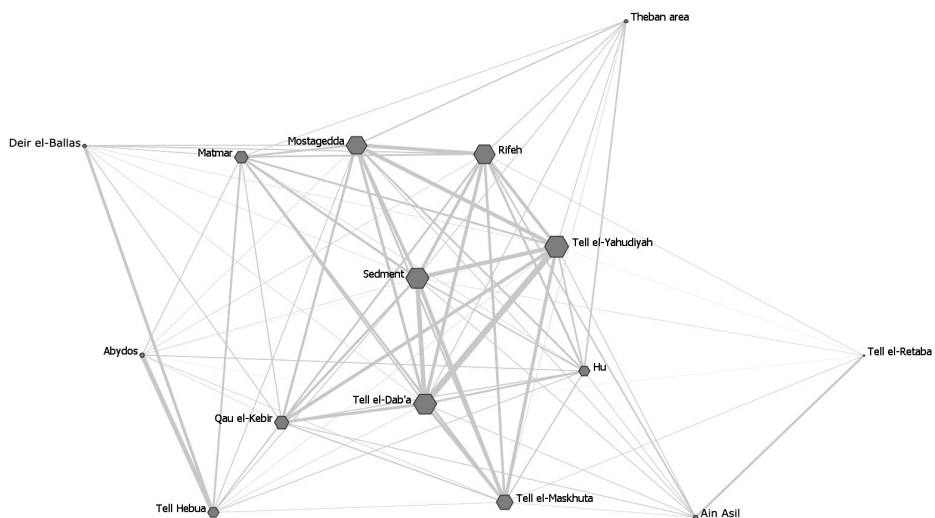


Figure 71: Degree centrality of the second one-mode graph of the scarab and seal designs during the LSIP.

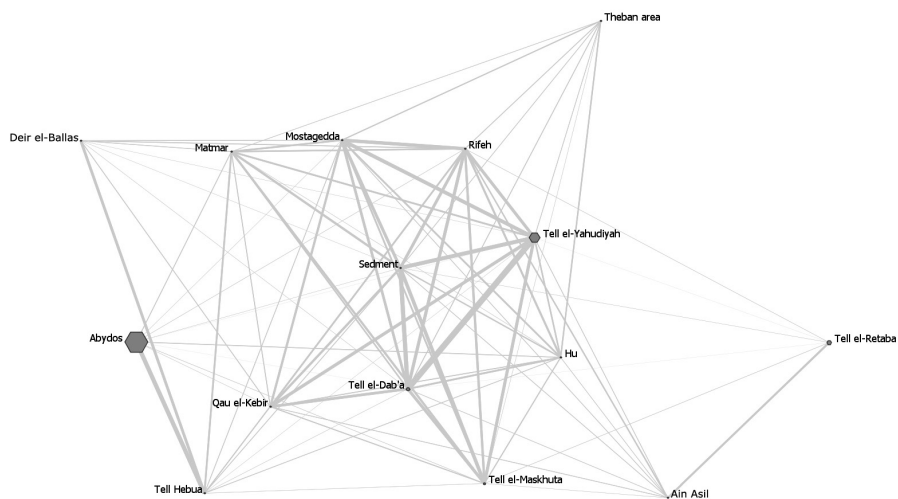


Figure 72: Betweenness centrality of the second one-mode graph of the scarab and seal designs during the LSIP.

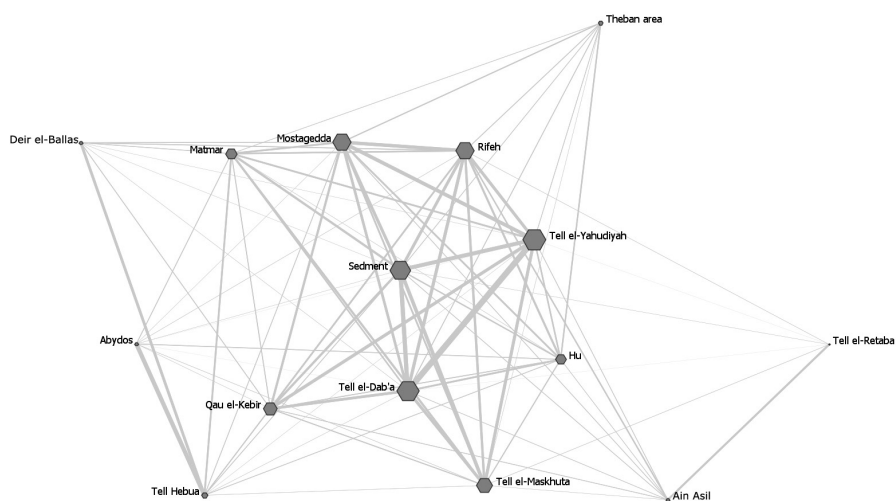


Figure 73: Eigenvector centrality of the second one-mode graph of the scarab and seal designs during the LSIP.

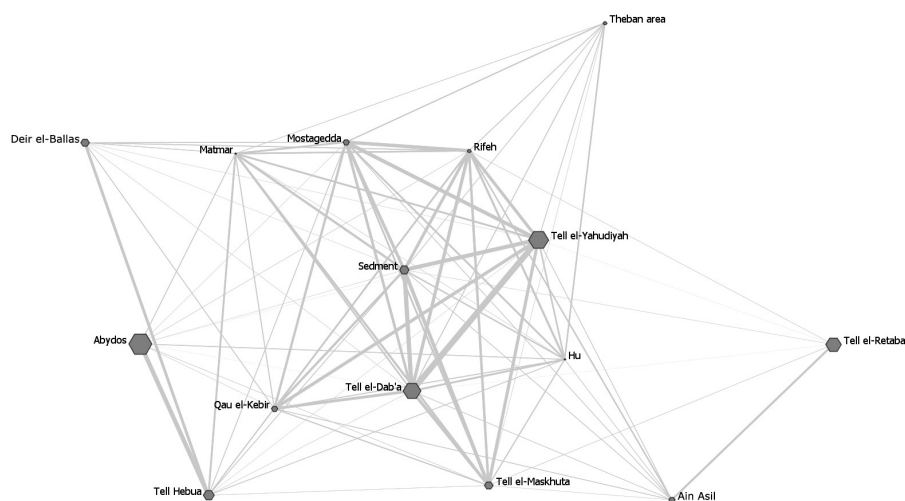


Figure 74: Closeness centrality of the second one-mode graph of the scarab and seal designs during the LSIP.

pattern, but they score in the middle range, which suggests that they were well connected, but not among the major players in the network. At the same time, Abydos has a very high betweenness and closeness centrality, suggesting its role as intermediary in the network of scarab and seal designs.

Lastly, Tell el-Retaba, Matmar, Hu, the Theban area, Deir el-Ballas, Tell Hebua, and Ain Asil score in the low or very low rank for all the measures, indicating that they create no strong connections in the network, on the basis of the data collected.

The one-mode graph based on the Jaccard similarity

The structure of the network based on the Jaccard similarity (Figures 71–74) is the same as the one detected in the first one-mode graph. Hence, the structure of the network is not altered, whether only the shared types or the full range of types is considered. The centrality measures (Tables 86, 99, 112, 125 in Appendix III) are exactly the same, or form a similar pattern, in both one-mode graphs for Tell el-Dab'a, Tell el-Yahudiyah, Sedment, Qau el-Kebir, Abydos, the Theban area, Deir el-Ballas, Tell Hebua, and Ain Asil.

Therefore, Tell el-Dab'a, Tell el-Yahudiyah, and Sedment still appear to be the better-connected sites in the network, while Qau el-Kebir is a well-connected site, but not a main player. Moreover, Abydos still looks like an important intermediary in the network, while the Theban area, Deir el-Ballas, Tell Hebua, and Ain Asil seem to share no particular connection in the network, on the basis of the data analysed. At the same time, Tell el-Maskhuta, Rifeh,

and Mostagedda are also among the better-connected sites, scoring in the high or very high ranks for the degree and the eigenvector centrality. Hence, they appear more important when their full range of scarab and seal designs is examined. Also Tell el-Retaba, Matmar, and Hu look more important when their full range of scarab and seal designs is considered. Tell el-Retaba scores very high for the betweenness and the closeness centrality, while Matmar and Hu score in the middle range of the degree and the eigenvector centrality. Thus, Tell el-Retaba looks like an important intermediary, while Matmar and Hu look like well-connected sites, though not among the main players.

Summary

During the Late Second Intermediate Period, the main players in the network created by the scarab and seal designs are Tell el-Dab'a, Tell el-Yahudiyah, and Sedment. Therefore, these sites were the better-connected and could be where the flow of communications in the network could start or end, and where new trends could be created.¹¹⁰ Also Tell el-Maskhuta, Rifeh, and Mostagedda are in this group, but only when their full range of designs is studied. This implies that part of their scarab and seal designs is shared with the other sites, but it does not include many of the most common types.

At the same time, Abydos and Tell el-Retaba, but this latter only when the full range of designs is considered, seem to be important intermediaries, namely passageways or (re)distribution centres,¹¹¹ in the circulation of scarab and seal designs, thus where the objects would be channelled through or (re)distributed from. The pattern of Tell el-Retaba derives from the fact that its scarab and seal designs are shared with other sites, though it does not include many of the most common types.

THE CORRESPONDENCE ANALYSIS

The results of the analysis of the scarab and seal designs have been examined also through correspondence analysis, to understand if the variety of types recovered at the sites affects the measures calculated in both graphs in this chapter. The results (Appendix IV) for the Late Middle Kingdom confirm the tendency of sites with higher variety of types to score higher for the degree centrality and the eigenvector centrality, while the betweenness centrality is not affected. The tendency increases in the analysis of the Late Second Intermediate Period, probably because the data are fewer. Nevertheless, this tendency decreases for both periods when the scores of the second one-mode

110 Östborn and Gerding 2015.

111 Gjesfeld 2015; Rivers, Knappett, and Evans 2013.

graph are considered. This shows that a larger number of types could mean higher scores, but not necessarily so, and that the results are reliable and not inescapably affected by archaeological bias.

CONCLUDING REMARKS

For the Late Middle Kingdom, the sites of Lisht, Lahun, Harageh, Esna, Nubt, Elephantine, and probably Tell el-Dab'a, Abydos, and Qau el-Kebir, have been detected as the possible sites where the designs found on scarabs and seals, hence the objects themselves, were made and sent from, or sent to. The circulation of these designs seems to rely mostly on sites in the Memphis-Fayyum area and southern Upper Egypt, with a few probably important sites in Middle Egypt. Considering that Lisht, Lahun, and Harageh were in the area of the capital of the time,¹¹² and that Elephantine was an important position to enter Nubia, the results are not surprising.

The importance of the sites in the Memphis-Fayyum area during the Late Middle Kingdom, and of Abydos and Esna, is also shown by the presence of scarabs and seals made of imported materials, such as lapis lazuli and obsidian. It is probably significant that lapis lazuli, which comes from modern-day Afghanistan,¹¹³ is found only in the royal tombs in the Memphis-Fayyum area and at Tell el-Dab'a. Obsidian is found in the Aegean, in the Levant, on the Arabian peninsula and in the horn of Africa.¹¹⁴ The fact that the obsidian objects analysed in the present work have been retrieved from southern Upper Egypt, mostly, and in the Memphis-Fayyum area, suggest that obsidian entered Egypt from the south, thus from the horn of Africa, and was transported to the Memphis-Fayyum through the sites in Upper and Middle Egypt. At the same time, Deir el-Ballas looks like a passageway or a (re)distribution centre in the same network. This implies that the designs on scarabs and seals, thus the objects themselves, could be channelled through there on their way to other sites, or that they were (re)distributed from there.

As far as the materials used to produce scarabs and seals are concerned, amethyst, siltstone, carnelian, and limestone are found near their source. Especially the sources of carnelian and limestone are widely found in Egypt, thus scarabs and seals of these materials are not very informative as far as contacts are concerned. At the same time, jasper and feldspar scarabs and seals are found near their source and in the area of the capital. All this indicates that these materials were not travelling long distances during the Late Middle Kingdom unless it was to reach the area of the capital.

112 Agut and Moreno-García 2016, 249–53; Grajetzki 2004; Quirke 2005.

113 B.G. Aston 1994, 72–73; Aston, Harrell, and Shaw 2000, 39–40; Lucas 1948, 455–56.

114 B.G. Aston 1994, 23–26; Aston, Harrell, and Shaw 2000, 46–47; Lucas 1948, 473–74.

During the Early Second Intermediate Period, Tell el-Dab'a and Abydos are the only two sites connected through the scarab and seal designs, while Ain Asil and Qau el-Kebir appear isolated in this network. This could imply a more localized production of scarab and seal designs, thus of the same scarabs and seals. Nevertheless, the fact that scarabs of amethyst and rock crystal are found in Tell el-Dab'a demonstrates that there were contacts with the areas where these materials could be found, namely in Middle and southern Upper Egypt, the Western Desert, and the Sinai.

During the Late Second Intermediate Period, the main players in the network created by the designs of scarab and seal designs are Tell el-Dab'a, Tell el-Yahudiyah, and Sedment. Therefore, these were the sites where the designs used on scarab and seal designs, hence the objects themselves, could be produced and sent from, or sent to. Also Tell el-Maskhuta, Rifeh, and Mostagedda are in this group, but only when their full range of designs is studied. At the same time, Abydos and Tell el-Retaba, but this latter only when the full range of designs is considered, seem to be important passageways or (re)distribution centres. Therefore, these were the places where the designs, and the same objects, would pass by on their way to their destination, or the places from where they were (re)distributed.

The structure of the network shows that during the Late Second Intermediate Period, contacts were mostly between the sites in the Delta and the ones in Middle Egypt, while contacts between Lower and southern Upper Egypt passed, mostly, by Sedment and Abydos, and less, by Ain Asil. It is possible that this was also the route through which materials used to produce scarabs, namely amethyst, jasper, feldspar, and serpentine, were reaching Lower Egypt from the southern part of the country. Limestone, which is also used for scarabs during this period, is not very informative, because it is widely found in Egypt.

TELL EL-YAHUDIYAH WARE

The present chapter analyses the types of Tell el-Yahudiyah ware, a class of pottery found already during the Middle Kingdom, and most typical of the Second Intermediate Period; the last attestations are found during the New Kingdom.¹ This ware includes mostly juglets, namely small jugs, which were used to probably contain liquids, likely precious ones. This is suggested by the fact that many specimens come from tombs, thus that this ware was considered prestigious enough to be part of the funerary equipment, and the fact that these juglets have a narrow neck, which would prevent that the liquid they contained would be spilled or evaporate.² Chemical analyses of the contents of Tell el-Yahudiyah jugs from Tell el-Dab'a has demonstrated that they contained fatty substances, thus likely oils.³ The fact that many specimens have been found in tombs further suggests that these vessels were used for religious purposes.⁴

The shape of the ovoid-shaped vessels can remind one of the poppy seeds, and in a few instances the incised decoration can remind one of the incisions made on the poppy seeds when they are collected. Therefore, it has been suggested that Tell el-Yahudiyah ware could also contain opium,⁵ as suggested in a similar way for the Cypriot pottery.⁶ Nevertheless, chemical analyses of the contents have failed to find the alkaloids expected if the vessels actually contained opium.⁷

Tell el-Yahudiyah ware is characterized by a surface which is burnished, namely rubbed and smoothed with a stone before the firing process, and with white incised decoration.⁸ Vessels without incised decoration, included in the

1 D.A. Aston 2008; Aston and Bietak 2012, 551–56; Bietak 1989a; Kaplan 1980.

2 Åström 1971; Kaplan 1980, 123; Merrillees 1974b, 32–40.

3 Aston and Bietak 2012, 557–58.

4 Aston and Bietak 2012, 557–58.

5 Åström 1971, 418; Kaplan 1980, 123; Merrillees 1974b, 32–40.

6 Merrillees 1974b, 32–40.

7 Aston and Bietak 2012, 621–23.

8 Aston and Bietak 2012, 25; Kaplan 1980, 1–5.

Tell el-Yahudiyah ware in older publications,⁹ are not considered a part of this group anymore, and have not been included in the newest publications. Therefore, they are not taken into consideration in the present work.¹⁰

This ware has been the subject of many studies concerning its origins, development, and chronology.¹¹ These studies follow slightly different typologies¹² on the basis of the main features, such as general shape of the vessels, their dimensions, the shape of different parts of the vessels, or the decoration, taken into consideration.¹³ The typology used in the present work follows the one in the latest publication on Tell el-Yahudiyah ware.¹⁴ In the description of the types, the following parts of the vessels are taken into consideration:

1. the rim, which includes:
 - a. the mouth, namely the top opening of a vessel;
 - b. the rim, namely the part connecting the mouth and the neck;
 - c. the lip, namely the outer part of the rim;
 - d. the neck, namely the part connecting the rim to the shoulder.
2. the body, which includes:
 - a. the shoulder, namely the part connecting the neck to the body;
 - b. the body, namely the central, main part of the vessel, described like a geometric figure;
3. the handle, namely the attachment that connects the neck to the shoulder and allows the vessel to be grabbed and moved.
4. the base, namely the part underneath the body and in contact with the support surface.

Tell el-Yahudiyah ware is found throughout the Eastern Mediterranean, from Egypt, and Nubia, to Cyprus, to coastal Syria Palestine, as inland as the Jordan Valley.¹⁵ Based on stylistic similarities, it was at first thought that this ware

9 Åström 1971.

10 Aston and Bietak 2012.

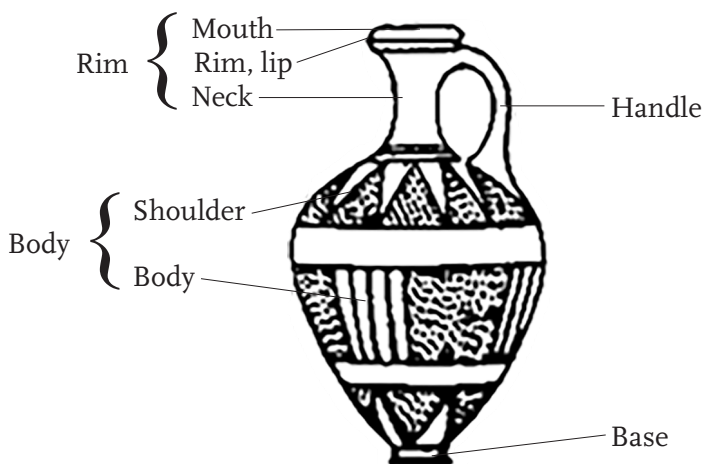
11 An overview can be found in: D.A. Aston 2008; Aston and Bietak 2012, 25–55.

12 In studies the earliest phase of the Tell el-Yahudiyah ware has even been called differently, namely El-Lisht ware: Merrillees 1974a; Merrillees 1974b; Williams 1975.

13 See for example: D.A. Aston 2008; Aston and Bietak 2012; Åström 1971; Kaplan 1980; Merrillees 1974a; Merrillees 1974b; Merrillees 1978b.

14 Namely, the typology used in: Aston and Bietak 2012.

15 See catalogues in: Aston and Bietak 2012; Kaplan 1980.



Drawing 4: Parts of a vessel as used in the description of the Tell el-Yahudiyah ware.
Drawing after Aston and Bietak 2012.

originated in Egypt,¹⁶ or in Nubia.¹⁷ Nevertheless, the dating of the contexts where Tell el-Yahudiyah ware has been unearthed, as well as the typology constructed on the basis of the new data, shows that it originated in coastal Palestine during the Egyptian Late Middle Kingdom. From there, during the transition between the Egyptian Late Middle Kingdom and Second Intermediate Period, it spread to inner Syria-Palestine, Cyprus, and Egypt, where it was first imported and then locally imitated. During the Egyptian Second Intermediate Period, the ware further developed locally, and in Egypt it developed into an Egyptian branch, with distinct Egyptian features.¹⁸

Part of the vessels and sherds belonging to the Tell el-Yahudiyah pottery do not have known contexts of provenance, but the majority comes from excavated contexts. Considering that in Egypt it was mostly produced in Lower and Middle Egypt, with instances also in the Bahariya Oasis,¹⁹ this ware allows to detect more specific contacts. However, similar types used at more sites still do not imply direct contacts between two specific places, but only that generally there were contacts, which could have followed a more indirect route that simply cannot be known yet.²⁰ This derives from the fact that the data analysed are not the totality of what has actually been produced, but only a

16 Aston and Bietak 2012, 25–55; Kaplan 1980, 60–66; Reisner 1923, 385–88.

17 Aston and Bietak 2012, 25–55; Junker 1921; Kaplan 1980, 121–23.

18 This development is explained in: D.A. Aston 2008; Aston and Bietak 2012, 551–56; Bietak 1989a.

19 The specimen from Qaret el-Toub in Bahariya could not be included in a specific subgroup, but only in the larger L.1 group, therefore is not included in the analysis: Aston and Bietak 2012, 54; Colin 2005, 44–46; Colin, Laisney, and Marchand 2000, 186.

20 Brughmans 2013, 638–39; Sindbæk 2007b, 66; Sindbæk 2013, 74–76, 82.

sample, namely what has been so far found and published.²¹ Especially in the case of Tell el-Yahudiyah ware, it should be kept in mind that the data from outside Tell el-Dab'a is limited. However, as it will become clear with the correspondence analysis, this does not seem to distort the results of the analysis.

All in all, only specimens belonging to one of the specific types listed in the present chapter have been examined, because these types can be meaningful and show similarity between the sites. Moreover, the fabric used to produce is not always clear, thus in the analysis of the Tell el-Yahudiyah ware only the shape has been considered. However, Egyptian fabrics can be distinguished from the Levantine ones. Therefore, it appears that during the Late Middle Kingdom more specimens were made of fabrics from Syria-Palestine, while later specimens were made mostly in Egyptian fabrics and very rarely in other fabrics.²²

Lastly, while the development of the Tell el-Yahudiyah ware has been reconstructed in its general lines and its chronology is generally known,²³ for this analysis it is actually the dating of the contexts that is important, because the present work is focused on how the objects were used during the Late Middle Kingdom and the Second Intermediate Period. Furthermore, the quality of the data reported in the publications used for the present work is often not good enough for using the Tell el-Yahudiyah ware for dating purposes. Therefore, only specimens coming from dated contexts have been included in the analysis.

THE LATE MIDDLE KINGDOM

Of the contexts of the Late Middle Kingdom with Tell el-Yahudiyah ware (Table 10 in Appendix I; Appendix VI), more than half come from Tell el-Dab'a,²⁴ where the greatest variety of types was also found. These contexts are both in burials and settlement.²⁵ Other contexts where Tell el-Yahudiyah ware has been found are from burials in Lisht²⁶ and in the Theban area,²⁷ from settle-

21 Brughmans 2013; Brughmans, Isaksen, and Earl 2012; Knappett 2013; Östborn and Gerding 2014, 81–83; Peeples and Roberts Jr. 2013, 3002.

22 As shown by the catalogues in: Aston and Bietak 2012; Kaplan 1980.

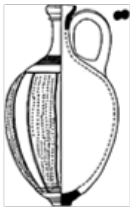
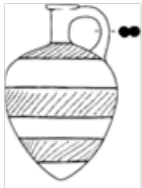
23 Aston and Bietak 2012, 551–56; Bietak 1989a.

24 Aston and Bietak 2012; Bietak 1968; Bietak 1975; Bietak, Mlinar, and Schwab 1991, 28; Kaplan 1980, fig. 128d; Schiestl 2009, 354 and fig. 310).

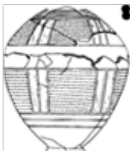
25 For a discussion on the contexts with Tell el-Yahudiyah ware from Tell el-Dab'a: Aston and Bietak 2012, 558.

26 Aston and Bietak 2012, 152, 169, 193, 288, 331; Bourriau 1996, 113 and fig. 8; Kaplan 1980, figs. 25a and 123a; Merrillees 1974b, 59 and fig. 49.

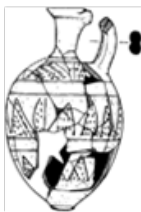
27 Aston and Bietak 2012, 288; Kaplan 1980, fig. 122a; Petrie and Walker 1909, 2–3 and pl. XII.

Type	Description	Outline
A.1.3-4	Rim: kettle, namely forming a convex curve, or candlestick, namely with the upper part first going outward and then slightly inward or up. Handle: bipartite; made of a strip of clay with two round sections. Body: ovoid, namely oval or egg-shaped. Base: small and slightly set-off. Surface: usually brown, with incisions at the base of the neck and sometimes just above the base. On the body are vertical bands filled with indentations, or three-to-five horizontal zones of oblique lines or chevron decoration or standing or pendant triangles.	
B.3.1	Rim: straight, without lip. Handle: bipartite, sloping outwards at the upper attachment; made of a strip of clay with two rounded sections and ending near the base of the neck at the lower joint. Body: piriform; taller than wide, with the largest circumference at the shoulder. Base: small, pointed, namely ending in a tip, and slightly set-off, namely not continuous with the body. Surface: brown burnished, with three horizontal decorative bands on the body.	
B.4	Rim: candlestick, namely with the upper part first going outward and then slightly inward or up. Handle: bipartite; made of a strip of clay with two round sections. Body: piriform; taller than wide, with the largest circumference at the shoulder. Base: small, disc, namely disc-shaped, and set-off, namely not continuous with the body. Surface: brown burnished, with four horizontal decorative bands on the body	
E.1	Rim: unknown. Handle: unknown. Body: biconical; with a sharper angle along the largest circumference, which is in the upper or middle part of the body. Base: unknown. Surface: red slipped, with five or more horizontal decorative bands on the body, of which three made of wavy bands filled with six-toothed comb imprints, and two made of running spirals.	
E.2	Rim: kettle, namely forming a convex curve. Handle: triple loop, going from the base of the handle to the base of the shoulder; made of a strip of clay with three round sections. Body: ovoid, namely oval or egg-shaped. Base: button, namely shaped like a button. Surface: four decorative bands with pendant or standing triangles on shoulder and body, with an incised wavy line both between the first and second bands, and between the third and fourth bands.	
F.1	Rim: rolled, namely thickened with rounded section. Handle: double; made of two attached straps of clay with round sections. Body: small piriform; small and taller than wide, with the largest circumference at the shoulder. Base: button, namely shaped like a button. Surface: one wide band of large rectangles around a major part of the body	

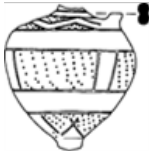
(continued)

Type	Description	Outline
F.3	Rim: kettle, namely forming a convex curve. Handle: double; made of two attached straps of clay with round sections. Body: piriform; taller than wide, with the largest circumference at the shoulder. Base: ring, namely shaped like a ring. Surface: incisions at the neck and three decorative bands with squares on the body	
F.4	Rim: probably kettle, namely forming a convex curve. Handle: double; made of two attached straps of clay with round sections. Body: piriform; taller than wide, with the largest circumference at the shoulder. Base: ring, namely shaped like a ring. Surface: incisions at the base of the neck and two bands of rectangles on the body, of which one on the upper body and one on the lower body.	
F.5	Rim: kettle, namely forming a convex curve. Handle: double; made of two attached straps of clay with round sections. Body: piriform; taller than wide, with the largest circumference at the shoulder. Base: ring, namely shaped like a ring. Surface: incisions at the base of the neck and two bands of rectangles on the body, of which one on the upper body and one on the lower body.	
H.1.2	Rim: candlestick, namely with the upper part first going outward and then slightly inward or up. Handle: tripartite, running from the base of the neck to halfway down the shoulder; made of three attached straps of clay with round sections. Body: piriform, nearly biconical; taller than wide, with a sharper angle along the largest circumference, which is at the shoulder. Base: low ring, namely shaped like a think ring. Surface: orange burnished, with incisions at the base of the neck and four decorative bands on the body, of which an upper large one with rectangles, one with pendant triangles, one with swimming fish, and a lower zone with connected standing and pendant triangles.	
I.1.5	Rim: kettle, namely forming a convex curve. Handle: double; made of two attached straps of clay with round sections. Body: piriform; taller than wide, with the largest circumference at the shoulder. Base: ring, namely shaped like a ring. Surface: incisions at the neck and four decorative bands on the body, varying for each vessel.	

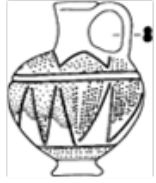
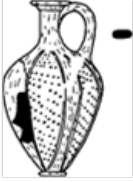
(continued)

Type	Description	Outline
I.2.2	Rim: kettle, namely forming a convex curve. Handle: double; made of two attached straps of clay with round sections. Body: piriform; taller than wide, with the largest circumference at the shoulder. Base: ring, namely shaped like a ring. Surface: incisions at the neck and three decorative bands on the body, with variations. One variation displays an upper band with standing triangles, a central band with rectangles, and a lower band with pendant triangles. Another variation displays an upper band with standing triangles, a central band with rectangles, and a lower band with rectangles. Another variation displays an upper band with standing triangles, a central band with joined pendant and standing triangles, and a lower band with standing triangles.	
I.2.3	Rim: candlestick, namely with the upper part first going outward and then slightly inward or up. Handle: double; made of two attached straps of clay with round sections. Body: piriform; taller than wide, with the largest circumference at the shoulder. Base: button, namely shaped like a button. Surface: incisions at the base of the neck and three decorative bands on the body, all with standing triangles or the upper band with pendant triangles, the central band with rectangles, and the lower band with pendant triangles.	
I.3.1	Rim: kettle, namely forming a convex curve. Handle: double; made of two attached straps of clay with round sections. Body: piriform; taller than wide, with the largest circumference at the shoulder. Base: ring, namely shaped like a ring. Surface: incisions at the base of the neck and two decorative bands, of which one on the upper body, with standing triangles, and one on the lower body, with pendant triangles.	
I.3.2	Rim: kettle, namely forming a convex curve. Handle: double; made of two attached straps of clay with round sections. Body: piriform; taller than wide, with the largest circumference at the shoulder. Base: disc or button, namely shaped like a disc or a button. Surface: incisions at the base of the neck and two decorative bands, of which one on the upper body, with standing triangles, and one on the lower body, with pendant triangles or, less commonly, intersecting pendant and standing triangles separated by a zigzag zone.	

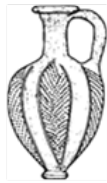
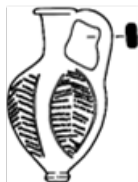
(continued)

Type	Description	Outline
I.5.1	Rim: candlestick, namely with the upper part first going outward and then slightly inward or up. Handle: double; made of two attached straps of clay with round sections. Body: small piriform; small and taller than wide, with the largest circumference at the shoulder. Base: ring, namely shaped like a ring. Surface: three decorative bands on the body, of which an upper and a lower one with intersecting pendant and standing triangles separated by zigzag zones, and a central one with rectangles.	
I.5.2	Rim: rolled, namely thickened with rounded section. Handle: double; made of two attached straps of clay with round sections. Body: small piriform; small and taller than wide, with the largest circumference at the shoulder. Base: button, namely shaped like a button. Surface: three decorative bands on the body, of which an upper one with standing triangles and a central and lower one with pendant triangles.	
I.5.3	Rim: rolled, namely thickened with rounded section. Handle: double; made of two attached straps of clay with round sections. Body: small piriform; small and taller than wide, with the largest circumference at the shoulder. Base: button, namely shaped like a button. Surface: three decorative bands on the body, with two variations. The first one sports an upper and a lower band with alternating pendant and standing triangles separated by a zigzag zone, and a central band with rectangles. The second variation sports an upper and middle band with intersecting pendant and standing triangles separated by a zigzag zone, and a lower band with pendant triangles.	
I.5.4	Rim: unknown. Handle: double; made of two attached straps of clay with round sections. Body: small piriform; small and taller than wide, with the largest circumference at the shoulder. Base: button, namely shaped like a button. Surface: three decorative bands on the body, of which the upper one with alternating pendant and standing triangles, a central one with rectangles, and a lower one with pendant triangles.	
I.5.5	Rim: unknown. Handle: double; made of two attached straps of clay with round sections. Body: small piriform; small and taller than wide, with the largest circumference at the shoulder. Base: button, namely shaped like a button. Surface: two decorative bands on the body, of which the upper one with standing triangles, and the lower one with pendant triangles.	

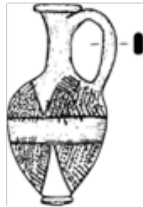
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Type	Description	Outline
I.6.1	Rim: rolled, namely thickened with rounded section. Handle: bipartite; made of a strip of clay with two round sections. Body: biconical; with a sharper angle along the largest circumference, which is in the upper or middle part of the body. Base: ring, namely shaped like a ring. Surface: three decorative bands on the body, of which the upper one with standing triangles, the central one with rectangles, and the lower one with pendant triangles.	
I.6.2	Rim: rolled, namely thickened with rounded section. Handle: bipartite; made of a strip of clay with two round sections. Body: biconical; with a sharper angle along the largest circumference, which is in the upper or middle part of the body. Base: ring, namely shaped like a ring. Surface: two decorative bands on the body, of which the upper one with standing triangles and the lower one with pendant triangles, and a horizontal filled band just above the base.	
I.6.3	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: biconical to piriform; with a sharper angle along the largest circumference, which is at the shoulder. Base: ring, namely shaped like a ring. Surface: two decorative bands on the body, of which the upper one with touching standing triangles and the lower one with touching pendant triangles, and a horizontal filled band just below it.	
J.1	Rim: candlestick, namely with the upper part first going outward and then slightly inward or up, or rolled, namely thickened with rounded section, or everted, namely going outward. Handle: double or strap; made of two attached straps of clay with round sections or one strap of clay with oval section. Body: piriform, to squat piriform, to biconical; with a sharp angle along the largest circumference, which is at the shoulder, or in the upper body, or in the middle of the body. Base: ring or button to offset button, namely shaped like a ring or a button, which can be not continuous with the body. Surface: sometimes burnished, with decoration of lotus flowers and lotus petals or birds on the shoulder and body, sometimes with rishi pattern.	
L.1.1	Rim: candlestick, namely with the upper part first going outward and then slightly inward or up. Handle: strap; made of a strip of clay with oval section. Body: piriform; taller than wide, with the largest circumference at the shoulder. Base: ring, namely shaped like a ring. Surface: decoration of vertical lozenges on the body, running from the shoulder to the base. These lozenges have incised contours and are filled with rows of dots made with a comb.	

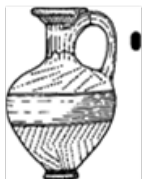
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Type	Description	Outline
L.I.2	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: large piriform; large and taller than wide, with the largest circumference at the shoulder. Base: ring or disc, namely shaped like a ring or a disc. Surface: decoration of large vertical lozenges on the body, running from the shoulder to the base. These lozenges have incised contours and are filled with rows of dots following a zig-zag pattern	
L.I.3	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: piriform to rounded; taller than wide, with a slightly larger circumference at the shoulder. Base: ring, namely shaped like a ring. Surface: burnished, with decoration of two-to-five vertical lozenges on the body, running from the shoulder to the base. These lozenges have incised contours and are filled with rows of dots following a herringbone pattern.	
L.I.4	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: piriform to rounded; taller than wide, with a slightly larger circumference at the shoulder. Base: disc, namely shaped like a disc. Surface: burnished, with decoration of two-to-four vertical lozenges on the body, running from the shoulder to the base. These lozenges have incised contours and are filled with rows of dots following a herringbone pattern.	
L.I.5	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: piriform to rounded; taller than wide, with a slightly larger circumference at the shoulder. Base: button, namely shaped like a button. Surface: burnished, with decoration of three or four vertical lozenges on the body, running from the shoulder to the base. These lozenges have incised contours and are filled with rows of dots following a herringbone pattern.	
L.I.6	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: large piriform to rounded; large and taller than wide, with a slightly larger circumference at the shoulder. Base: ring, namely shaped like a ring. Surface: burnished, with decoration of vertical lozenges on the body, running from the shoulder to the base. These lozenges have no contours and are made of rows of dots following a herringbone pattern.	

(continued)

Type	Description	Outline
L.1.7	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: piriform to rounded; taller than wide, with a slightly larger circumference at the shoulder. Base: ring, namely shaped like a ring. Surface: burnished, with decoration of vertical lozenges on the body, running from the shoulder to the base. These lozenges have no contours and are made of rows of dots following a herringbone pattern.	
L.2.1	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: slender piriform to biconical; slender and with a sharper angle along the largest circumference, which is at the shoulder. Base: ring, namely shaped like a ring. Surface: decorative bands on shoulder and body, made of non-touching rounded rectangles containing a herringbone pattern.	
L.2.2	Rim: ledged, namely with ledges on the outside. Handle: round; made of a strip of clay with round section. Body: ovoid, namely oval or egg-shaped. Base: ring, namely shaped like a ring. Surface: two decorative bands on the body, of which the upper one with standing triangles, and the lower one with pendant triangles.	
L.2.3	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: biconical; with a sharper angle along the largest circumference, which is in the upper or middle part of the body. Base: ring or offset disc, namely shaped like a ring or a disc not continuous with the body. Surface: two decorative bands on the body, of which the upper one with standing triangles, and the lower one with pendant triangles.	
L.2.4	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: biconical; with a sharper angle along the largest circumference, which is in the upper or middle part of the body. Base: button, namely shaped like a button. Surface: two decorative bands on the body, of which the upper one with standing triangles, and the lower one with pendant triangles. The triangles are filled with a herringbone pattern and can be touching or not.	
L.2.5	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: biconical to piriform; with a sharper angle along the largest circumference, which is at the shoulder. Base: ring, namely shaped like a ring. Surface: two decorative bands on the body, of which the upper one with standing triangles, and the lower one with pendant triangles. The triangles can be touching or not.	

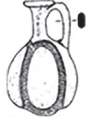
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Type	Description	Outline
L.3	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: biconical, also carinated. Base: disc or ring, namely shaped like a disc or a ring. Surface: one variation has decorative band on the shoulder, with filled standing triangles. Another variation has filled vertical lozenges on the body, running from the shoulder to the base and delineated by incised lines.	
L.4	Rim: rolled, namely thickened with rounded section, and with swollen neck, or everted. Handle: strap; made of a strip of clay with oval section. Body: biconical; with a sharper angle along the largest circumference, which is in the upper or middle part of the body. Base: ring or button, namely shaped like a ring or a button. Surface: burnished and with two decorative bands, of which one on the shoulder, with standing triangles, and one on the body, with pendant triangles.	
L.5.1	Rim: rolled, with swollen neck, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: biconical; with a sharper angle along the largest circumference, which is in the upper or middle part of the body. Base: ring, namely shaped like a ring. Surface: burnished and with two decorative bands of chevrons, of which one on the shoulder and upper body, and one on the lower body.	
L.5.2	Rim: rolled, namely thickened with rounded section, with swollen neck. Handle: strap; made of a strip of clay with oval section. Body: biconical; with a sharper angle along the largest circumference, which is in the upper or middle part of the body. Base: button, namely shaped like a button. Surface: burnished and with two decorative bands of chevrons, of which one on the shoulder and upper body, and one on the lower body.	
L.5.3	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: biconical; with a sharper angle along the largest circumference, which is in the upper or middle part of the body. Base: ring or disc, namely shaped like a ring or a disc. Surface: burnished and with two decorative bands, of which one on the shoulder and upper body, and one on the lower body. They can be filled with horizontal chevrons or with oblique lines, sometimes radiating from the base of the neck.	

(continued)

Type	Description	Outline
L.5.4	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: biconical; with a sharper angle along the largest circumference, which is in the upper or middle part of the body. Base: button, namely shaped like a button. Surface: burnished and with two decorative bands of chevrons, of which one on the shoulder and upper body, and one on the lower body.	
L.5.5	Rim: unknown. Handle: strap; made of a strip of clay with oval section. Body: biconical; with a sharper angle along the largest circumference, which is in the upper or middle part of the body. Base: button, namely shaped like a button. Surface: burnished and with one decorative band on the body, containing a wavy line.	
L.6	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: large biconical; large and with a sharper angle along the largest circumference, which is in the upper or middle part of the body. Base: ring, namely shaped like a ring. Surface: two decorative bands, of which one on the upper body and one on the lower body. They can be filled both with chevrons, or both with horizontal dots, or the upper one can contain diagonal lines and the lower one a herringbone pattern, or the upper one can contain standing triangles and the lower one large pendant triangles, all filled with a vertical herringbone pattern	
L.7	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: large biconical; large and with a sharper angle along the largest circumference, which is in the upper or middle part of the body. Base: round, making a round convex curve. Surface: two decorative bands on the body, of which a large upper one with non-delineated vertical chevrons, and a lower one with straight lines radiating out from the base.	
L.8.1	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: biconical; with a sharper angle along the largest circumference, which is in the upper or middle part of the body. Base: ring or disc, namely shaped like a ring or a disc. Surface: two decorative bands, of which one on the shoulder and upper body, and one on the lower body. Both can contain horizontal chevrons or oblique lines, or combine motives such as herringbone pattern, chevrons, horizontal dots, and oblique lines, by using one motive in one band and another one in the other band.	

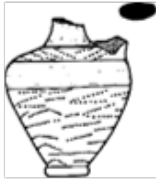
(continued)

Type	Description	Outline
L.8.2	Rim: rolled, namely thickened with rounded section. Handle: round; made of a strip of clay with round section. Body: bi-conical; with a sharper angle along the largest circumference, which is in the upper or middle part of the body. Base: round, making a round convex curve. Surface: two non-delineated bands with horizontal dots, of which one on the shoulder and upper body and one on the lower body and base.	
L.9.1	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: globular, namely with more or less spherical body, and wheel-made. Base: round, making a round convex curve. Surface: burnished, with two decorative bands on the body, of which the upper one with standing triangles and the lower one with pendant triangles.	
L.9.3	Rim: unknown. Handle: unknown. Body: globular, namely with spherical body, and wheel-made. Base: round, making a round convex curve. Surface: decorative band on the body, with three delineated circles filled with chevrons.	
L.9.4	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: drop-shaped, wheel-made; taller than wide, with the largest circumference near the base. Base: round, making a round convex curve. Surface: decorative band on the body, with three or four filled delineated lozenges.	
L.9.5	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: drop-shaped, wheel-made; taller than wide, with the largest circumference near the base. Base: round, making a round convex curve. Surface: one decorative band on the body, with non-delineated delineated lozenges, or two decorative bands on the body, with horizontal chevrons.	
L.9.6	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: large drop-shaped, wheel-made; taller than wide, with the largest circumference near the base. Base: round, making a round convex curve. Surface: two decorative bands, of which one on the shoulder and upper body with standing triangles, and one on the lower body with pendant triangles.	
L.10	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: quadri-lobal, with the body indented in such a way as to form four lobes. Base: round, making a round convex curve. Surface: each of the four lobes is encircled by incised decoration.	

(continued)

Type	Description	Outline
L.11	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: cylindrical, without change in the circumference. Base: ring, namely shaped like a ring. Surface: decoration of vertical chevrons or herringbone pattern on the body.	
L.12.1	Rim: rolled, namely thickened with rounded section, or everted, namely going outward. Handle: strap; made of a strip of clay with oval section. Body: cylindrical, without change in the circumference. Base: rounded, making a rounded convex curve. Surface: decoration of standing triangles or alternating standing and pendant triangles on the body.	
L.12.2	Rim: rolled, namely thickened with rounded section, or everted, namely going outward. Handle: strap; made of a strip of clay with oval section. Body: cylindrical, without change in the circumference. Base: rounded, making a rounded convex curve. Surface: decoration of horizontal or vertical chevrons, or of oblique or horizontal striations, or a mix of oblique lines and chevrons, on the body.	
L.13.1	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: piriform; taller than wide, with the largest circumference at the shoulder. Base: disc, namely shaped like a disc. Surface: incised horizontal grooves on shoulder, body, and base.	
L.13.2	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: biconical to piriform; with a sharper angle along the largest circumference, which is at the shoulder. Base: ring or disc, namely shaped like a ring or a disc. Surface: incised horizontal grooves on shoulder and body.	
L.13.4	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: cylindrical, without change in the circumference. Base: rounded, making a rounded convex curve. Surface: incised horizontal grooves on body and base.	
L.14.1	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: small piriform to spherical; small and taller than wide, with the largest circumference nearly in the middle. Base: ring, namely shaped like a ring. Surface: decoration on the body, made of three or four lozenges filled with a herringbone pattern.	

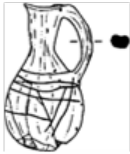
(continued)

Type	Description	Outline
L.14.2	Rim: rolled, namely thickened with rounded section. Handle: strap; made of a strip of clay with oval section. Body: small piriform to spherical; small and taller than wide, with the largest circumference nearly in the middle. Base: button, namely shaped like a button. Surface: decoration on the body, made of three or four lozenges filled with a herringbone pattern.	
L.14.4	Rim: unknown. Handle: strap; made of a strip of clay with oval section. Body: small piriform to spherical; small and taller than wide, with the largest circumference nearly in the middle. Base: ring, namely shaped like a ring. Surface: two decorative bands, of which one on shoulder and upper body, and one on the lower body. The upper band can contain standing triangles and the lower one can contain pendant triangles, or they can both be filled with lines of dots.	
L.15.1	Rim: in the beak, sometimes with spout. Handle: single or double; made of one strap of clay with oval section or two attached straps of clay with round sections. Body: shaped like a duck, sometimes with two bodies. Base: flat, as large as the body. Surface: decorated with rishi design or with comb incision.	
L.15.2	Rim: rolled, namely thickened with rounded section, rising from the head. Handle: strap; made of a strip of clay with oval section. Body: shaped like a hawk. Base: made of the end of the tail and of the legs. Surface: incised striations on wings, chest and back.	
L.15.3	Rim: rolled, namely thickened with rounded section, rising from the mouth. Handle: strap or bipartite, going from the mouth to under the gills; made of a strip of clay with one oval section or two round sections. Body: shaped like a fish, with dorsal and back fins made through a ridge and the ventral fins projected. Base: made of the end of the tail and of the legs. Surface: details, such as the eyes and the gills, are drawn, while the body is covered with a herringbone pattern.	
L.15.5	Rim: rising from the back. Handle: unknown. Body: shaped like a quadruped, probably a cow. Base: made of the end of the legs. Surface: lines of incised dots.	

(continued)

Type	Description	Outline
M.1	Rim: rolled, namely thickened with rounded section. Handle: double; made of two attached straps of clay with round sections. Body: piriform; taller than wide, with the largest circumference at the shoulder. Base: button or offset disc, namely shaped like a button or a disc not continuous with the body. Surface: decoration of lozenges filled with zig-zag motives on body and shoulder.	
M.2	Rim: rolled, namely thickened with rounded section. Handle: double; made of two attached straps of clay with round sections. Body: piriform; taller than wide, with the largest circumference at the shoulder. Base: ring, namely shaped like a ring. Surface: decoration of non-delineated lozenges filled with zig-zag motives on body and shoulder.	
N.1	Rim: with cut-away spout. Handle: double, pushed through the vessel wall; made of two attached straps of clay with round sections. Body: globular, namely with spherical body, and handmade. Base: round, making a round convex curve. Surface: brown polished, namely smoothed when nearly dry before firing, and burnished. Incisions are at the base of the neck and three decorative bands on the body, of which the upper one with standing triangles delineated by multiple incised lines, the central one with a zigzag delineated by multiple incised lines, and the lower one with groups of three incised lines in a zigzag pattern.	
N.2	Rim: slightly everted, namely going outwards, or kettle, namely forming a convex curve. Handle: double, pushed through the vessel wall; made of two attached straps of clay with round sections. Body: globular, namely with spherical body, and handmade. Base: round, making a round convex curve. Surface: brown polished, namely smoothed when nearly dry before firing, and burnished, with three variations for the decorative bands on the body. The first variation has an incised line at the height of the base of the handle and, starting from there, vertical incised lines running down towards the base. The second variation has two bands with standing triangles, and the third one has an upper band with standing triangles and a lower band with groups of three incised lines in zigzag.	

(continued)

Type	Description	Outline
N.3	Rim: slightly everted, namely going outward or kettle, namely forming a convex curve. Handle: strap, pushed through the vessel wall; made of a strip of clay with oval section. Body: globular, namely with spherical body, and handmade. Base: round, making a round convex curve. Surface: brown polished, namely smoothed when nearly dry before firing, and burnished, with two variations for the decorative bands on the body. The first variation has two bands with alternating standing and pendant triangles. The second variation has a band with alternating standing and pendant triangles, and a band with pendant triangles.	
N.4	Rim: upright. Handle: double, pushed through the vessel wall and running from the rim to low on the shoulder; made of two attached straps of clay with round sections. Body: globular, namely with spherical body, and handmade. Base: round, making a round convex curve. Surface: brown polished, namely smoothed when nearly dry before firing, and burnished, with four variations for the decorative bands on the body. The first variation has a band wrapped around the body. The second variation has a band of intersecting standing and pendant triangles separated by a reserved zigzag. The third variation has a horizontal band filled with vertical lines of dots above and a row of standing triangles below. The fourth variation has two bands of standing triangles.	
N.5	Rim: slightly everted, namely going outward, or kettle, namely forming a convex curve. Handle: double, pushed through the vessel wall and running from the rim to low on the shoulder; made of two attached straps of clay with round sections. Body: globular, namely with spherical body, and handmade. Base: round, making a round convex curve. Surface: brown polished, namely smoothed when nearly dry before firing, and burnished, incised decoration at the base of the neck and with a horizontal decorative band around the upper belly with impressed zigzag.	
N.6	Rim: everted, namely going outward. Handle: strap, pushed through the vessel wall and running from the rim to low on the shoulder; made of a strip of clay with oval section. Body: globular, namely with spherical body, and handmade. Base: round, making a round convex curve. Surface: brown polished, namely smoothed when nearly dry before firing, and burnished, with horizontal and oblique lines on the body.	

(continued)

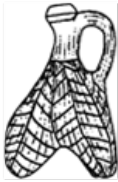
Type	Description	Outline
N.7	Rim: rolled, namely thickened with rounded section. Handle: double, pushed through the vessel wall and running from the rim to low on the shoulder; made of two attached straps of clay with round sections. Body: trilobal, divided into three vertical sections, handmade. Base: trilobal, made of three parts. Surface: brown polished, namely smoothed when nearly dry before firing, and burnished, with incised lines on shoulder and body.	
N.9	Rim: rolled, namely thickened with rounded section. Handle: double, pushed through the vessel wall and running from the rim to low on the shoulder; made of two attached straps of clay with round sections. Body: squat piriform, handmade; wider than tall, with the largest circumference at the shoulder. Base: ring, namely shaped like a ring. Surface: brown polished, namely smoothed when nearly dry before firing and burnished, with rishi pattern decoration around the neck.	
O	Rim: ridged, namely with ridges on the outside. Handle: none. Body: jar, open vessel with S-profile. Base: round, making a round convex curve. Surface: two horizontal decorative bands of dots filled with a white pigment.	
P.1.2	Rim: modelled, namely thickened or folded over, with triangular section. Handle: two or four. Body: dish. Base: probably ring, namely shaped like a ring. Surface: no decoration visible.	
P.2	Rim: modelled, namely thickened or folded over, with triangular section. Handle: none. Body: open vessel, probably a cup. Base: probably ring, namely shaped like a ring. Surface: decoration of spirals and zigzag.	
P.4	Rim: direct, with no modelling. Handle: none. Body: cup, open slender vessel with S-profile. Base: unknown. Surface: decoration of lotus flowers.	
P.5	Rim: direct, with no modelling. Handle: none. Body: beaker, open slender vessel with elongated S-profile. Base: rounded, making a rounded convex curve. Surface: decoration of lotus flowers.	

Table 4: Description and outline of the main types of Tell el-Yahudiyah ware. Drawings after Aston and Bietak 2012.

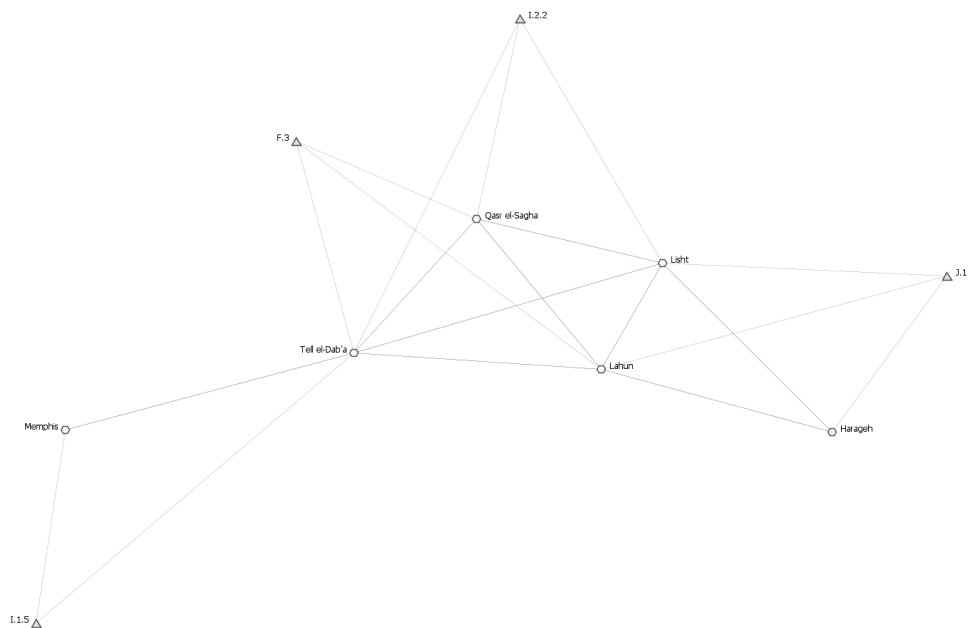


Figure 75: Contexts of the Late Middle Kingdom and the most common types of Tell el-Yahudiyah ware.

ment in Memphis,²⁸ Qasr el-Sagha,²⁹ and Lahun,³⁰ and from both burials and settlement in Harageh.³¹ All in all, the contexts are nearly evenly split between funerary and settlement ones, and the types do not show a great variety.

The most common types of Tell el-Yahudiyah ware found in Late Middle Kingdom contexts, visible in Figure 75, are jugs and juglets: with piriform body and kettle rim, double handle, ring base, and decorative bands on the body with squares, rectangles and standing and pendant triangles; with piriform, to squat piriform, to biconical body and candlestick, or rolled, or everted rim, double or strap handle, ring or button to offset button base, and decoration of lotus flowers and lotus petals or birds and sometimes rishi pattern on the shoulder and body (types F.3, I.1.5, I.2.2, J.1). Also recovered in contexts of this period are jugs and juglets: with ovoid body, kettle or candlestick rim, bipartite handle, and slightly set-off base, and incised vertical bands or horizon-

28 Aston and Bietak 2012, 144; Bader 2009, 497.

29 Aston and Bietak 2012, 137 and 152; Šliwa 1992a, 188.

30 Aston and Bietak 2012, 137, 193, 265; Kaplan 1980, 89–90, figs. 8b and 28a; Merrillees 1974b, 64, figs. 42 and 56; Petrie et al. 1891, 10. However, the stratigraphic situation left to us by the excavator is not clear. Therefore, while the specimen of Tell el-Yahudiyah ware here examined is considered to come from a context of the Late Middle Kingdom, future research could indicate a slightly different date for it.

31 Aston and Bietak 2012, 169 and 200; Engelbach and Gunn 1923, 10–13 and pls. X, XLI, LVIII–LXII; Kaplan 1980, figs. 37 a–b and 126e; Merrillees 1974b, 64 and fig. 51b.

tal bands of oblique lines or chevron or standing or pendant triangles on the body; with biconical body, red slipped surface with horizontal bands of wavy lines and spirals; with small piriform body, rolled rim, double handle, button base, and a band of large rectangles on the body; with piriform body, kettle rim, double handle, ring base, and bands of large rectangles on the body; with piriform body, kettle rim, double handle, ring or button or disc base, and bands of large rectangles or standing and pendant triangles on the body; with piriform body, candlestick rim, double handle, button base, and bands of rectangles and triangles and pendant triangles on the body; with nearly biconical body, candlestick rim, tripartite handle, ring base, and bands of rectangles and pendant triangles and fish on the body; with cylindrical body, rolled or everted rim, strap handle, rounded base, and standing and pendant triangles on the body; duck-shaped with single or double handle and sometimes with spout; hawk-shaped with strap handle; handmade with globular body, slightly everted or kettle rim, double handle, round base, and decorations of incised lines or stranding triangles and/or zig-zag patterns (types A.1.3-4, E.1, F.1, F.5, H.1.2, I.2.3, I.3.1, I.3.2, L.12.1, L.15.1, L.15.2, N.2, N.5). Lastly, during this period are found also open vessels with modelled rim and decorations of spirals and zig-zag patterns (type P.2).

As far as the fabrics are concerned, they are mostly of Egyptian origins. Only in Memphis and Tell el-Dab'a fabrics of Levantine origins, namely from Syria-Palestine, are reported.

The first one-mode graph

The network detected for the Late Middle Kingdom on the basis of the Tell el-Yahudiyah ware (Figures 76–79) involves mostly Tell el-Dab'a, Qasr el-Sagha, Lahun, and Lisht, thus the sites in Lower Egypt and in the Memphis-Fayyum area. The specimen in the Theban area is of a type not shared with the other sites and, given that its fabric is not known, it cannot be determined if it was locally produced or if it was transported there from another place.

Concerning the centrality measures (Tables 28, 41, 54, 67 in Appendix II), the closeness centrality is very similar for all the sites, thus it is not very informative because it does not show differences in how the sites could be reached in the network. Furthermore, Tell el-Dab'a, Lisht, Lahun, and Qasr el-Sagha score in the high ranks for the degree and the eigenvector centrality. Therefore, they are the better-connected sites, namely the sites with higher amount and the better type of connections, in the network of the Tell el-Yahudiyah ware. Harageh has a similar pattern too, but it scores in the middle ranks: this would suggest a less prominent role for the site in the network.

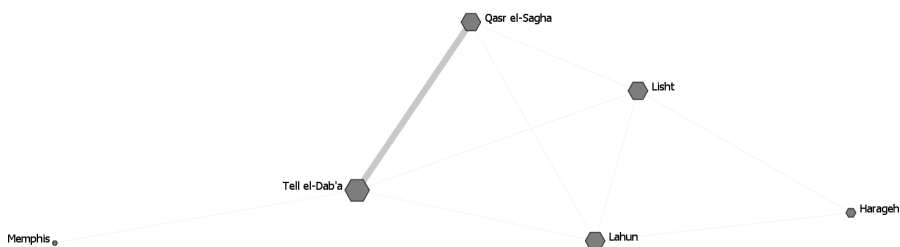


Figure 76: Degree centrality of the first one-mode graph of the Tell el-Yahudiyah ware during the LMK.

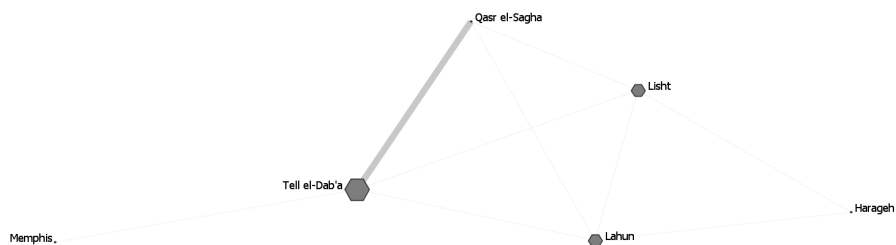


Figure 77: Betweenness centrality of the first one-mode graph of the Tell el-Yahudiyah ware during the LMK.

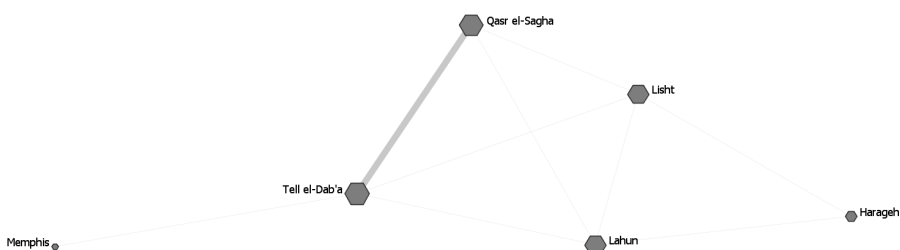


Figure 78: Eigenvector centrality of the first one-mode graph of the Tell el-Yahudiyah ware during the LMK.

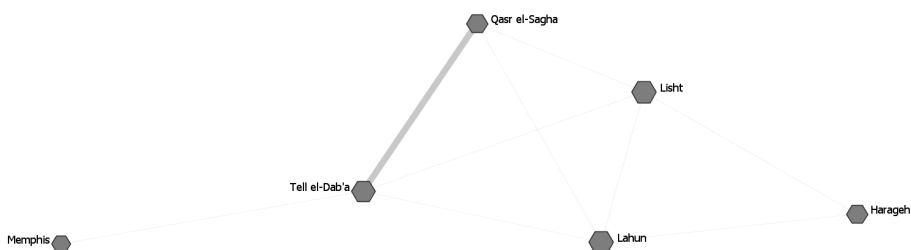


Figure 79: Closeness centrality of the first one-mode graph of the Tell el-Yahudiyah ware during the LMK.

In addition, Tell el-Dab'a has a very high score also for the betweenness centrality. This suggests its role also as an intermediary in the network of the Tell el-Yahudiyah ware. Lastly, Memphis and the Theban area, score in low or very low ranks. This implies that they created no, or very weak, connections in the network of the Tell el-Yahudiyah ware, based on the available data. While, especially in the case of Memphis, the results could partially derive from the fact that Tell el-Yahudiyah ware was not much used in settlements, they also seem to depend on the type found at the site, which is less common than types found at other settlements, such as Qasr el-Sagha.

The one-mode graph based on the Jaccard similarity

The structure of the network constructed through the Jaccard algorithm (Figures 80–83) is, as usual, like the one of the first one-mode graph, detected based on the shared types. The centrality measures (Tables 80, 93, 106, 119 in Appendix III) again show that the closeness centrality is similar for all the sites, with the exception of the Theban area, that scores lower than the other sites; however, only one specimen from the site is included in the analysis, thus the results need to be taken carefully.

Concerning the other centrality measures, they follow a pattern like the one of the first one-mode graph for Memphis, the Theban area, Lahun, and Qasr el-Sagha. Therefore, while the last two are still among the better-connected sites, the first two are the sites with the lowest scores in the network of the Tell el-Yahudiyah ware. Lisht and Harageh have a similar pattern too, but they respectively score higher for the betweenness and the eigenvector centrality. Hence, they appear slightly more important in the network of Tell el-Yahudiyah ware when their full range of types is considered. This difference derives from the fact that their range of types of Tell el-Yahudiyah ware did not include many of the types more in common among the sites.

Lastly, Tell el-Dab'a has a pattern in the second one-mode graph, because it has high or very high scores for the betweenness centrality and the closeness centrality, thus displaying the pattern of an intermediary in the network of the Tell el-Yahudiyah ware. Also in this case, the difference is made by the amount more common types found in the range of Tell el-Yahudiyah ware: they form the major part, so that they give a more prominent role to the site when only the types in common are considered.

Summary

During the Late Middle Kingdom, the main players in the network created by the Tell el-Yahudiyah ware are Qasr el-Sagha, Lahun, Lisht and, especially when the full range of types is examined, Harageh. Thus, these could be the

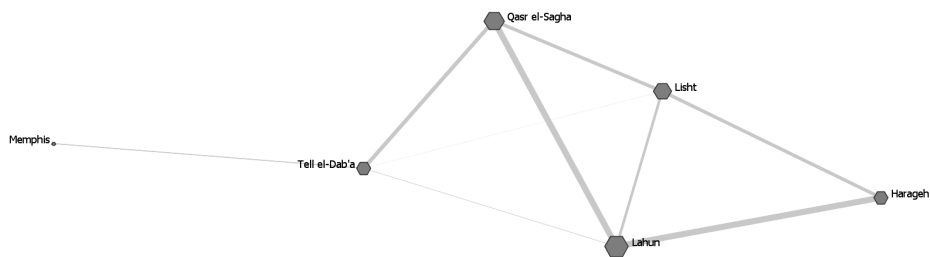


Figure 80: Degree centrality of the second one-mode graph of the Tell el-Yahudiyah ware during the LMK.

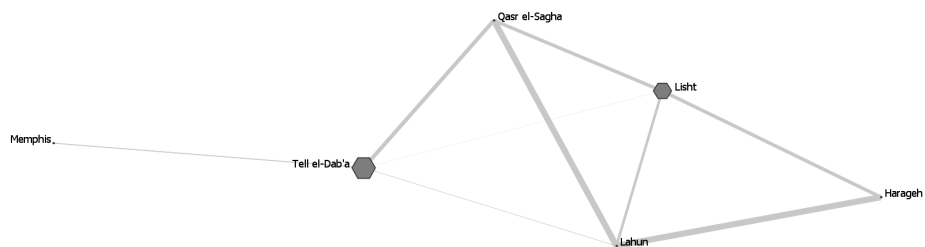


Figure 81: Betweenness centrality of the second one-mode graph of the Tell el-Yahudiyah ware during the LMK.

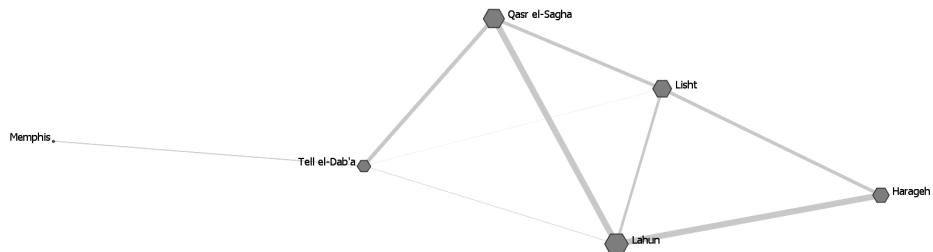


Figure 82: Eigenvector centrality of the second one-mode graph of the Tell el-Yahudiyah ware during the LMK.

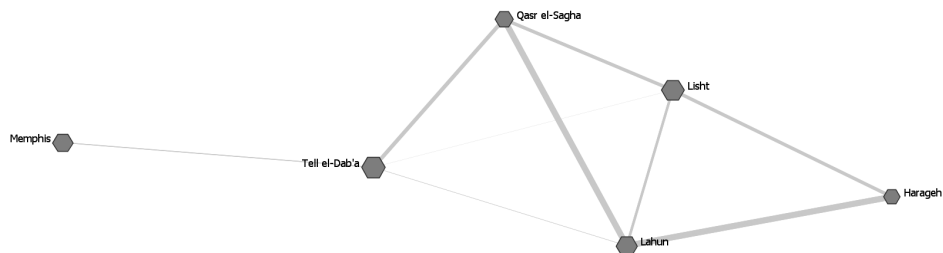


Figure 83: Closeness centrality of the second one-mode graph of the Tell el-Yahudiyah ware during the LMK.

starting or ending points of the lines of communication in the network, and where new trends could be spread from.³² Tell el-Dab'a was probably among the better-connected sites, and constantly appear as an intermediary, thus as a passageway or a (re)distribution centre: the Tell el-Yahudiyah ware could be channelled or (re)distributed from there. Lisht probably played a similar role, too.³³

THE EARLY SECOND INTERMEDIATE PERIOD

The sites with Tell el-Yahudiyah ware analysed for this period are only three (Table 16 in Appendix I; Appendix VII) and include Tell el-Dab'a,³⁴ Memphis,³⁵ both of which are also found in the analysis of the Late Middle Kingdom, and Abydos.³⁶ Tell el-Dab'a³⁷ counts for nearly the totality of the contexts with Tell el-Yahudiyah ware, nearly all from burial contexts, and in a few instances from the settlement.³⁸ The variety of types is still noticeable, like in the Late Middle Kingdom. For Memphis³⁹ and Abydos⁴⁰ only one example each has been included in the analysis, respectively from a settlement and from a burial context.

As visible in Figure 84, the types found in this period are jugs and juglets: with piriform body, straight direct rim, bipartite handle, pointed base, and horizontal bands of lines on the body; with piriform body, candlestick rim, bipartite handle, disc base, and horizontal bands of lines on the body; with piriform body, candlestick rim, double handle, button base, and decoration of standing or pendant triangles and rectangles on the body, found also in the Late Middle Kingdom; with piriform body, candlestick rim, strap handle, ring base, and decoration of filled lozenges on the body; with piriform body, kettle rim, double handle, ring or disc or button base, and bands of rectangles and/or standing and/or pendant triangles on the body, which are found also during the Late Middle Kingdom; with small piriform body, candlestick rim, dou-

32 Östborn and Gerding 2015.

33 Gjesfeld 2015; Rivers, Knappett, and Evans 2013.

34 Aston and Bietak 2012; Bietak 1970; Bietak, Mlinar, and Schwab 1991, 64–67 and 86–91; Forstner-Müller 2008, 140–217; Kaplan 1980, figs. 16b, 27c, 34 a and d; McGovern and Harbottle 1997, 107 and pl. 9d.

35 Aston and Bietak 2012, 144; Bader 2009, 497.

36 Aston and Bietak 2012, 169; Peet and Loat 1913, 54 and pl. XIII.

37 Aston and Bietak 2012; Bietak 1970; Bietak, Mlinar, and Schwab 1991, 64–67 and 86–91; Forstner-Müller 2008, 140–217; Kaplan 1980, figs. 16b, 27c, 34a and d; McGovern and Harbottle 1997, 107 and pl. 9d.

38 There is the possibility that the specimens from settlement contexts come from tombs or temples: Aston and Bietak 2012, 558.

39 Aston and Bietak 2012, 144; Bader 2009, 497.

40 Aston and Bietak 2012; Peet and Loat 1913, 54 and pl. XIII.

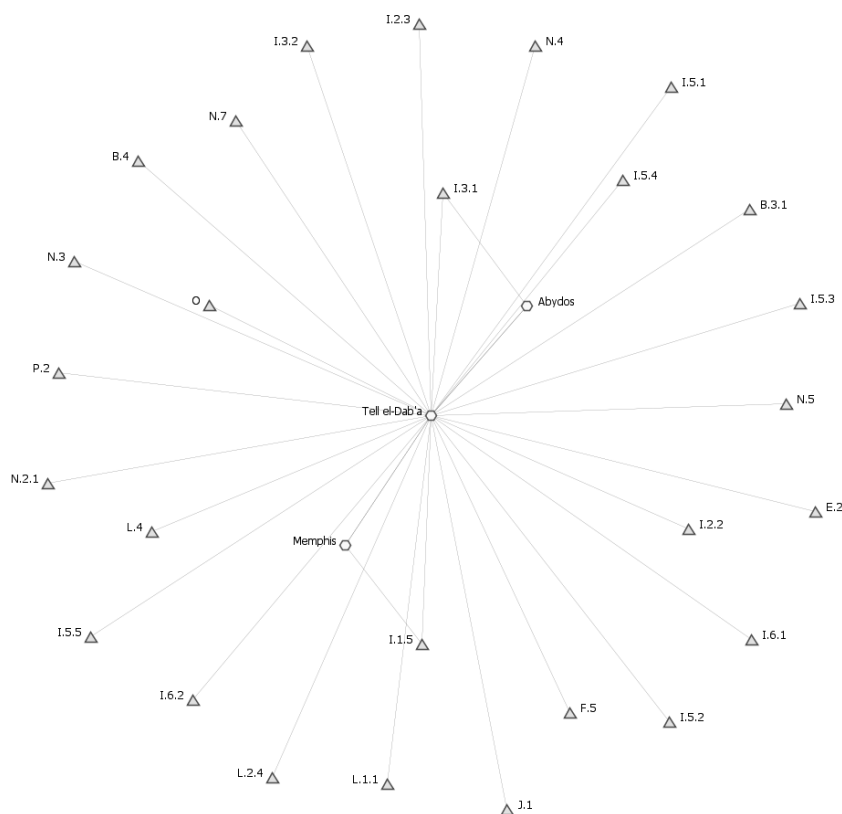


Figure 84: Contexts of the Early Second Intermediate Period and their Tell el-Yahudiyah ware.

ble handle, ring base, and decoration of standing and pendant triangles and rectangles and zig-zag lines on the body; with small piriform body, rolled rim, double handle, button base, and decoration of standing and pendant triangles and rectangles and zig-zag lines on the body; with ovoid body, kettle rim, triple loop handle, button base, and bands of standing and pendant triangles and wavy lines on the body; with biconical body, rolled rim, bipartite handle, ring base, and decoration of standing and pendant triangles and rectangles on the body; with biconical body, rolled rim, strap handle, button base, and decoration of filled standing and pendant triangles on the body; with biconical body, rolled and with swollen neck or everted rim, strap handle, ring or button base, and decoration of standing and pendant triangles on the body; with piriform, to squat piriform, to biconical body, candlestick or rolled or everted rim, double or strap handle, ring or button to offset button base, and decoration of lotus flowers and lotus petals or birds and sometimes rishi pattern on the shoulder and body; handmade with globular body, slightly everted or kettle rim, double or strap handle, round base, and decoration of vertical lines and/or standing and /or pendant triangles and/or zig-zag patterns on the body,

which are found also in the Late Middle Kingdom (in particular types N.2 and N.5); with trilobal body, thickened rolled rim, double handle, trilobal base, and decoration of incised lines on body and shoulder (types B.3.1, B.4, which is probably an heirloom, E.2, F.5, I.1.5, I.2.2, I.2.3, I.3.1, I.3.2, I.5.1, I.5.2, I.5.3, I.5.4, I.5.5, I.6.1, I.6.2, J.1.2, J.1.4, J.1.5, J.1.6, L.1.1, L.2.4, L.4, N.2, N.3, N.4, N.5, N.7). Lastly, during this period are found also open vessels with ridged rim and S-profile and decoration of filled dots, or with modelled rim and decorations of spirals and zig-zag patterns (types O and P.2); the latter is found also in the Late Middle Kingdom.

Regarding the fabrics, they are mostly of Egyptian origins. Fabrics of Levantine origins are quite rarer than during the Late Middle Kingdom and are recorded only in Memphis⁴¹ and in Tell el-Dab'a.⁴²

Contacts in the Early Second Intermediate Period

For the Early Second Intermediate Period (Figure 85), only Tell el-Dab'a shares one type, with each of the other two sites in the network, namely Abydos and Memphis. This shows contacts between Tell el-Dab'a and the other two sites during this period. However, the sample examined is very small, and most specimens come from Tell el-Dab'a. Therefore, the possibility for further contacts, not yet visible through the available data, even between more sites should be kept in mind.

So far, it can only be remarked that the available results show what is suggested also from other sources, such as pottery and stelae: that there were contacts, though not always intense, between Tell el-Dab'a and Memphis⁴³ and Abydos.⁴⁴

THE LATE SECOND INTERMEDIATE PERIOD

Of the sites with Tell el-Yahudiyah ware examined for this period (Table 22 in Appendix I; Appendix VIII), only Tell el-Dab'a⁴⁵ is present in the analysis

41 Aston and Bietak 2012, 144; Bader 2009, 497.

42 Aston and Bietak 2012; Bietak 1970; Bietak, Mlinar, and Schwab 1991, 64–67 and 86–91; Forstner-Müller 2008, 140–217; Kaplan 1980, figs. 16b, 27c, 34 a and d; McGovern and Harbottle 1997, 107 and pl. 9d.

43 Bader 2007; Bader 2008; Bader 2009; Mourad 2013.

44 Mourad 2013.

45 Adam 1959, 207 and pl. 16.2; Aston and Bietak 2012; Bader 2009, 129 and fig. 59; Bietak 1968; Bietak 1970; Bietak 1990; Bietak, Mlinar, and Schwab 1991, 54–57 and 112–113; Forstner-Müller 2008, 221–384; Fuscaldo 2000, 82; Kaplan 1980, figs. 6a and c and e, 16c, 22d, 34c, 50a and d–g, 92b, 93a, 127b and d, 128a; Kopetzky 2008, 198–200, figs. 3–4 and 6; V. Müller 2008, 294 and fig. 168.

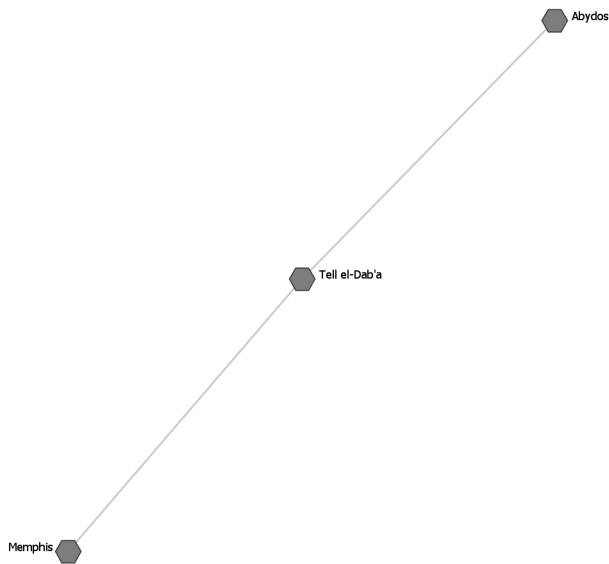


Figure 85: First one-mode graph of the Tell el-Yahudiyah ware during the ESIP.

of both previous periods, while Harageh⁴⁶ and Abydos⁴⁷ are part of the analysis not only of the Late Second Intermediate Period, but also respectively of the Late Middle Kingdom and the Early Second Intermediate Period. The remaining sites, namely Tell el-Yahudiyah,⁴⁸ Sedment,⁴⁹ Mostagedda,⁵⁰ Hu,⁵¹ Tell Hebua,⁵² Rifeh,⁵³ and Edfu,⁵⁴ are included only in the analysis of the Late Second Intermediate Period.

46 Aston and Bietak 2012, 257; Engelbach and Gunn 1923, 2–5 and 10–13, pls. XLI and LVIII–LXII; Kaplan 1980, fig. 19c.

47 Aston and Bietak 2012, 200, 231, 257; Garstang, Newberry, and Milte 1901, 12; Randall-MacIver, Mace, and Griffith 1902, 92, 97–98.

48 Adam 1958, 309; Aston and Bietak 2012, 206–88; Griffith 1890, 39–40; Kaplan 1980, figs. 7c, 13f, 14b, 22a–d, 47a, 57d, 86b, 90a and c, 92c, 94c, 95c and e, 100f, 121a, 125 e–f, 126 a–d; Petrie and Duncan 1906, 11 and 15.

49 Aston and Bietak 2012, 278; Kaplan 1980, fig. 117d; Petrie and Brunton 1924, pls. XLV–XLVI.

50 Aston and Bietak 2012, 265; Brunton and Morant 1937, 117.

51 Aston and Bietak 2012, 206 and 231; Bourriau 2009, 72; Kaplan 1980, figs. 46a and 85d; Petrie and Mace 1901, 50–52.

52 Aston and Bietak 2012, 288; Maksoud 1998, 201–2.

53 Aston and Bietak 2012, 206–11 and 254–57; Petrie, Thompson, and Crum 1907, 20–21.

54 Aston and Bietak 2012, 257; Kaplan 1980, fig. 17e.

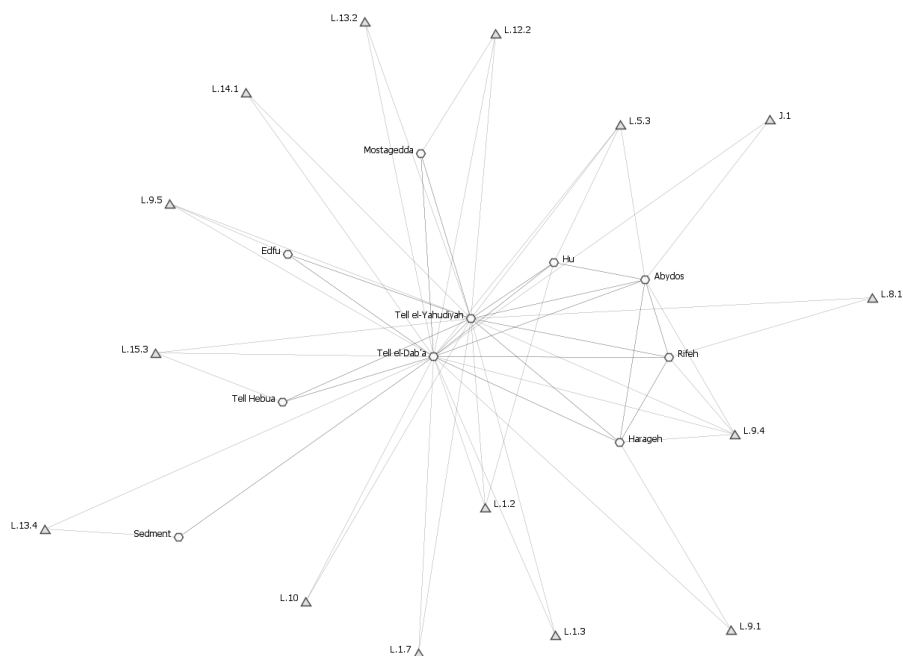


Figure 86: Contexts of the Late Second Intermediate Period and the most common types of Tell el-Yahudiyah ware.

Nearly all the contexts analysed, and also the greatest variety of types, are found in Tell el-Dab'a⁵⁵ and in Tell el-Yahudiyah.⁵⁶ Unfortunately, for the latter it is not possible to know the exact number of contexts where the pottery has been found. Nevertheless, both sites have contributed both burial and settlement contexts.⁵⁷

55 Adam 1959, 207 and pl. 16.2; Aston and Bietak 2012, 129 and fig. 59; Bietak 1968; Bietak 1970; Bietak 1990; Bietak, Mlinar, and Schwab 1991, 54–57 and 112–113; Forstner-Müller 2008, 221–384; Fuscaldò 2000, 82; Kaplan 1980, figs. 6a and c and e, 16c, 22d, 34c, 50a and d–g, 92b, 93a, 127b and d, 128a; Kopetzky 2008, 198–200, figs. 3–4 and 6; V. Müller 2008, 294 and fig. 168.

56 Adam 1958, 309; Aston and Bietak 2012, 206–88; Griffith 1890, 39–40; Kaplan 1980, figs. 7c, 13f, 14b, 22a–d, 47a, 57d, 86b, 90a and c, 92c, 94c, 95c and e, 100f, 121a, 125 e–f, 126 a–d; Petrie and Duncan 1906, 11 and 15.

57 There is the possibility that the specimens from settlement contexts come from tombs: Aston and Bietak 2012, 558.

Burial contexts with Tell el-Yahudiyah ware are found also in Harageh,⁵⁸ Sedment,⁵⁹ Rifeh,⁶⁰ Mostagedda,⁶¹ Abydos,⁶² Hu,⁶³ and Edfu,⁶⁴ while settlement contexts come from Tell Hebua.⁶⁵ However, generally speaking, the contexts examined are nearly evenly split between burial and settlement contexts.

During the Late Second Intermediate Period, as visible in Figure 86, the most common type of Tell el-Yahudiyah ware retrieved at the sites includes jugs and juglets with piriform to rounded body, rolled rim, strap handle, ring base, and decoration of filled lozenges on the body (type L.1.3), followed by jugs and juglets: with piriform to rounded body, rolled rim, strap handle, disc or button base, and decoration of filled lozenges on the body; with biconical body, rolled rim, strap handle, ring or disc base, and bands of oblique lines or chevrons on the body and shoulder (types L.1.4, L.1.5, L.5.3, and L.9.4).

Less common during this period are jugs and juglets: with piriform, to squat piriform, to biconical body, candlestick or rolled or everted rim, double or strap handle, ring or button to offset button base, and decoration of lotus flowers and lotus petals or birds and sometimes rishi pattern on the shoulder and body, found also in the previous two periods; with large piriform body, rolled rim, strap handle, ring or disc base, and decoration of filled lozenges on the body; with piriform to rounded body, rolled rim, strap handle, ring base, and decoration of filled lozenges on the body; with small piriform body, rolled rim, strap handle, ring base, and decoration of filled lozenges on the body; with biconical body, rolled rim, strap handle, ring or disc base, and bands of chevrons and/or oblique lines and/or herringbone pattern on the body; with biconical to piriform body, rolled rim, strap handle, and incised grooves on shoulder and body; with globular or large drop-shaped body, rolled rim, strap handle, round base, and decoration of standing and pendant triangles on the body; with drop-shaped body, rolled rim, strap handle, round base, with decoration of lozenges or bands of chevrons on the body; with quadrilobal body, rolled rim, strap handle, round base, and incised decoration; with cylindrical body, rolled or everted rim, strap handle, rounded base, and decoration of

58 Aston and Bietak 2012, 257; Engelbach and Gunn 1923, 2–5 and 10–13, pls. XLI and LVIII–LXII; Kaplan 1980, fig. 19c.

59 Aston and Bietak 2012, 278; Kaplan 1980, fig. 117d; Petrie and Brunton 1924, pls. XLV–XLVI.

60 Aston and Bietak 2012, 206–11 and 254–57; Petrie, Thompson, and Crum 1907, 20–21.

61 Aston and Bietak 2012, 265; Brunton and Morant 1937, 117.

62 Aston and Bietak 2012, 200, 231, 257; Garstang, Newberry, and Milte 1901, 12; Randall-MacIver, Mace, and Griffith 1902, 92, 97–98.

63 Aston and Bietak 2012, 206 and 231; Bourriau 2009, 72; Kaplan 1980, figs. 46a and 85d; Petrie and Mace 1901, 50–52.

64 Aston and Bietak 2012, 257; Kaplan 1980, fig. 17e.

65 Aston and Bietak 2012, 288; Maksoud 1998, 201–2.

chevrons and/or oblique lines or horizontal striations on the body; with cylindrical body, rolled rim, strap handle, rounded base, and incised grooves on body and base; fish-shaped, with strap or bipartite handle (types J.1, L.1.2, L.1.7, L.8.1, L.9.1, L.9.5, L.9.6, L.10, L.12.2, L.13.2, L.13.4, L.14.1, and L.15.3).

Finally, types that are found only in Tell el-Dab'a include jugs: with piriform body, kettle rim, double handle, ring base, and decoration of rectangles on the body; with piriform body, kettle rim, double handle, disc or button base, and decoration of standing and pendant triangles and/or zig-zag pattern, found also in the two previous periods; with piriform body, rolled rim, strap handle, disc base, and incised grooves on shoulder and body and base; with piriform body, rolled rim, double handle, button or disc or ring base, and decoration of filled lozenges on the body; with small piriform body, rolled rim, double handle, button base, and decoration of standing and pendant triangles and zig-zag pattern, found also in the Early Second Intermediate Period; with biconical to piriform body, rolled rim, strap handle, ring base, and decoration of standing and pendant triangles and sometimes horizontal filled band on the body; with large piriform to rounded body, rolled rim, strap handle, ring base, and decoration of filled lozenges on the body; with slender piriform to biconical body, rolled rim, strap handle, ring base, and decoration of filled rounded rectangles on the body; with small piriform to spherical body, rolled rim, strap handle, button base, and decoration of filled lozenges on the body; with small piriform to spherical body, strap handle, ring base, and decoration of standing and pendant triangles on the body; with ovoid body, ledged rim, round handle, ring base, and decoration of standing and pendant triangles on the body; with biconical body, rolled rim, strap handle, ring or disc or button base, and decoration of pendant and standing triangles on the body; with biconical body also carinated, rolled rim, strap handle, disc or ring base, decoration of standing triangle or lozenges on the body; with biconical body, rolled and with swollen neck or everted rim, strap handle, ring or button base, and decoration of pendant and standing triangles on the body, found also in the Early Second Intermediate Period; with biconical body, rolled rim with swollen neck, strap handle, ring or button base, and decoration of bands of chevrons on the body; with biconical body, rolled rim, strap handle, button base, and decoration of bands of chevrons or wavy lines on the body; with biconical body, rolled rim, round handle, round base, and decoration of bands of dots on the body; with large biconical body, rolled rim, strap handle, ring base, and decoration of bands of chevrons or diagonal lines and herringbone pattern or pendant and standing triangles; with large biconical body, rolled rim, strap handle, round base, and decoration of bands of chevrons and diagonal lines; with globular body, round base, and decoration of circles with chevrons on the body; handmade with globular body, spouted rim, double handle,

round base, and decoration of standing triangles and zig-zag pattern on the body; handmade with globular body, upright rim, double handle, round base, and decoration of standing and/or pendant triangles and/or zig-zag pattern on the body, found also in the Early Second Intermediate Period; handmade with globular body, everted rim, strap handle, round base, and decoration of horizontal and oblique lines on the body; with cylindrical body, rolled rim, strap handle, ring base, and decoration of chevrons or herringbone pattern on the body; with cylindrical body, rolled or everted rim, strap handle, rounded base, and decoration of standing and pendant triangles on the body, found also in the Late Middle Kingdom; with squat piriform body, rolled rim, double handle, ring base, and decoration of rishi pattern on the neck; duck-shaped, with single or double handle, found also in the Late Middle Kingdom; hawk-shaped, with strap handle, found also in the Late Middle Kingdom; probably cow-shaped (types F.4, I.3.2, I.5.3, I.6.3, L.1.6, L.2.1, L.2.2, L.2.3, L.2.4, L.2.5, L.3, L.4, L.5.1, L.5.2, L.5.4, L.5.5, L.6, L.7, L.8.2, L.9.3, L.11, L.12.1, L.13.1, L.14.2, L.14.4, L.15.1, L.15.2, L.15.5, M.1, M.2, N.1, N.4, N.6, N.9).

The specimens of this period from Tell el-Dab'a include also open vessels: cups with ridged rim and S-profile and decoration of filled dots, found also in the Early Second Intermediate Period; cups with modelled rim and ring base, and decoration of spirals and zig-zag pattern, found also in the previous two periods; cups and beakers with S-profile and direct rim, and decoration of lotus flowers; dishes with modelled rim, two to four handles, and ring base (types O, P.1.2, P.2, P.4, and P5).

The fabric used to produce the Tell el-Yahudiyah ware during the Late Second Intermediate Period is almost exclusively Egyptian, with few instances of Levantine fabrics in Tell el-Dab'a⁶⁶ and Tell el-Yahudiyah.⁶⁷

The first one-mode graph

The network elaborated for the Tell el-Yahudiyah ware during the Late Second Intermediate Period (Figures 87–90) demonstrates the central role of Tell el-Dab'a and Tell el-Yahudiyah in the network, because all the other sites are connected to them more than they are connected among themselves. The links shared by Harageh, Rifeh, and Abydos could show through which areas the communications between Lower and southern Upper Egypt were passing by. Nevertheless, the network appears to rely mostly on sites in Lower and Middle Egypt.

66 Aston and Bietak 2012, 137 and 529–30; Bietak, Mlinar, and Schwab 1991, 152 and 163–64.

67 Aston and Bietak 2012, 265; Griffith 1890, 39–40; Kaplan 1980, fig. 7c; Petrie and Duncan 1906, 11.

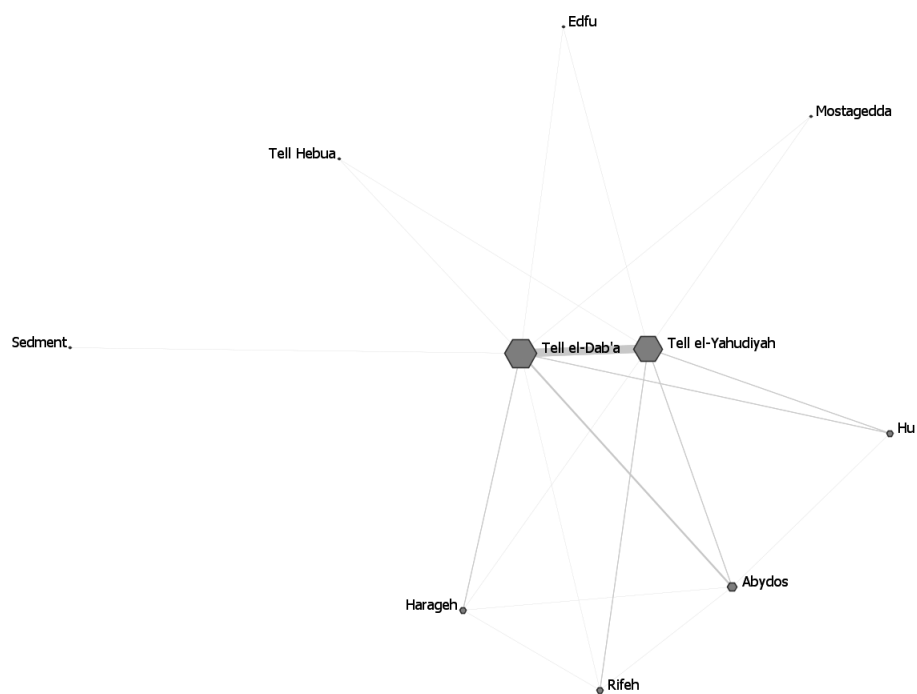


Figure 87: Degree centrality of the first one-mode graph of the Tell el-Yahudiyah ware during the LSIP.

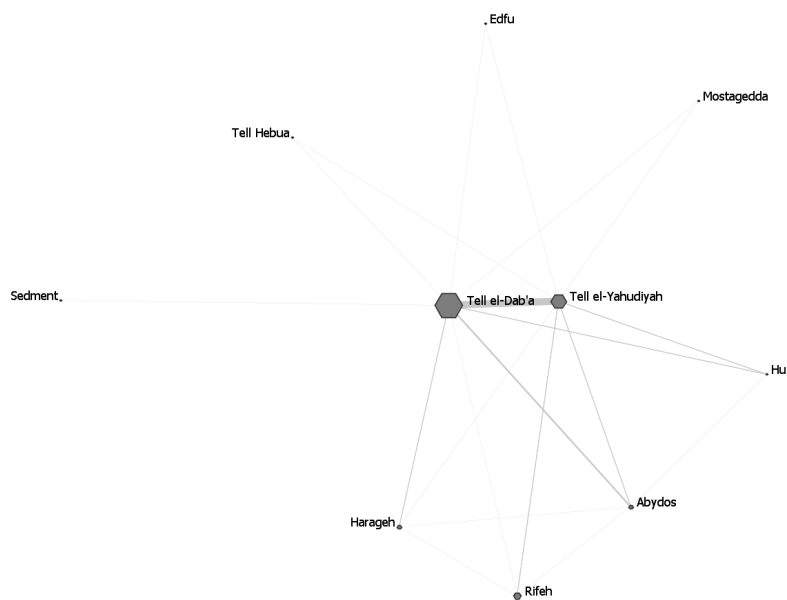


Figure 88: Betweenness centrality of the first one-mode graph of the Tell el-Yahudiyah ware during the LSIP.

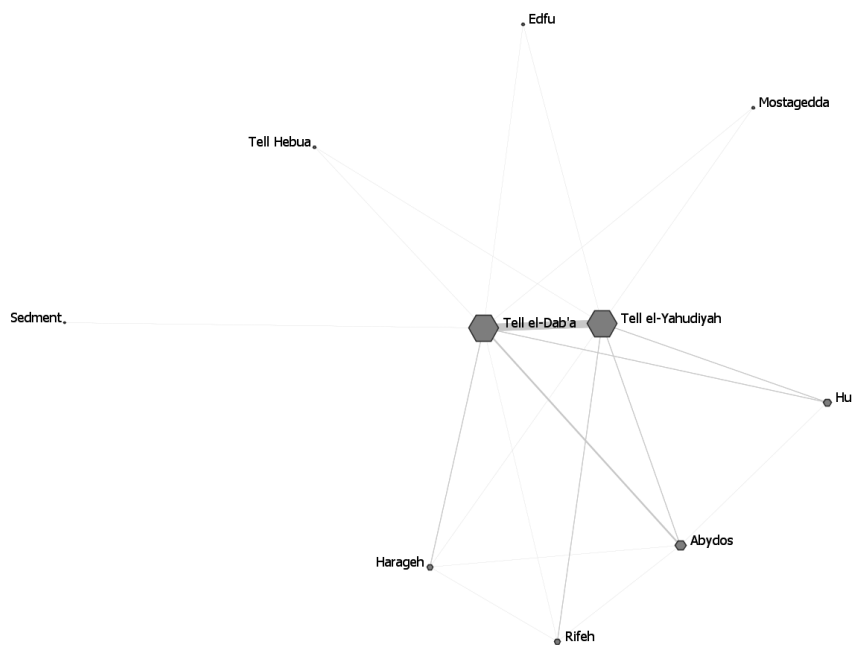


Figure 89: Eigenvector centrality of the first one-mode graph of the Tell el-Yahudiyah ware during the LSIP.

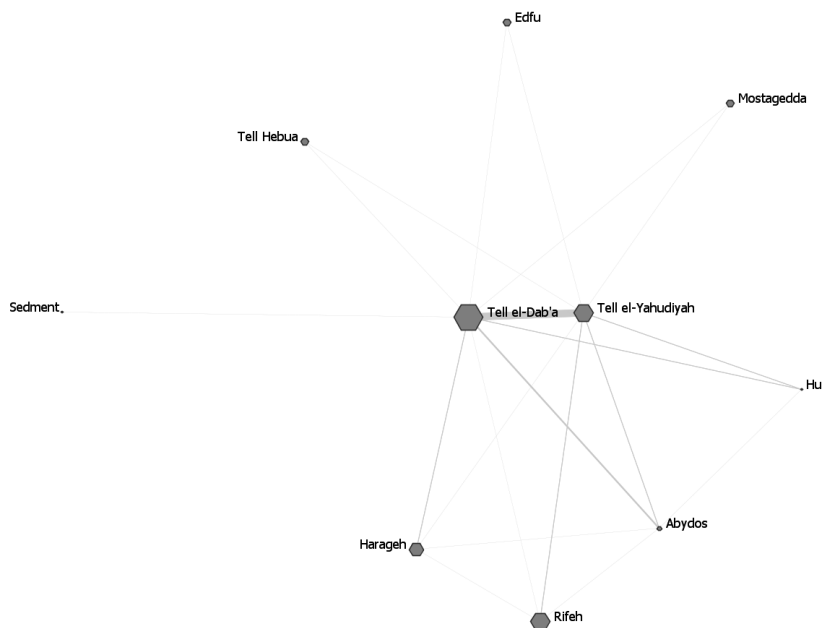


Figure 90: Closeness centrality of the first one-mode graph of the Tell el-Yahudiyah ware during the LSIP.

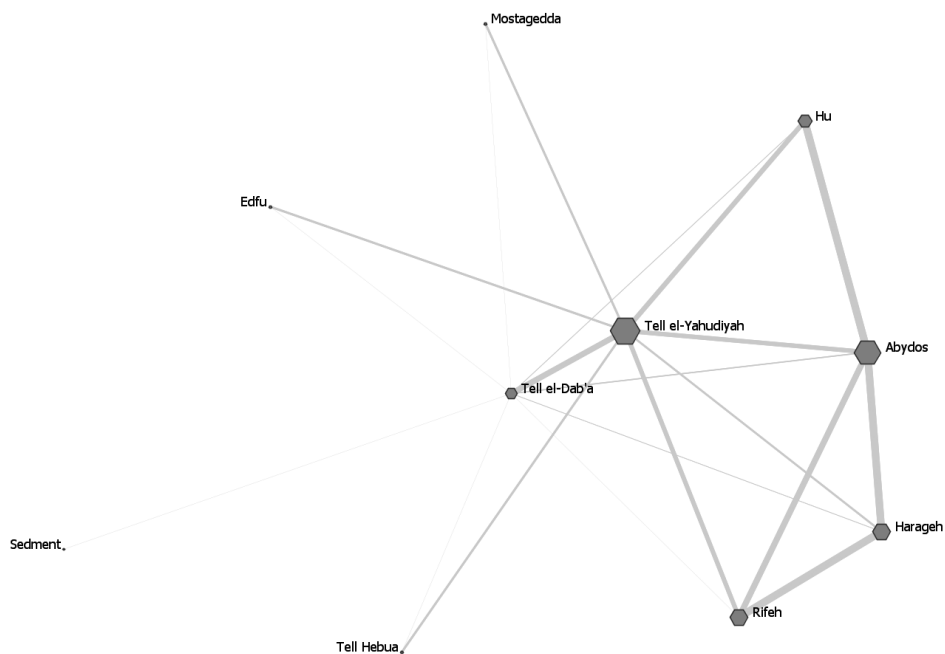


Figure 91: Degree centrality of the second one-mode graph of the Tell el-Yahudiyah ware during the LSIP.

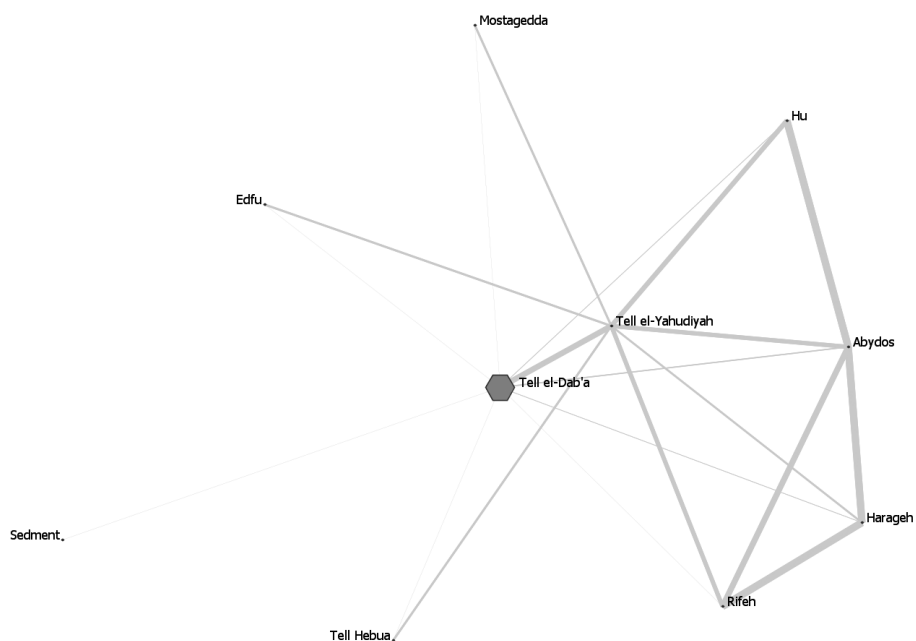


Figure 92: Betweenness centrality of the second one-mode graph of the Tell el-Yahudiyah ware during the LSIP.

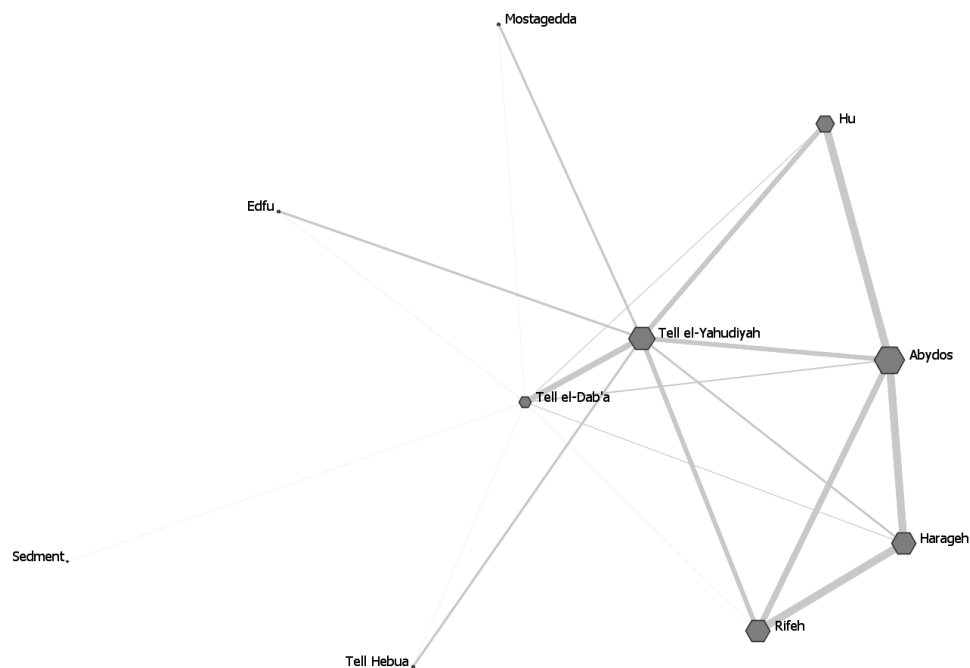


Figure 93: Eigenvector centrality of the second one-mode graph of the Tell el-Yahudiyah ware during the LSIP.

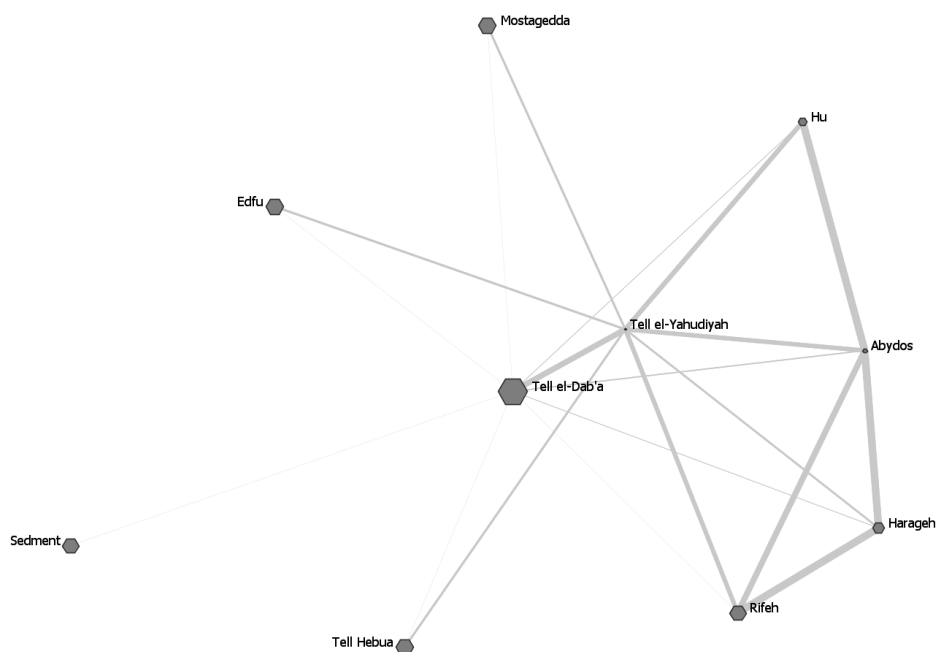


Figure 94: Closeness centrality of the second one-mode graph of the Tell el-Yahudiyah ware during the LSIP.

The centrality measures (Tables 35, 48, 61, 74 in Appendix II) indicate that Tell el-Dab'a and Tell el-Yahudiyah were the main players in the network, because they score in the high or very high ranks for all the measures, apart from the middle rank of the betweenness centrality of Tell el-Yahudiyah.

The remaining sites, namely Harageh, Sedment, Rifeh, Mostagedda, Abydos, Hu, Edfu, Tell Hebua, score all in the low or very low ranks, with the exception of the closeness centrality of Harageh and Rifeh, which is respectively in the high and in the middle rank. This means that though these two sites, like the other sites, have no strong connections in the network, were more easily accessible than the others.

The one-mode graph based on the Jaccard similarity

The network built through the Jaccard algorithm (Figures 91–94) has, again, the same structure as the first one-mode graph. The centrality measures (Tables 87, 100, 113, 126 in Appendix III) suggest, like in the previous graph, a major role for Tell el-Yahudiyah, which scores in the very high rank for the degree and eigenvector centrality.

Among the better-connected sites, namely sites with many connections of good quality, are also Harageh, Rifeh, Abydos, and Hu, which score between the middle, only for Hu, high, and very high ranks for the degree and the eigenvector centrality. Hence, their importance is increased when the full range of types is examined. This situation derives from the fact that, while these sites have part of their range of Tell el-Yahudiyah ware types in common with the other sites, this does not include the most widespread types. Therefore, these sites look less important when only the shared types are considered.

This is also the reason why Sedment, Mostagedda, Edfu, and Tell Hebua seem slightly more important in the second one-mode graph: even though they scores are mostly in the low and very low ranks, their closeness centrality is between the middle and the high ranks, implying that they were easily accessible in the network of the Tell el-Yahudiyah ware.

Finally, Tell el-Dab'a shows a completely different pattern from the previous graph, because now it scores in the very high rank only for the betweenness and the eigenvector centrality, thus appearing like an intermediary. This is also due to the influence that the proportion of more common and more rare types in the range of Tell el-Dab'a has in the two one-mode graphs.

Summary

During the Late Second Intermediate Period, the main players in the network based on the Tell el-Yahudiyah ware are Tell el-Yahudiyah and, when the full range of types is examined, Harageh, Rifeh, and Abydos. Therefore, these

sites were probably the starting or ending points of the lines of communication in the network, and where new trends could start.⁶⁸ Lastly, Tell el-Dab'a, while it was probably one of the better-connected sites, constantly appear as an intermediary, thus as a passageway or a (re)distribution centre. Hence, the Tell el-Yahudiyah ware could pass through or be (re)distributed from there.⁶⁹

Nubia

Tell el-Yahudiyah ware is found also in Nubia,⁷⁰ both in the Early and in the Late Second Intermediate Period. The specimens come from the sites of Kerma,⁷¹ Buhen,⁷² Aniba,⁷³ and Mirgissa.⁷⁴ Nubian sites are not included in the analysis, because the relationships with Nubia go beyond the scope of the present work. Nevertheless, Nubia is one of the main areas where Tell el-Yahudiyah ware has been found. Therefore, considering the connections created between Nubia and Egyptian sites through the types shared can give interesting insights.

Kerma is one of the main sites in southern Nubia, inhabited between the fourth millennium and the Egyptian New Kingdom. During the Egyptian Second Intermediate Period, it became the centre of a large kingdom. From this period, a palace-like structure and tombs, of both upper and lower classes, have been excavated.⁷⁵ Buhen was a small settlement, inhabited between the Egyptian Old Kingdom and New Kingdom. During the Middle Kingdom a large Egyptian fortress, with a temple of Horus, was built and occupied also during the New Kingdom.⁷⁶ From the Second Intermediate Period, tombs have been excavated at the site.⁷⁷ Mirgissa was inhabited from the fourth millennium B.C. but is known for the Egyptian fort built during the Middle Kingdom.⁷⁸ From the Second Intermediate Period, tombs have been excavated at the site.⁷⁹ Aniba is known for the Egyptian fort of the Middle Kingdom. The

68 Östborn and Gerding 2015.

69 Gjesfeld 2015; Rivers, Knappett, and Evans 2013.

70 Randall-MacIver and Woolley 1911, 161–77, 201–16, 310–11 and pls. 49, 92; Reisner 1915, 77 and fig. 9; Reisner 1923, 381–88 and pls. 70.3, 76.6; Steindorff 1937, 38–40, 125–37, 167–70, 194–97, 227–29 and pls. 81.36b4, 86.45a1, 86.45b1–5.

71 Reisner 1915, 77 and fig. 9; Reisner 1923, 381–88 and pls. 70.3, 76.7.

72 Randall-MacIver and Woolley 1911, 161–77, 201–6, 310–11 and pls. 49, 92.

73 Steindorff 1937, 38–40, 125–37, 167–70, 194–97, 227–29 and pls. 81.36b4, 86.45a1, 86.45b1–5.

74 Vercoutter 1965; Vercoutter 1975, 44–49.

75 Reisner 1923.

76 Emery 1963; Randall-MacIver and Woolley 1911.

77 Randall-MacIver and Woolley 1911.

78 Vercoutter 1970.

79 Vercoutter 1975; Vercoutter 1976.

site, with settlement and cemeteries, was occupied already in the third millennium B.C. and at least until the New Kingdom, but also material dated to the Egyptian Second Intermediate Period has been found.⁸⁰

While it can be seen that the Nubian sites have types in common mostly with Tell el-Dab'a and Tell el-Yahudiyah, they also share types with sites in the Memphis-Fayyum area and in Middle Egypt, and rarely with southern Upper Egypt. These sites include Harageh, Rifeh, Mostagedda, Abydos, and Hu. Therefore, while the stronger connections are with the sites in the Eastern Delta, there are connections also with sites in the Nile Valley, but outside of the Theban region. There were connections through the Western Desert and the oases, such as Bahariya,⁸¹ but this cannot be shown through the Tell el-Yahudiyah ware yet, because the specimen found at Bahariya cannot be included in a precise subgroup.⁸² For the rest, the internal network of the Egyptian sites, thus the overall connections between the Egyptian sites and their role, do not change with the inclusion of the Nubian sites.

THE CORRESPONDENCE ANALYSIS

The scores detected in the analysis of the Tell el-Yahudiyah ware have been run also through correspondence analysis, to study the relation between the variety of types discovered at the sites and the measures calculated in both graphs in this chapter. The results (Appendix IV) for the Late Middle Kingdom and the Late Second Intermediate Period demonstrate a slight tendency of sites with higher variety of types to score higher for the degree centrality and the eigenvector centrality, while the betweenness centrality is not affected. This tendency lessens when the scores of the second one-mode graph are considered. Hence, a larger quantity of types does not necessarily imply higher scores, and the results are not unavoidably biased by the number of archaeological finds.

CONCLUDING REMARKS

During the Late Middle Kingdom, the sites of Lahun, Lisht and, possibly, Harageh appear like the sites where the Tell el-Yahudiyah ware was produced or destined to, and where new trends could be spread from. It is not surprising that the sites are mostly located in the Memphis-Fayyum area, given that was the area of the capital during the period.⁸³ Tell el-Dab'a probably belonged

80 Steindorff 1935; Steindorff 1937.

81 Agut and Moreno-García 2016, 292–94; Baud 1997; Colin 2005.

82 Aston and Bietak 2012, 54; Colin 2005, 44–46; Colin, Laisney, and Marchand 2000, 186.

83 Agut and Moreno-García 2016, 249–53; Grajetzki 2004; Quirke 2005.

to this group and was acting also like a passageway or (re)distribution centre, namely where the Tell el-Yahudiyah ware would pass by on its way to its destinations or could be (re)distributed from. Nevertheless, the circulation of this ware includes mostly sites in Lower and Egypt and the Memphis-Fayyum area.

During the Early Second Intermediate Period, the only contacts detected through the network of the Tell el-Yahudiyah ware are between Tell el-Dab'a and respectively Memphis and Abydos. Contacts between Tell el-Dab'a and Abydos, and the presence of Asiatics of middle and high ranks at the latter, are shown also from other sources, especially stelae.⁸⁴

During the Late Second Intermediate Period, Tell el-Yahudiyah and, possibly, Harageh, Rifeh, and Abydos appear to be the sites where the Tell el-Yahudiyah ware was sent to or from, and where new trends could spread from. All in all, the network seems to involve mostly sites in Lower and Middle Egypt. Tell el-Dab'a was probably also part of this group, and it was also a passageway or (re)distribution centre, thus the place where the Tell el-Yahudiyah ware would be channelled through in order to reach other sites, or where it would be (re)distributed from.

84 Discussed in: Mourad 2013.

II

CYPRIT POTTERY

This chapter examines the types of Cypriot pottery, both imports and local imitations. In Egypt, this pottery is found rarely in the Middle Kingdom and the Early Second Intermediate Period, while it became more common during the Late Second Intermediate Period, especially in its later part, and in the New Kingdom.¹ Cypriot pottery is found mostly at Tell el-Dab'a, while it is rare at other sites in Egypt.²

Tell el-Dab'a seems to have a special part in the contact with Cyprus. This has been demonstrated in previous studies on the Cypriot pottery found in Egypt,³ as well as in studies on Tell el-Yahudiyah ware. The latter have suggested that part of the Tell el-Yahudiyah ware unearthed in Tell el-Dab'a, especially the small globular handmade one, could have been made by Cypriot potters: the techniques used in fabricating the vessels, especially the handmade technique and how the handle is attached to the vessel, and the decoration techniques remind one of the techniques used in Cyprus.⁴ All in all, the sample examined for the analysis of the Cypriot pottery is small: this should be kept in mind when examining the results of the analysis. Nevertheless, Cypriot pottery is a very distinctive type, thus it is informative of contacts and common cultural traditions.

When two or more sites share similar objects, this suggests that they share cultural traits or traditions, depending of course on the quantity of objects found. Because the Cypriot pottery, both imported as well as locally imitated, forms a very distinctive type of artefact, encountering these across two or more Egyptian sites suggests that these places were part, to a greater or lesser extent, of a particular cultural tradition.⁵ However, similar types found at two

1 Aston et al. 2004, 316, 387, 392; Karageorghis 1995; Maguire 1995; Maguire 2009, 26–41; Vilain 2019.

2 Karageorghis 1995; Maguire 2009, 26–41; Vilain 2019.

3 Karageorghis 1995; Maguire 1995; Maguire 2009, 26–41; Vilain 2019.

4 Maguire 1995; Maguire 2009, 21–24.

5 Bietak 1996, 35; Maguire 1995; Maguire 2009, 21–42; Merrillees 1968, 190–202; Vilain 2019.



Drawing 5: Pottery shapes included in the Cypriot pottery. Clockwise from the top left corner: lentoid flask (side and front view), jug(let)s (one with a single handle, one with two handles), a spindle bottle (with a single handle), and a bowl. Drawings after Merrillees 1968 and after specimens on the website of the Metropolitan Museum of Arts, New York.

or more sites do not imply direct contacts between these places, but only that there were similar traditions and contacts, which could have followed a more indirect route that simply cannot be known yet.⁶ This derives from the fact that the data analysed are but a sample, namely what has been so far found and published.⁷

Cypriot ware includes mostly jugs and juglets, sometimes with two handles, as well as spindle bottles, lentoid flasks, and bowls, also with spouts;⁸ the shapes of the mentioned vessels are shown in Drawing 5. Nearly all the vessels have a slip, namely a cover of thin clay, mixed with water and applied to the surface of the vessels before the firing process.

The typology so far constructed for the Cypriot pottery, and followed in the present research,⁹ considers both the decorations of the vessels, their shapes, and their fabrics,¹⁰ grouping these features under the label of the same type. Concerning the shape, it does not show significant differences in the present

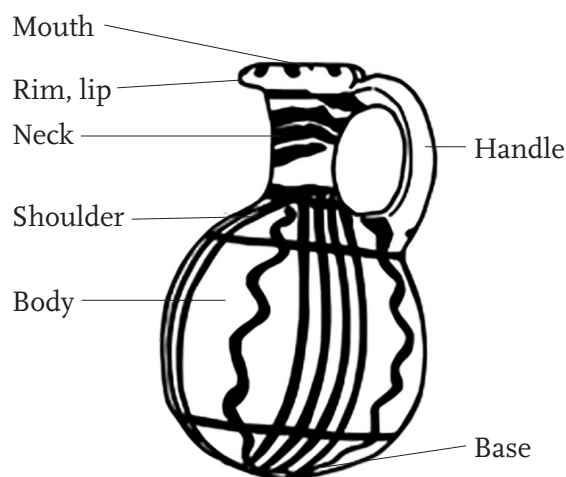
6 Brughmans 2013, 638–39; Sindbæk 2007b, 66; Sindbæk 2013, 74–76, 82.

7 Brughmans 2013; Brughmans, Isaksen, and Earl 2012; Knappett 2013; Östborn and Gerding 2014, 81–83; Peeples and Roberts Jr. 2013, 3002.

8 Åström 1972; Maguire 2009; Merrillees 1968.

9 Especially the ones used in works concerning the Cypriot pottery in Egypt: Maguire 2009; Merrillees 1968.

10 Åström 1972; Gjerstad 1926; Maguire 2009, 42–73; Merrillees 1968, 145–87.



Drawing 6: Parts of a vessel as used in the description of the Cypriot pottery.
Drawing after Vilain 2019.

analysis: outside Tell el-Dab'a, the sample is so small that it cannot be said if a particular site preferred specific shapes. Therefore, the shape and the ware of the vessels is not specified in the present analysis, but only the name of the type. Concerning the fabrics, these are not always known in detail, but the local Egyptian ones can be distinguished from the imported, Cypriot, ones.¹¹

Not only the fabrics, but also the decorations techniques can reveal whether a vessel was imported or made locally in Egypt.¹² The two groups have been separated in the present analysis, because they are found in Egypt through different mechanisms and, therefore, give different information.

The imported vessels reached Egypt either because the products that they transported¹³ were exported there,¹⁴ or because individuals, Cypriot or not, could carry them from Cyprus.¹⁵ Over time, imitations began to outnumber

¹¹ Maguire 2009, 37–38.

¹² Maguire 2009, 37–38, 86–87.

¹³ The types found in Tell el-Dab'a have parallels in several areas of Cyprus. Thus, it is possible that ships travelled all along the coast to collect cargo, or that products from different areas were channelled to the main harbours: Maguire 2009, 37, 86–87.

¹⁴ The importance of seafaring for the island is also shown by model boats found in tombs, discussed in: Merrillees 1968, 187–89.

¹⁵ Presence of Cypriot individuals in Tell el-Dab'a has been hypothesized especially in: Bietak 1996, 35; Maguire 1995, 55; Maguire 2009, 21–24, 37, 86–87.

the imported pottery. The imitations were made locally and there can be several reasons for their increased popularity, not in the least the fact that the shapes appear to have become part of local traditions. Another reason might be that the supply from Cyprus was interrupted, necessitating local craftsmen to produce these shapes for a public that had grown accustomed to them.¹⁶

The only vessel parts relevant to the present chapter, because they are where the decoration is focused, are (Drawing 6):

1. the neck, namely the part connecting the rim, which is the part around the top opening of the vessel, to the shoulder, which is the part connecting the neck to the body.
2. the body, which is the central, main part of the vessel, described like a geometric figure;
3. the base, namely the part underneath the body and in contact with the support surface.

It is not certain what these vessels contained. A longer and narrower neck would have prevented vessels from easily spilling their contents, suggesting they were used to contain liquids. Since many of these vessels were considered important enough to be used as grave gifts, it seems probable that they were used to transport, store, and/or pour valuable liquids. Chemical analyses of the organic residues left in some of these vessels have shown that they contained fatty substances – most likely, oils.¹⁷ Other analyses suggest that these Cypriot vessels were also used to contain honey, a valuable, viscous liquid.¹⁸ Lastly, chemical analyses on organic residues have also demonstrated that other vessels were used in meals, both to serve food and to drink wine.¹⁹

The decoration of Cypriot vessels of Base Ring Ware type could recall the shape of the opium poppy or, alternatively, the incision made with the knives used to collect them. As a result, it has been suggested that these vessels were also used to transport liquid opium.²⁰ However, chemical analyses of the residues found inside these vessels have shown conclusively that they do not contain any traces of the alkaloids that one would expect if they had once contained opium.²¹

16 Maguire 2009, 38.

17 Eriksson 1993, 143–44; Karageorghis 1995; Knappett et al. 2005; Maguire 1995, 55; Merrillees 1968, 170–74; Steele 2008, 34–39 and 349–55; Steele, Stern, and Knappett 2007.

18 Karageorghis 1995, 74–75.

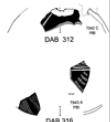
19 Beck et al. 2004.

20 Merrillees 1968, 176–79.

21 Chovanec, Bunimovitz, and Lederman 2015; Koschel 1996.

<i>Type</i>	<i>Description</i>	<i>Outline</i>
WPPLS	White Painted Pendant Line Style includes hand-made vessels in reddish or brownish clay, covered in a white-to-buff, or sometimes orange or brown, slip. These vessels are further decorated on the body with vertical narrow lines, which alternate groups of straight and wavy lines, painted in red, brown, or black. Sometimes, broad horizontal straight lines are painted on the neck.	
WPCLS	White Painted Cross Line Style includes hand-made vessels in reddish or brownish clay, covered in a white-to-buff, or sometimes orange or brown, slip. These vessels are further decorated on the body with patterns of intersecting narrow lines, painted in red, brown, or black. Sometimes, broad horizontal straight lines are painted on the neck.	
WPBBWL	White Painted with Broad Bands and Wavy Lines includes hand-made vessels in reddish or brownish clay, covered in a white-to-buff, or sometimes orange or brown, slip. These vessels are further decorated on the body with patterns of wavy and broad straight lines, painted in red, brown, or black.	
WPV	White Painted V includes hand-made vessels in reddish or brownish clay, covered in a white-to-buff, or sometimes orange or brown, slip. These vessels are further decorated on the body with zig-zag patterns of oblique narrow lines, painted in red, brown, or black. Sometimes, broad horizontal straight lines are painted on the neck.	
WPBBS	White Painted Broad Band Style includes hand-made vessels in reddish or brownish clay, covered in a white-to-buff, or sometimes orange or brown, slip. These vessels are further decorated on the body with patterns of vertical and oblique broad lines, painted in red, brown, or black. Sometimes, broad horizontal straight lines are painted on the neck.	
WPTLS	White Painted Tangent Line Style includes hand-made vessels in reddish or brownish clay, covered in a white-to-buff, or sometimes orange or brown, slip. These vessels are further decorated on the body with patterns of touching vertical and oblique lines, painted in red, brown, or black. Sometimes, broad horizontal straight lines are painted on the neck.	

(continued)

<i>Type</i>	<i>Description</i>	<i>Outline</i>
WPWLS	White Painted Wavy Line Style includes hand-made vessels in reddish or brownish clay, covered in a white-to-buff, or sometimes orange or brown, slip. These vessels are further decorated on the body with patterns of horizontal straight and wavy lines, painted in red, brown, or black.	
WPVI	White Painted VI includes hand-made vessels in reddish or brownish clay, covered in a white-to-buff, or sometimes orange or brown, slip. These vessels are further decorated on the body with two bands of vertical and oblique narrow lines, painted in red, brown, or black; the two bands are separated by a horizontal line. Sometimes, broad horizontal straight lines are painted on the neck.	
RoB	Red on Black ware includes hand-made vessels in reddish or brownish clay, covered in a dark brown, or black slip and carrying a red-to-lilac painted decoration.	
B/RSW	Black/Red Slip Ware includes both handmade and wheel-made vessels in brownish clay, covered in a black or red, or sometimes combined, slip.	
PWHW	Plain White Handmade Ware includes both handmade and wheel-made vessels, in brownish clay and covered in a white slip, with bands of incised reliefs.	
WPW	White Painted Wheelmade ware includes wheel-made vessels like the ones of the handmade White Painted groups. Therefore, they are in reddish or brownish clay and are covered in a white-to-buff, or sometimes orange or brown, slip. These vessels are further decorated with lines painted in red, brown, or black.	
CBW	Cypriot Bichrome Ware includes both handmade and wheel-made vessels in brownish clay, with red, black, or brown painted decoration	

(continued)

Type	Description	Outline
PWSW	Proto White Slip Ware includes vessels both hand-made and wheel-made vessels in a coarse brownish clay, covered by a thick white or light-buff slip with red, black, or brown painted decoration.	
BRW	Base Ring Ware includes handmade vessels in thin and metallic fabric of black, grey, brown, or red-orange colour. They feature a ring-shaped base, as well as decorations in relief or painted.	
RLWW	Red Lustrous Wheelmade Ware includes wheel-made vessels in a fine red fabric. The surface of these vessels is self-slipped, in other word it has a slip made of the same clay used for the vessels, and burnished, namely it has been rubbed and smoothed with a stone before the firing process.	

Table 5: Description and outline of the main types of Cypriot pottery.
Drawings after Merrillees 1968 and Maguire 2009.

Lastly, while a typology for Cypriot pottery has been established,²² there are still points of debate. The main problem is that, though the types are considered to follow chronologically, this chronological development has been based on specific cemeteries,²³ on a sample whose size has not been specified,²⁴ and supporting it can become problematic when data are added from other excavations: newly unearthed material may suggest a different development.²⁵ The second main problem is that the division of types becomes problematic when data from different areas of Cyprus are compared:²⁶ division that can be valid for a specific area cannot be supported on the basis of material found in another area.²⁷ Moreover, regional stylistic differences in the pottery produced in Cyprus have also been detected.²⁸ Nevertheless, there are still points of debate on which stylistic regions can be recognized.²⁹ The problem that has been recently recognized in the classification of Cypriot pottery is that the typology elaborated does not take into account variability, namely the complete

22 Åström 1972; Gjerstad 1926; Merrillees 1978.

23 Especially in Gjerstad 1926.

24 Maguire 2009, 70–71.

25 Maguire 2009, 70–72.

26 Maguire 2009, 73–74.

27 See for example the typologies elaborated in: Åström 1972; Gjerstad 1926.

28 Mostly between the northern and the eastern part: Maguire 2009, 73–74.

29 For example, while Frankel recognizes a series of overlapping regions, Åström and Merrillees suggest an east/west dichotomy: Åström 1972; Frankel 1974; Merrillees 1971.

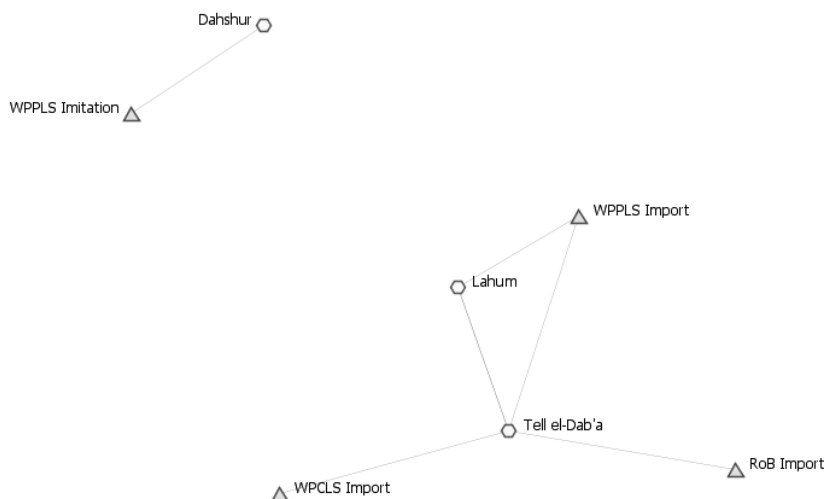


Figure 95: Contexts of the Late Middle Kingdom and their Cyprriot pottery.

range of features and attributes of pottery, and how they can vary on a regional, local, or even individual (i.e. the specific potters producing the vessels) scale.³⁰ Because of the points of debate, despite the fact that Cyprriot pottery has been used as a tool for absolute and relative dating, especially for Cyprus and the Aegean,³¹ in the present work only specimens from dated contexts are included, and no attempt at dating through specimens of Cyprriot pottery has been made. This choice derives also from the fact that the data reported in the published material used for the present work are often not accurate enough for using the Cyprriot pottery for dating purposes.

THE LATE MIDDLE KINGDOM

During the Late Middle Kingdom (Table 11 in Appendix I; Appendix VI), imported or imitated Cyprriot pottery comes nearly exclusively from Tell el-Dab'a.³² The types found include, as visible in Figure 95, imported types of White Painted Pendant Line Style and White Painted Cross Line Style, as well as imported Red on Black ware. The specimens come from funerary and settlement contexts. Further, two specimens of White Painted Pendant Line Style have been retrieved from the Memphis-Fayyum area, namely one

30 As suggested in: Baird 1991; Maguire 1995, 54; Maguire 2009, 74–75.

31 Åström 2001; Bietak 2003b; Bietak and Hein 2001; Merrillees 2002.

32 Maguire 2009, 97, 103–7, 155; Schiestl 2009, 237.

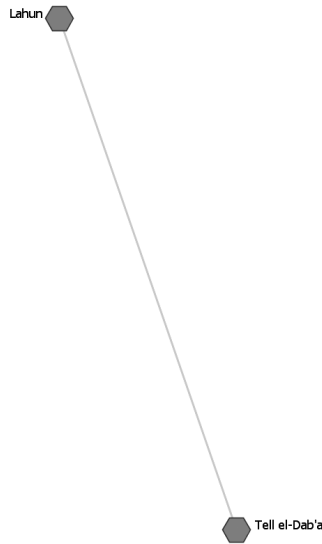


Figure 96: First one-mode graph of the Cypriot pottery during the LMK.

imported from a settlement context at Lahun,³³ and an imitation in a funerary context in Dahshur.³⁴ Imported Cypriot pottery is more common than its imitations, which are rare in the Late Middle Kingdom.

Connections in the Late Middle Kingdom

For the Late Middle Kingdom (Figure 96), only Lahun shares the only type found there, namely a White Painted Pendant Line Style, with Tell el-Dab'a. Therefore, only Tell el-Dab'a and Lahun are connected through Cypriot pottery. Considering also that most of the available specimens of Cypriot pottery have been retrieved in Tell el-Dab'a, this latter seems to be the main player in the relations with Cyprus.³⁵ Cypriot pottery reached also Lahun and Dahshur, hence the area of the capital.³⁶ Nevertheless, the sample analysed is very small. Therefore, it is possible that there were more contacts, between the mentioned sites or even between more sites, but these cannot be detected at present.

33 Gallorini 2011; Kemp, Merrillees, and Edel 1980, 98; Maguire 2009, 173; Merrillees 1968, 42; Merrillees 2002, 3–4; Petrie et al. 1891, pl. I.

34 Merrillees 2002, 4–5.

35 Close contacts between Tell el-Dab'a and Cyprus as visible through the pottery are also discussed in: Forstner-Müller and Kopetzky 2009; Maguire 1995; Maguire 2009, 21–41 and 86–87.

36 Agut and Moreno-García 2016, 249–53; Quirke 2005.

THE EARLY SECOND INTERMEDIATE PERIOD

During the Early Second Intermediate Period (Table 17 in Appendix I; Appendix VII), both imports and imitations of Cypriot pottery have been unearthed only at Tell el-Dab'a.³⁷ The types include imported types of White Painted, namely the one with Broad Bands and Wavy Lines, the Cross Line Style, and the Painted Pendant Line Style, as well as imitations of the latter. In general, imported Cypriot pottery is more common than its imitations, which are still rarely found. Lastly, all the specimens come from settlement contexts.

THE LATE SECOND INTERMEDIATE PERIOD

For the Late Second Intermediate Period (Table 23 in Appendix I; Appendix VII), half of the vessels belonging to imports or imitations of Cypriot pottery comes from Tell el-Dab'a,³⁸ for the major part from settlement areas and rarely from tombs. Both imports and imitations of Cypriot pottery have been further retrieved from tombs in Sedment,³⁹ as well as in settlement contexts in Tell el-Maskhuta⁴⁰ and Tell Hebua.⁴¹ Other imported specimens of Cypriot pottery come also from tombs in Abydos,⁴² Dishasha⁴³ and Rifeh,⁴⁴ as well as from settlement contexts in Memphis.⁴⁵ Moreover, imitations of Cypriot pottery have been excavated in tombs in Abusir el-Meleq⁴⁶ and Tarkhan,⁴⁷ and in settlement contexts in Ain Asil⁴⁸ and Kom el-Khilgan.⁴⁹ All in all, few specimens are found at each site outside of Tell el-Dab'a, more often in settlement than in burial contexts.

37 Bietak et al. 2013; Maguire 1995; Maguire 2009, 93–112 and 225.

38 Aston, Bader, and Kunst 2009, 64–67; Bietak 1968, pl. XXXI; Bietak 1981, pl. XXX-III; Bietak and Hein 1994, 247–48; Bietak and Hein 2001, 182, figs. 2 and 9; Bietak, Mlinar, and Schwab 1991, 312, figs. 144–45, 238, 268, 270, 288; Fuscaldo 1998; Hein, Jánosi, and Kopetzky 2004, 36–81 and 120–68, figs. 4–56 and 92–137, pl. XXXVII–XXXIX; Maguire 2009, 93–170 and 226.

39 Maguire 2009, 173; Merrillees 1968, 72–73; Petrie and Brunton 1924, 20 and pls. XLV.65, XLV.69–70, XLVI.

40 Redmount 1989, 893–95; Redmount 1995a, 185.

41 Maksoud 1998, 202–6.

42 Garstang, Newberry, and Milte 1901; Merrillees 1968, 95–97 and 114; Peet 1914, 54–69 and pl. XXIX.

43 Merrillees 1968, 77; Petrie and Griffith 1898, 34, pls. I.4 and XXXIII.25.

44 Merrillees 1968, 90; Petrie, Thompson, and Crum 1907, 26 and pl. XXVIII.315.

45 Bourriau 1987b; Bourriau 1991b; Bourriau 1992.

46 Merrillees 1968, 37; Möller and Scharff 1926, 90, pls. 70 and 76.

47 Maguire 2009, 173; Merrillees 1968, 29–31; Petrie 1914, pls. IX.22–23 and 25.

48 Marchand, Soukiasian, and Bourriau 2010, 145 and 233.

49 Pantalacci 2005; Pantalacci and Denoix 2006; Vilain 2019.



Figure 97: Contexts of the Late Second Intermediate Period and the most common types of Cypriot pottery.

Figure 97 shows the types most common during the Late Second Intermediate Period are both imports and imitations of types of White Painted, namely the Cross Line Style, the Pendant Line Style, which are both found also in Late Middle Kingdom and in the Early Second Intermediate Period, and the VI. Other types retrieved for the Late Second Intermediate Period include imported Black/Red Slip Ware, imported Base Ring Ware, imported Cypriot Bichrome Ware, imported Plain White Handmade Ware, imported Proto White Slip Ware, imported Red Lustrous Wheelmade Ware, imported groups of White Painted V (which is also found in the Late Middle Kingdom), namely Broad Band Style, Tangent Line Style, and Wavy Line Style, as well as imported White Painted Wheelmade, imported Red on Black ware, and imported White Painted with Broad Bands and Wavy Lines ware. The last two types are also respectively found in the Late Middle Kingdom and in the Early Second Intermediate Period.

The first one-mode graph

During the Late Second Intermediate Period, the first one-mode graph (Figures 98–101) shows that the structure of the network of imports and imitations of Cypriot pottery is centred on Tell el-Dab'a, followed by sites in the Delta and in the Sinai, namely Tell el-Maskhuta and Tell Hebua. The sites in the Delta are in contact mostly with the sites in the Memphis-Fayyum area, especially Sedment, as well as with Ain Asil and with Abydos.

The analysis of the centrality measures (Tables 36, 49, 62, 75 in Appendix II) shows that Tell el-Dab'a, which scores very high for all of them, and Tell el-Maskhuta, which scores very high for all the measures but for the betweenness centrality, were the better-connected sites, namely the sites with the higher number of connections of good quality, and the main players in the network. Sedment and Tell Hebua score in the middle rank for the degree and the eigenvector centrality, and in the high rank for the closeness centrality. This means that these sites could be well connected and have some importance in the network of the Cypriot pottery. At the same time, Abydos scores in the very high rank for the betweenness centrality and the closeness centrality, which suggests its role as intermediary in the network of the Cypriot pottery.

The remaining sites, namely Kom el-Khilgan, Tarkhan, Rifeh, Ain Asil, Abusir el-Meleq, Memphis, and Dishasha, score in the low or very low ranks. This means that all these sites did not create any strong connections in the network of the Cypriot pottery. In this group, only Abusir el-Meleq, Memphis, and Dishasha are in the middle rank for the closeness centrality, implying that they could be reached easier than other sites through the paths created by the connections in the network of the Cypriot pottery.

The one-mode graph based on the Jaccard similarity

The structure of the second one-mode graph (Figures 102–105) is like the one of the previous graph. This shows that it does not change if the full range of Cypriot pottery or only the shared types are considered. As far as the measures (Tables 88, 101, 114, 127 in Appendix III) are concerned, only Rifeh has the same pattern as in the previous graph, namely all low values. Other sites, including Kom el-Khilgan, Abusir el-Meleq, Dishasha, and Ain Asil, look slightly more important when the full range of Cypriot pottery is concerned, because they score in the middle rank for the degree centrality and/or for the eigenvector centrality. At the same time, Tell Hebua, Sedment, and Tarkhan seem much more important than in the previous network, because they score in the high or very high rank for the degree and the eigenvector centrality.

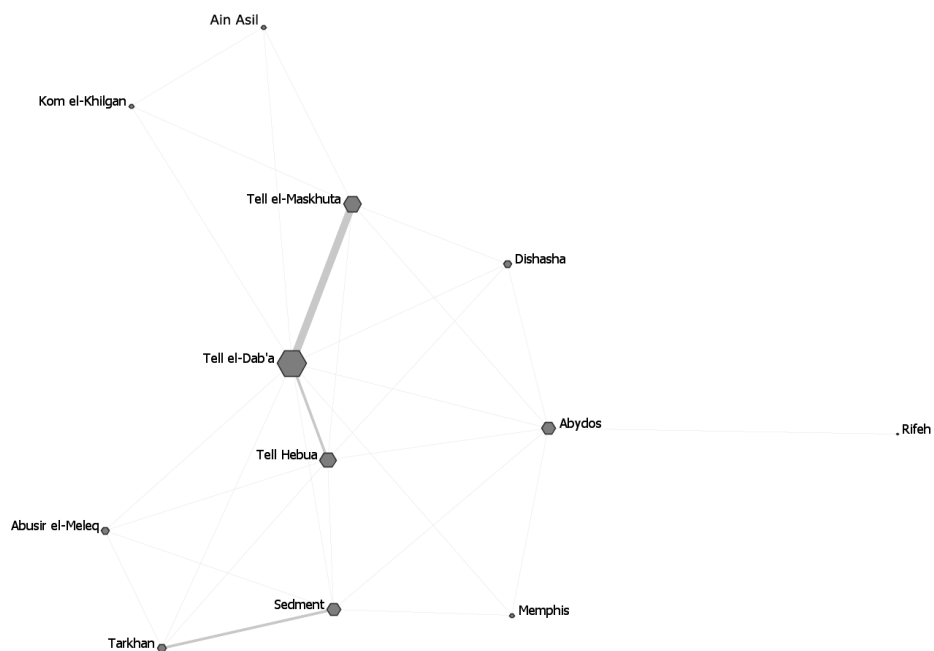


Figure 98: Degree centrality of the first one-mode graph of the Cypriot pottery during the LSIP.

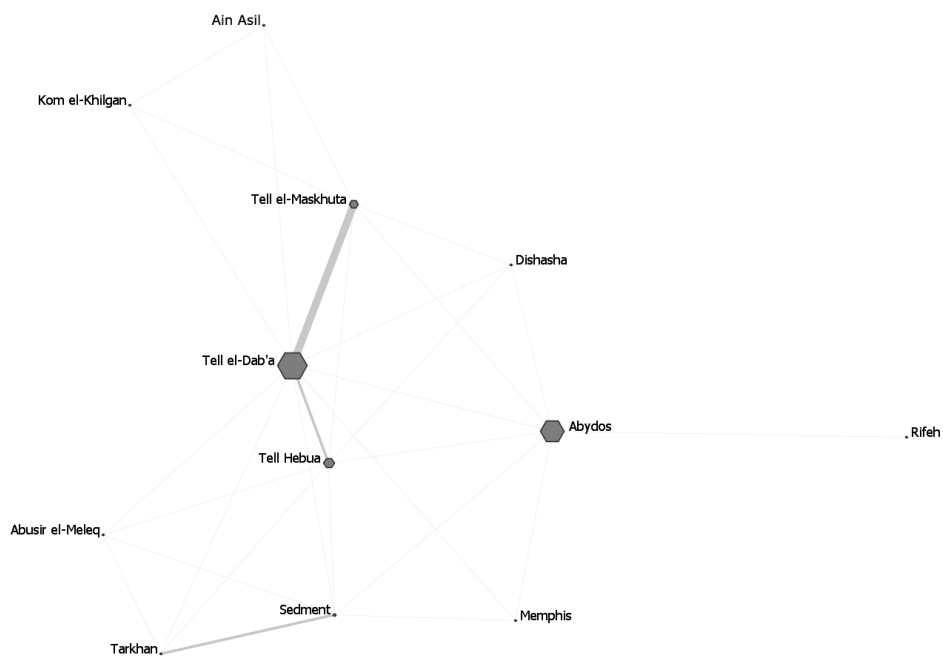


Figure 99: Betweenness centrality of the first one-mode graph of the Cypriot pottery during the LSIP.

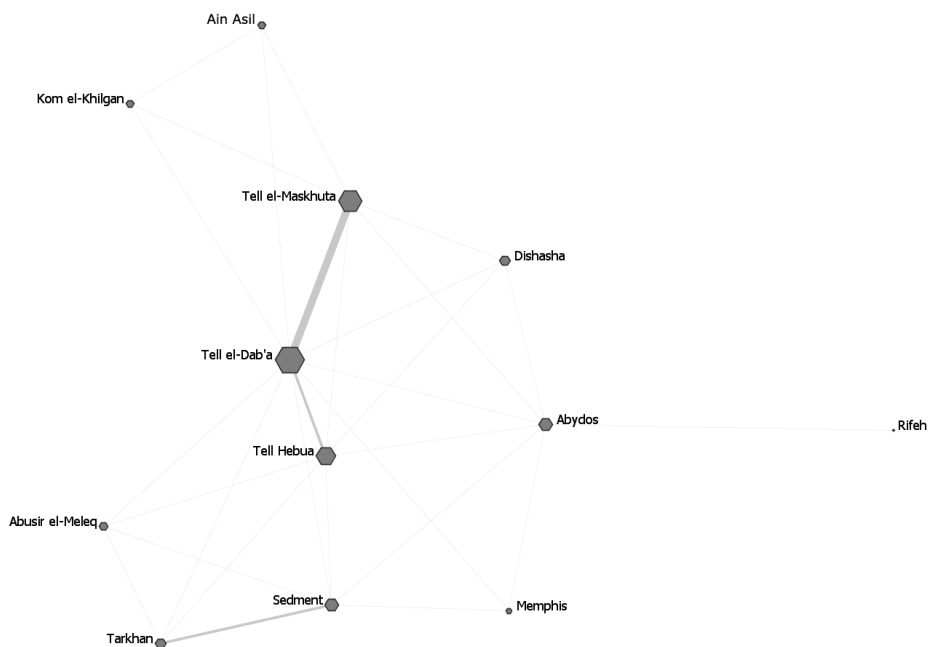


Figure 100: Eigenvector centrality of the first one-mode graph of the Cypriot pottery during the LSIP.

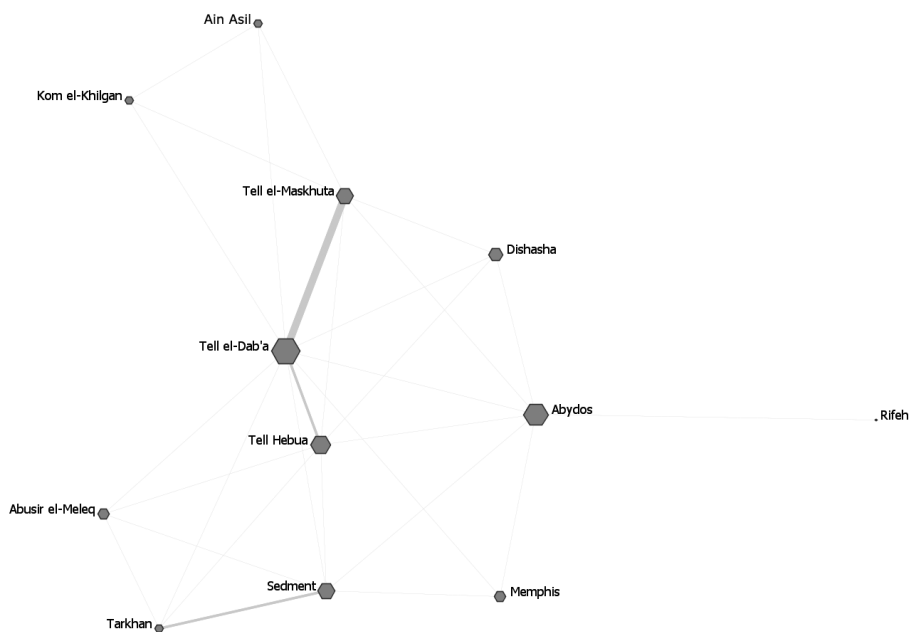


Figure 101: Closeness centrality of the first one-mode graph of the Cypriot pottery during the LSIP.

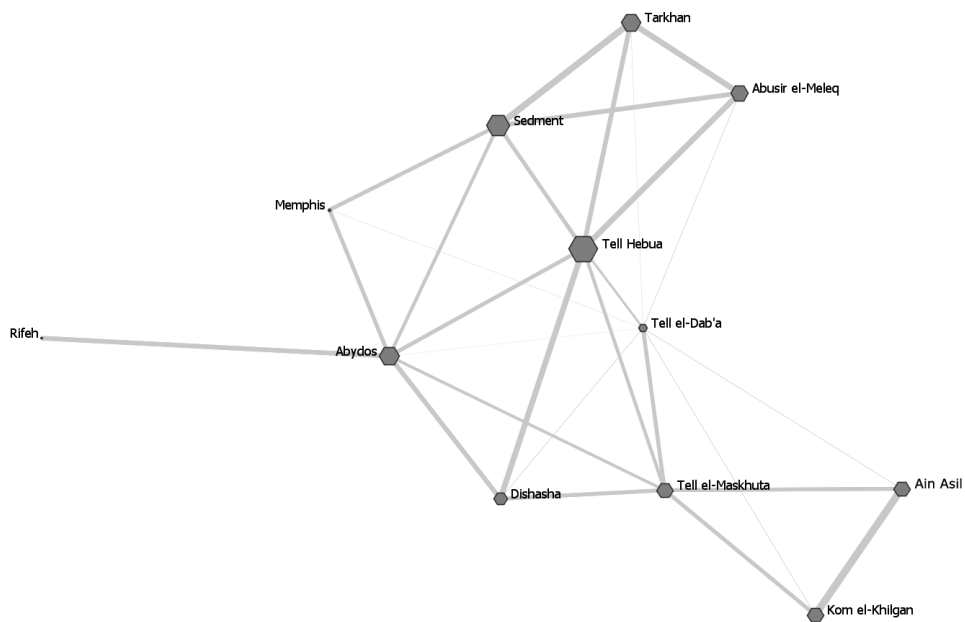


Figure 102: Degree centrality of the second one-mode graph of the Cypriot pottery during the LSIP.

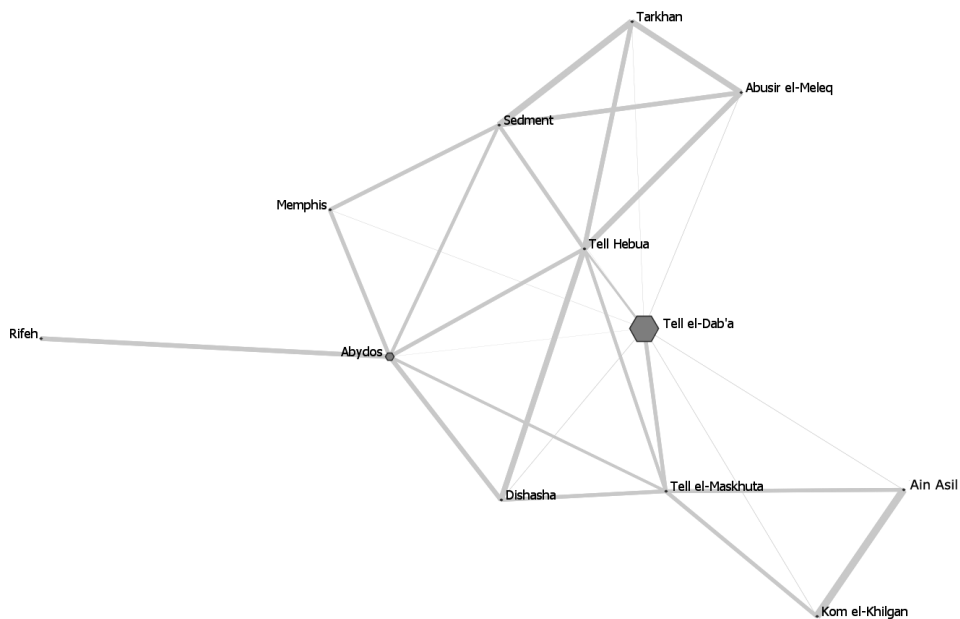


Figure 103: Betweenness centrality of the second one-mode graph of the Cypriot pottery during the LSIP.

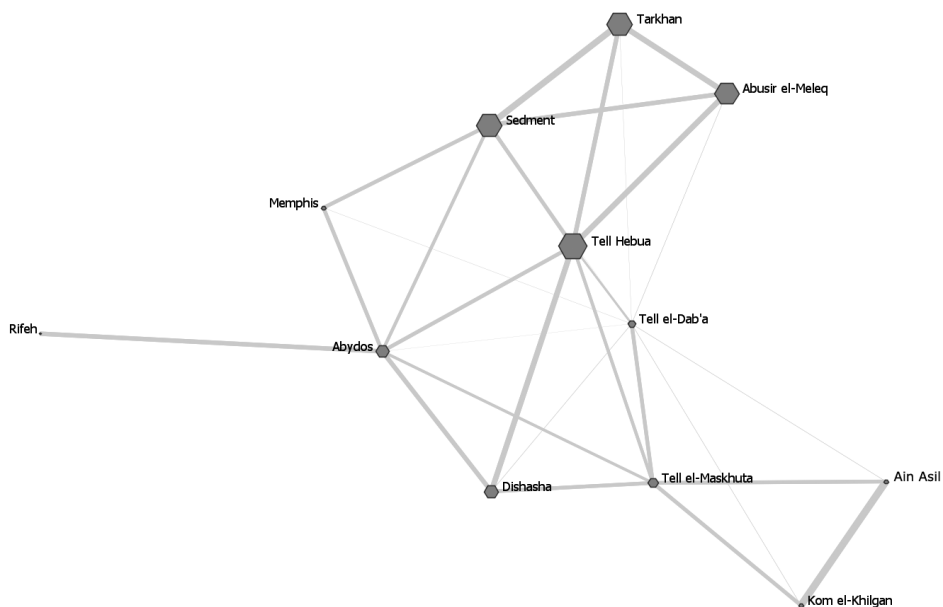


Figure 104: Eigenvector centrality of the second one-mode graph of the Cypriot pottery during the LSIP.

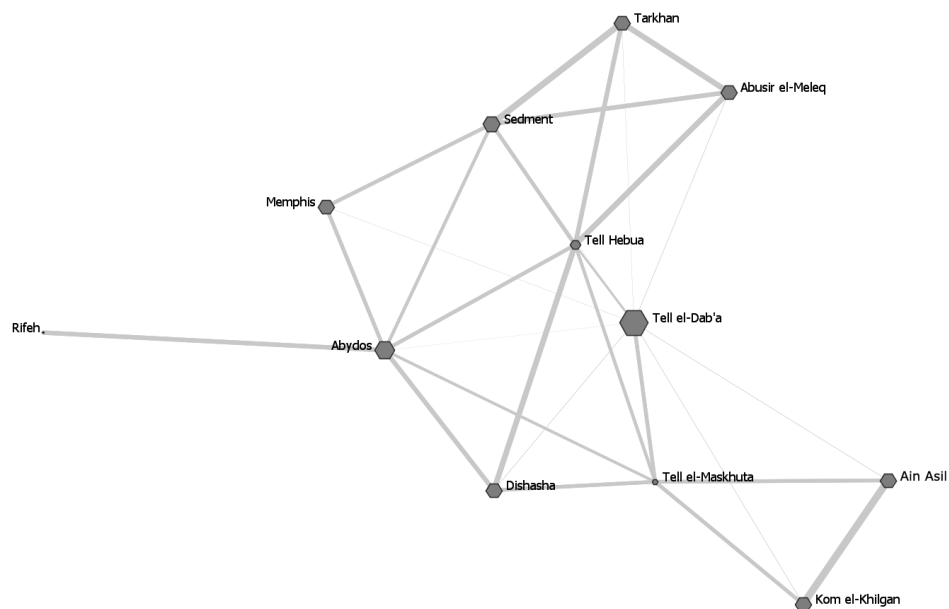


Figure 105: Closeness centrality of the second one-mode graph of the Cypriot pottery during the LSIP.

All the aforementioned differences derive from the fact that these sites have part of their types of Cypriot pottery in common with the other sites, but not the most widespread ones, so that their importance is decreased when only the shared types are considered. On the contrary, Tell el-Maskhuta and Memphis score mostly in the lower ranks, thus appearing less important when their full range of Cypriot pottery is considered. This derives from the fact that these sites do not share a large part of their range, but this part includes mostly common types, so that the sites acquire more importance when only the types that they have in common are considered.

Finally Tell el-Dab'a and Abydos score a completely different pattern from the previous graph. While Tell el-Dab'a scores very high for the betweenness centrality and the closeness centrality, which imply a role of intermediary in the network of the Cypriot pottery, Abydos scores high for the degree centrality and the closeness centrality. The difference is due to the proportion of common and no-common types included in the range of these sites.

Summary

During the Late Second Intermediate Period, Tell el-Dab'a, Tell el-Maskhuta, Sedment, and Tarkhan were probably among the better-connected sites in the network based on the Cypriot pottery, hence the probable starting or ending points of the lines of communication in the network, and where new trends could start.⁵⁰ When the full range of types is considered, also Abydos appears among the better-connected sites. Tell el-Dab'a appears as an intermediary as well, thus as passageways or (re)distribution centres. Therefore, the Cypriot pottery was passing through or was (re)distributed from these sites.⁵¹ Abydos also seems to play this role, when only the types that are in common are considered. However, considering the small size of the sample analysed, it should be kept in mind that more contacts, between the mentioned sites or even between more sites, cannot be ruled out, but they cannot be detected at present.

THE CORRESPONDENCE ANALYSIS

The results of the examination of the Cypriot pottery of the Late Second Intermediate Period have been analysed also through correspondence analysis, to understand if they are affected by the variety of types retrieved at the sites. The correspondence analysis (Appendix IV) confirms that the sites with higher variety of types tend to score higher for the degree centrality and the eigenvector centrality, but not for the betweenness centrality. However, this

50 Östborn and Gerding 2015.

51 Gjesfeld 2015; Rivers, Knappett, and Evans 2013.

tendency decreases when the scores of the second one-mode graph are analysed. This means that a larger quantity of types does not necessarily mean also higher scores, thus that the results are not inescapably affected by archaeological bias.

CONCLUDING REMARKS

Before the Late Second Intermediate Period, Cypriot pottery includes nearly exclusively imported vessels, and mostly from settlement contexts. Tell el-Dab'a seems to be the main, or even only Egyptian site in contact with Cyprus. Cypriot pottery of this period is found also further south into Egypt, but with only few specimens during the Late Middle Kingdom and still not further than the area of the capital of the time, namely the Memphis-Fayyum area. This implies that Tell el-Dab'a has a special role in the contact with Cyprus, as suggested also in other studies, on the basis of the quantity of Cypriot pottery unearthed at the site. However, these contacts do not create further links between Tell el-Dab'a and the other Egyptian sites.

During the Late Second Intermediate period, Tell el-Dab'a, and probably also Tell el-Maskhuta, Sedment, and Tarkhan were probably among the main players in the network of the Cypriot pottery, thus the sites where Cypriot pottery was made and sent from, or sent to. All in all, the network is centred on the Nile delta and the Memphis-Fayyum area, with few instances further south. Tell el-Dab'a and Abydos look like passageways or (re)distribution centres, hence like the sites where the Cypriot pottery was passing through or was (re)distributed from.⁵² Therefore, though the present analysis again suggests that Tell el-Dab'a played a special part in the contact with Cyprus, as demonstrated also by the amount of Cypriot pottery and the manufacture techniques of part of the Tell el-Yahudiyah ware unearthed at the site,⁵³ the analysis of Cypriot pottery does not further show strong connections between Tell el-Dab'a and the other Egyptian sites.

52 Gjesfjeld 2015; Rivers, Knappett, and Evans 2013.

53 Karageorghis 1995; Maguire 1995; Maguire 2009, 21–41; Vilain 2019.

WEAPONS

In this chapter, the focus is on determining the network of contacts suggested by an analysis of the metal weapons of the Late Middle Kingdom and the Second Intermediate Period. The weapons examined in this chapter include axes (and hatchets), spearheads, daggers, and knives. During the periods under examinations, the Egyptians also made use of weapons made from other materials than metal, such as stone. However, only metal weapons have been analysed, because metal objects are subjected more frequently to changes in style across a shorter span of time, therefore they have a more varied typology, which is helpful in detecting similarities and differences between sites.

The axes studied in this chapter have a metal blade with one cutting edge. On the side opposite the edge the blade was attached to a wooden haft, which often has not survived. Axes were used throughout the Egyptian historical periods.¹ A problem shared by all weapons apart from swords is that they were originally developed as tools. An example is the axes with a semi-circular blade, which were like the hatchets used by woodcutters.² Axes could have longer or narrower cutting edges. In the first case, it is possible that they were used for cutting or slashing unprotected flesh, while in the second case they were mostly used for piercing through body armour.³

Spearheads were also made of metal and attached to a wooden shaft. They could be thrown at the enemy, like javelins, used as thrusting weapons (lances), or even used for cutting and slashing, like halberds.⁴ The spearheads unearthed at Tell el-Dab'a were most likely thrown due to their small dimensions and light weight, and because of the fact that they were often found in pairs.⁵ Carrying multiple spears into battle allows a warrior to hurl a spear at

1 Shaw 1991, 34–36.

2 Shaw 1991, 35–36.

3 Philip 2006, 139; Spalinger 2005, 16. It is possible that part of the wounds on the heads of Seqenenra-Ta'a, the ruler of the XVIIth Dynasty who started the war against the Hyksos, were caused by a narrow axe: Philip 2006, 139.

4 Philip 1995a, 71; Philip 2006, 147–48; Shaw 1991, 37; Spalinger 2005, 18–19.

5 Philip 1995a, 71; Philip 2006, 147–48.

the enemy while still having one or more in reserve. From the Middle Kingdom onwards, daggers became the more common weapon for stabbing and slashing.⁶ Daggers have two cutting edges and a piercing tip, to make it easier to stab with. In contrast, knives only have a single cutting edge, so that they could only be used to cut, and were inserted in a wooden handle.⁷ Knives were usually made of thin metal and broke off easily, which is why they are often found incomplete.⁸

In the present work, the parts considered in the description of the axes are: the blade (the part with the cutting edge and attached to the wooden haft); the base (the side of the blade in contact with the haft); the sides (the larger surfaces of the blade); the top and the bottom (the upper and lower edges of the blade). Concerning the spearheads, the parts considered are: the tip (the piercing top of the spearhead); the edges (at each side of the larger surfaces of the spearhead); the shoulders (the two bottom edges of the spearhead, in contact with the tang or the socket, through which the spearhead was attached to a wooden shaft). For the daggers, the parts considered are: the blade; the edges (at each side of the larger surface of the blade); the shoulders (the two top edges of the blade, in contact with the handle); the handle; the pommel (at the top of the handle). As far as the parts of knives are concerned, they include: the blade; the upper edge of the blade; the cutting edge (i.e. the lower edge of the blade); the tip of the blade; the butt (which connects to the handle).

Only the weapons from dated contexts are included in the analysis. Though previous research on the weapons unearthed at Tell el-Dab'a has remarked that, especially concerning the axes and the daggers, each phase had its own preferred type(s),⁹ no attempt has been made to date contexts through weapons in the present research, and only specimens from contexts dated through other means have been taken into consideration. This is because only published material has been used for the present research, and the quality of the available data is often not accurate enough for using the weapons for dating purposes.

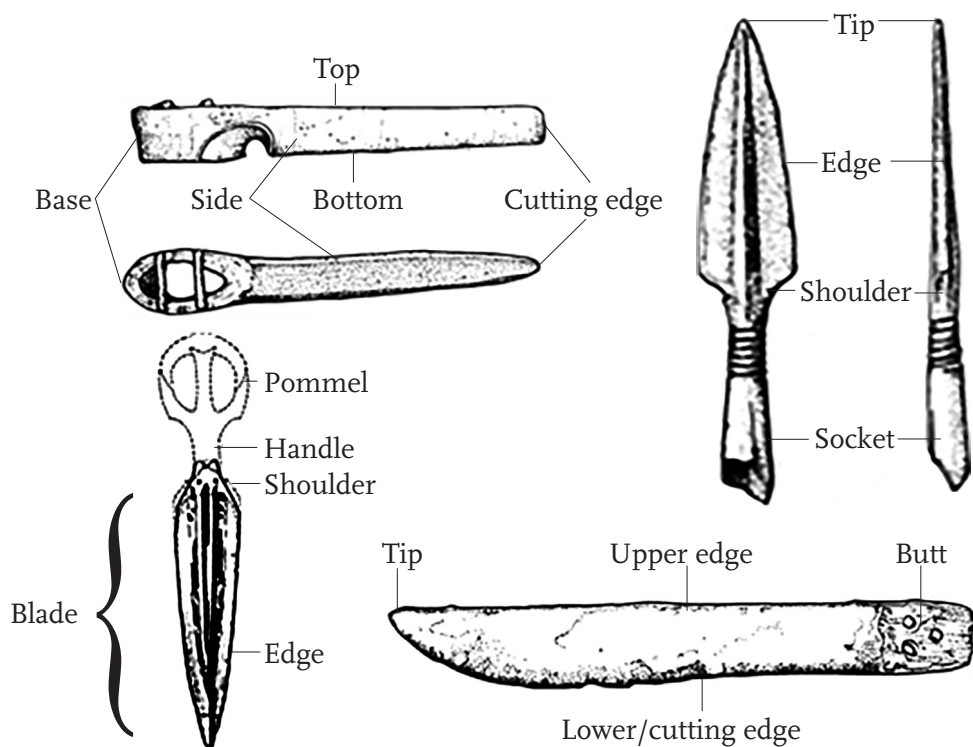
When two or more sites feature similar objects it is probable, depending on the quantity of objects and contexts, that they share an overall similar material culture. Because of the social value of weapons, examined in the next section, encountering the same types across more sites further suggests that these places perhaps shared the same social values. However, similar types excavated at two or more sites, while they suggest contacts between these places, do

6 Shaw 1991, 37.

7 Philip 1995a, 72.

8 Philip 1995a, 72.

9 Philip 1995a, 76; Philip 2006, 141–44.



Drawing 7: Parts of the weapons considered in the present analysis: blade of an axe (top left, side and top view); a spearhead (top right, front and side view); a dagger (bottom left), a knife (bottom right). Drawings after Philip 2006.

not imply direct ones.¹⁰ This comes from the fact that the data examined are only a sample, made of what has been unearthed and published so far.¹¹

Weapons and burial customs

Most metal weapons have been found in tombs and were used as burial equipment. As metal is valuable, the weapons indicate and confer social status. This also suggests that the types recovered from tombs do not necessarily represent the entire range of types nor can they be used uncritically to reconstruct possible fighting techniques, but are only a selection, made of what was considered important or prestigious enough to be deposited as grave goods.¹² Other types of metal weapons not retrieved could actually have been kept in use and reused, and not preserved because no social significance was attached

¹⁰ Brughmans 2013, 638–39; Sindbæk 2013, 74–76, 82; Sindbæk 2007b, 66.

¹¹ Brughmans 2013; Brughmans, Isaksen, and Earl 2012; Knappett 2013; Östborn and Gerding 2014, 81–83; Peeples and Roberts Jr. 2013, 3002.

¹² Philip 2006, 152.

to them.¹³ This is supported by the fact that there are differences between the types of metal weapons retrieved and the ones reported in texts. For example, a comparison of the metal weapons unearthed at Tell el-Dab'a with the metal weapons from Avaris mentioned in the stela of Kamose or in the inscription in the tomb of the general of Ahmose son of Ibana demonstrates the differences.¹⁴

Which metal weapons were deposited in the tombs also varied across time and space, fluctuating with changes in what society considered prestigious. As a result, the same types of metal weapons could be considered differently at different sites, according to the customs of the local communities.¹⁵ From this point of view, striking differences can be noticed between the Eastern Delta and the Nile valley. Only in the Eastern Delta, and not in the Nile Valley, axes and daggers are often found together in tombs, positioned respectively across the abdomen and at the head or shoulder of the deceased, in a fashion common in the Levant.¹⁶ Lastly, at Tell el-Dab'a the axe-dagger pair was associated with pairs of spears during the Late Middle Kingdom.¹⁷

However, both in the Nile Valley and in the Eastern Delta knives were often deposited in tombs. While daggers were positioned beside the deceased,¹⁸ knives were positioned further from the deceased. It is possible that knives were used in burial equipment because they had a symbolic association with the offering of meat.¹⁹ This is supported by depictions of knives in butchery scenes in tomb paintings, as well as by the fact that they have also been found in association with animal bones.²⁰

Another difference between the Eastern Delta and the Nile Valley concerns the types of axes and spearheads found in the tombs.²¹ In the Nile Valley, the axes belong to the types with a wider cutting edge and attached to the haft through lashing, while in the Eastern Delta the axes belong to the types with fenestrations or with narrow cutting edges and attached to the haft through a socket;²² these socketed axes are first found in the Levant.²³ Concerning the spearheads, the types found in the Nile Valley were larger, attached to the shaft using a tang, and found singularly in tombs, while the types found at

13 Philip 2006, 137.

14 Shaw 1991, 39–40.

15 Philip 2006, 137.

16 Philip 1995a, 67.

17 Philip 1995a, 67–71.

18 Philip 1995a, 72; Philip 2006, 218–19.

19 Philip 1995a, 72–74; Philip 2006, 150.

20 Philip 2006, 150 and 219.

21 These differences can be noted also in the database compiled for the present research.

22 Philip 1995a, 71; Philip 2006, 151–52.

23 Philip 1989, 37–41 and 49–55; Philip 1995a, 71; Philip 2006, 138–40.

Tell el-Dab'a were often found in pairs, were usually smaller, and attached to the shaft using a socket;²⁴ these small socketed spearheads are first found, like the socketed axes, in the Levant.²⁵ Moreover, it has been noticed that the types of daggers found in the Eastern Delta resemble types unearthed in the Levant.²⁶

Lastly, it should be noticed that archery was also an important part of Egyptian warfare,²⁷ but while archers' equipment has been unearthed in tombs in Egypt, this is not the case in the Eastern Delta.²⁸ Clearly, this suggests that archery equipment was not considered something that was worth to deposit in tombs by the communities who lived in the Eastern Delta. As stated previously, this does not necessarily have any implications as regards the actual style of warfare engaged by these communities.

All the described differences demonstrate that the Eastern Delta and the Nile Valley attributed different values to weapons and had differences in burial customs. Furthermore, they indicate that the Eastern Delta featured objects and burial customs similar to the ones found in the Levant.²⁹ Nevertheless, the types of weapons found in the Eastern Delta also show that during the Late Second Intermediate Period they stopped imitating closely the ones found in the Levant and acquired features that set them apart.³⁰

Metal weapons could be included in tombs because they had come from distant lands and, therefore, acquired economic value. Hence, metal weapons that, at the site where they were produced, would normally not be an item for burial equipment, could become one at a site where they were imported. This is the case, for example, with an Egyptian axe found in Beirut.³¹ Metal weapons could also have a ritual or ceremonial use,³² as shown by the burial of a woman and her dog at Tell el-Maskhuta; both the woman and her pet had wounds that could have been caused by a narrow axe.³³

24 Philip 1995a, 71; Philip 2006, 152; Shaw 1991, 32.

25 Philip 1989, 88–99; Philip 1995a, 71; Philip 2006, 147–48.

26 Philip 1989, 115–21 and 132–35; Philip 1995a, 71; Philip 2006, 141–44.

27 Shaw 1991, 37.

28 Philip 2006, 152; Shaw 1991, 37.

29 Philip 2006, 138–40 and 151–52.

30 Philip 1995a, 71; Philip 2006, 151–52.

31 This is further suggested by the fact that the mentioned axe had never been sharpened: Philip 2006, 137.

32 Philip 2006, 141.

33 Holladay Jr. 1982, 45.

Weapons: types and production

Weapons from the Levant have been the subject of a detailed typological analysis by G. Philip.³⁴ The features that Philip uses to distinguish between types have been used here as a guide to develop a new typology for the weapons found in Egypt. Certain types developed by Philip have been kept in the present research and renamed in order to fit the typology elaborated.³⁵ It should also be mentioned that the shape could be slightly modified by resharpener the weapons.³⁶ Nevertheless, the overall shape usually remained the same, therefore the typology is not affected.

Metal weapons, as well as other metal objects, could be shaped through hammering or casting. In both cases, the metal had to be smelted in kilns or furnaces. After the metal was smelted, it was then hammered into shape or poured in open moulds or complex, closed forms. Sometimes, hammering could be used after casting to refine the shape or its details.³⁷ Evidence for metalworking has been found in Tell el-Dab'a, where kilns to smelt the metal,³⁸ tuyères (bellows: these deliver a blast of air to a kiln or furnace when compressed),³⁹ as well as clay and stone (limestone and steatite) moulds and forms in which metal was cast to give shape to objects,⁴⁰ and metal remains⁴¹ have been unearthed. The use of specific types of moulds further allowed the development of types: it has been suggested, for example, that the fabrication of daggers with decorated blades was made possible using two-piece steatite moulds.⁴²

The materials used for the fabrication of the metal weapons was copper or, as chemical analyses on the weapons from Tell el-Dab'a have shown,⁴³ an alloy including copper and arsenic (i.e. arsenic bronze), which can be derived from copper ores rich in arsenic,⁴⁴ or copper and tin (i.e. bronze), which could be mined in the Eastern Delta and the Sinai,⁴⁵ or derive from reworking scraps of bronze.⁴⁶ These alloys made it easier to work the weapons and allowed the

34 Philip 1989.

35 An example is given by two types of daggers, which Philip calls Type 13 and Type 17, while in the present work are respectively called type 2 and type 3.

36 See various examples in Philip's catalogue: Philip 2006, 32–83.

37 Lucas 1948, 228–36; Ogden 2000, 149–55.

38 Bietak and Forstner-Müller 2006.

39 Philip 2006, 197–203.

40 Philip 2006, 171–96.

41 Philip 2006, 169–70.

42 Philip 1989, 175–76; Philip 2006, 141.

43 Philip 1995a, 75–77; Philip 1995b; Philip 2006, 209–12.

44 Ogden 2000, 153–54; Philip 1995a, 75–77; Philip 2006, 209–12.

45 Ogden 2000, 171.

46 Philip 1995a, 75–77; Philip 2006, 209–12.

production of sharper and more resistant weapons.⁴⁷ The chemical analyses on the weapons from Tell el-Dab'a also show that, while in the strata dating up to and including the Early Second Intermediate Period, daggers and axes were made of the aforementioned alloys, during the Late Second Intermediate Period they were made mostly of simple copper.⁴⁸ This, together with the fact that weapons were not present in tombs dating to the later part of the Second Intermediate Period, suggests that weapons were not considered objects that conferred or indicated status in tombs anymore: this also reflects a switch from Levantine to Egyptian customs.⁴⁹ Rarely, silver was used for spearheads.⁵⁰

A last problem concerns how to distinguish between tools and weapons. Sometimes, the same object could be meant as one or the other, at different stages of its life or if the context where it was used changed. Unfortunately, the fact that nearly all of objects come from tombs does not allow us for comparisons with similar objects from settlements. Therefore, we cannot say if a type of object – for example a knife or an adze of a certain shape – from a tomb could have been used as a tool in a settlement context, and, as a consequence, with what meaning it was deposited in a tomb. However, the objects included in the analysis are informative of burial customs, as explained above, and lend themselves to an interesting typological classification, as followed in the present work. Therefore, they have been analyzed even if their intended use as weapons and/or tools is not always intelligible.

THE LATE MIDDLE KINGDOM

Half of the contexts of the Late Middle Kingdom with weapons is in Tell el-Dab'a⁵¹ (Table 12 in Appendix I; Appendix VI). The second site with the higher number of contexts is Hu.⁵² These two sites, together with Lahun,⁵³ are also the sites with the largest variety of types. From the other sites examined,

47 Ogden 2000, 151–54.

48 Philip 1995a, 75–77; Philip 1995b; Philip 2006, 209–12.

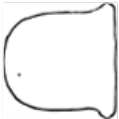
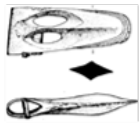
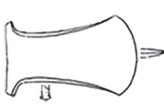
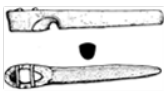
49 Philip 1995a, 75–77; Philip 2006, 209–12.

50 Bietak and Hein 1994, n. 19; Bietak et al. 1994; Philip 2006, 64–67; Schiestl 2009, 377–82.

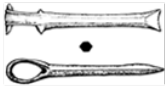
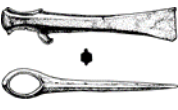
51 Bietak and Hein 1994, ns. 18–19, 23, 34–37, 39; Bietak et al. 1994; Forstner-Müller 2008, 129–33; Philip 2006, 32–35, 42–46, 52–55, 60–68, 75–77; Schiestl 2002, 2009, 269–90, 304–26, 377–82, 405–23, 451–56.

52 Bourriau 2009, 68–69, and 80; Petrie and Mace 1901, 43–44 and 52, pls. XXVII and XXXII.

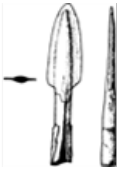
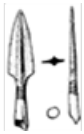
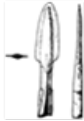
53 Petrie, Griffith, and Newberry 1890, 12, 22, 26 and pls. XIV, XVII; Petrie et al. 1891, 12–13 and pls. VII, XIII.

<i>Type</i>	<i>Description</i>	<i>Outline</i>
Axe Crescent 1	The blade of this type of axe is shaped like a semicircle with a short height and two protrusions from the straight base. It is inserted into collars, through which it is attached to the haft.	
Axe Crescent 2	The blade of this type of axe is shaped like a semicircle with a tall height and two protrusions from the straight base. Probably attached to the haft through lashing.	
Axe Fenestrated 1	The blade of this type of axe has two fenestrations, namely holes, cutting through the side, on which a sharp medial line is also visible, and a convex cutting edge with concentric ridges. It is attached to the haft through a socket.	
Axe Flaring 1	The blade of this type of axe has a flaring profile, with concave top and bottom, a convex cutting edge, and two protrusions from a straight base. Probably attached to the haft through lashing.	
Axe Flaring 2	The blade of this type of axe has a flaring profile, with concave top and bottom, a convex cutting edge, and two protrusions from a concave base. Probably attached to the haft through lashing.	
Axe Flaring 3	The blade of this type of axe has a thick cross-section and a wide flaring profile, with concave top and bottom, a convex cutting edge, and two protrusions from a straight base. Probably attached to the haft through lashing.	
Axe Flaring 4	The blade of this type of axe has a flaring profile, with concave top and bottom, which have also ridges, a convex cutting edge, and two protrusions from a straight base. Probably attached to the haft through lashing.	
Axe Narrow 1	The blade of this type of axe has parallel top and bottom, a square or trapezoidal cross-section, and a straight or concave narrow cutting edge. It is attached to the haft through a socket.	

(continued)

<i>Type</i>	<i>Description</i>	<i>Outline</i>
Axe Narrow 2	The blade of this type of axe has a narrow flaring profile, with concave top and bottom, a hexagonal or oval cross-section, and a straight or concave narrow cutting edge. It is attached to the haft through a socket.	
Axe Narrow 3	The blade of this type of axe has a narrow flaring profile, with concave top and bottom, a hexagonal cross-section with raised ridge, and a straight narrow cutting edge. It is attached to the haft through a socket.	
Axe Trapezoidal 1	The blade of this type of thin axe is shaped like a wedge with a convex cutting edge and a flaring base, which is probably attached to the haft through lashing.	
Axe Trapezoidal 2	The blade of this type of thin axe is shaped like a trapezoid with a convex cutting edge and a triangular base, which is probably attached to the haft through lashing.	
Spearhead Tang 1	This type of spearhead has a rounded tip, a slender and elongated shape, and a narrow midrib. It is attached to the shaft through a tang.	
Spearhead Medium-sized 1	This type of spearhead is large and has a triangular shape with a midrib. It is attached to the shaft through a socket.	
Spearhead Medium-sized 2	This type of spearhead is larger, with very concave edges. It is attached to the shaft through a split socket.	
Spearhead Small 1	This type of spearhead is smaller than the medium-sized ones. It has a rounded tip, a slender shape with angular shoulders, and a narrow midrib. It is attached to the shaft through a long socket.	

(continued)

<i>Type</i>	<i>Description</i>	<i>Outline</i>
Spearhead Small 2	This type of spearhead is smaller than the medium-sized ones. It has convex edges, a round midrib, rounded or square shoulders, sometimes with “fins”, and a split socket, which can be decorated with grooves or horizontal ridges or other incised decoration. The shape can also be elongated, and the tip can be also rounded or bevelled.	
Spearhead Small 3	This type of spearhead is smaller than the medium-sized ones. It has convex edges or a tapering shape, incurved or square shoulders, and a pronounced midrib. The tip can be angled.	
Spearhead Very small 1	This type of spearhead is smaller than the medium-sized and the small ones. It has convex edges or a tapering shape, a rounded midrib, a split socket, and square, rounded, or angled shoulders.	
Spearhead Very small 2	This type of spearhead is smaller than the medium-sized and the small ones. It can be slender and tapering, with V-shaped midrib and socket pinched at the junction with the edges, or it can have convex edges, a round midrib, straight shoulders, and a split socket.	
Dagger 1	The blade of this type of dagger has convex edges and a V-shaped midrib with central groove. The handle has a stem with square cross-section and a crescent-shaped ivory pommel secured by metal studs.	
Dagger 2	The blade of this type of dagger has convex, or rarely concave, edges, or a tapering shape, as well as square shoulders, and three or five midribs converging in V-shapes towards the tip; between the outer midribs can be lines perpendicular or parallel to the same midribs, or the top of the midribs can end in spirals. For the handle there is a tapering, or rectangular, or trapezoidal, or semi-circular tang; it can have rivets, or an extension with square cross-section, with a sub-globular pommel. In one example, the handle has gold leaf and a tang tapering to a stem, to which a sub-globular ivory pommel, covered by a lotus-shaped copper-base wire framework, was attached.	

(continued)

<i>Type</i>	<i>Description</i>	<i>Outline</i>
Dagger 3	The blade of this type of dagger has convex edges, or a thin or slender and tapering shape, with square shoulders and sometimes a lens-shaped cross-section; it is characterized by a raised medial zone, sometimes flattened. The handle can be riveted and with triangular, or rectangular, or trapezoidal tang; one example has a symmetrical handle with central upper point indented, and a round or crescent ivory pommel.	
Dagger 4	The blade of this type of dagger has a slender and tapering shape, or concave edges, with square or angled shoulders, and a cross-lens or rhomboidal cross-section; it is undecorated, but sometimes it has a medial line. The handle has a rectangular or trapezoidal tang with rivets.	
Dagger 5	The blade of this type of dagger has convex edges and a plain surface. The handle is riveted and can be symmetrical with central upper point indented, ending in a round ivory pommel; one example has silver rosettes on the handle.	
Dagger 6	The blade of this type of dagger has concave edges, mostly angular shoulders, and a raised medial zone. The handle is riveted and can have a rectangular tang; one example has a symmetrical handle with central upper point indented and a crescent ivory pommel.	
Dagger 7	The blade of this type of dagger is undecorated has a triangular, more rarely tapering, shape, angled or, more rarely, square shoulders, and sometimes a lens-shaped cross-section. The handle can be flaring and with a crescent at the top; in a few examples a trapezoidal or triangular tang, often riveted, is visible.	
Dagger 8	The blade of this type of dagger is broad and most often undecorated, with concave edges and sometimes angular shoulders, and sometimes a lens-shaped cross-section. The handle can have a riveted or a rectangular tang.	
Dagger 9	This type of dagger is shaped like a sickle, with midrib on the side and a tapering tang with three rivet holes in a triangular arrangement.	

(continued)

<i>Type</i>	<i>Description</i>	<i>Outline</i>
Dagger 10	The blade of this type of dagger has a slender and tapering shape, with rhomboidal cross-section and a sharp medial line. The handle is thin and has a crescent at the top.	
Dagger 11	The blade of this type has concave edges and a sharp medial line. Concerning the handle, in one example only its rectangular tang is visible, while in another example it is worked with rosettes, which are filled with stones, and has a crescent at the top.	
Knife 1	This type of knife has the cutting edge curving in a more rounded or angular shape near or at the tip. The blade is attached to the handle through a riveted trapezoidal, rounded, or stepped butt; the number of rivets is two, or three, or four, respectively arranged in a horizontal line, in a triangle, or in a square. The tip can be rolled.	
Knife 2	The blade of this type of knife has the cutting edge curving in a more rounded or angular shape near the butt. This blade is attached to the handle through a rectangular tang, usually thin, which can sometimes be long.	
Knife 3	The blade of this type of knife has parallel edges and a round tip. This blade is attached to the handle through a riveted butt, which curves down at the end.	
Knife 4	The blade of this type of knife has parallel edges and a straight tip. This blade is attached to the handle through a tang, which has a downward protrusion at the end.	
Knife 5	The blade of this type of knife has a concave upper edge and a convex cutting edge. This blade is attached to the handle through a rectangular tang.	

Table 6: Description and outline of the main types of weapons.

Drawings after: Bietak and Hein 1994; Brunton and Morant 1937; De Morgan 1895; Forstner-Müller 2008; Garstang, Newberry, and Milte 1901; Petrie, Griffith, and Newberry 1890; Petrie and Mace 1901; Petrie and Duncan 1906; Petrie and Walker 1909; Philip 2006; Randall-MacIver et al. 1902; Redmount 1989; Yacoub 1983.

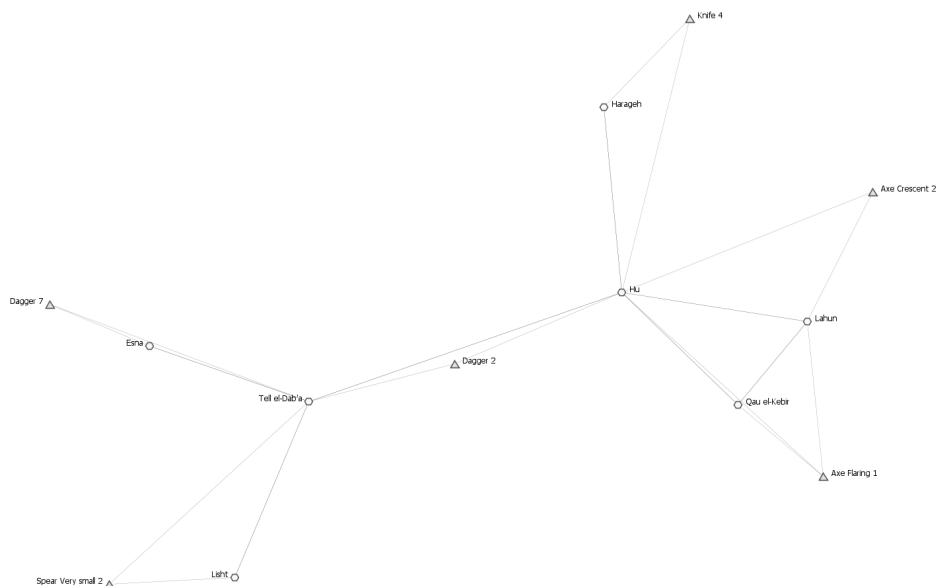


Figure 106: Contexts of the Late Middle Kingdom and the most common types of weapons.

namely Dahshur,⁵⁴ Lisht,⁵⁵ Harageh,⁵⁶ Qau el-Kebir,⁵⁷ Abydos,⁵⁸ Esna,⁵⁹ and Edfu,⁶⁰ only one or two contexts with weapons, and one type of weapon, have been included in the analysis. Nearly all the contexts come from non-royal burials, while the only two contexts from royal burials are found at Dahshur.⁶¹ The only contexts that are not burials have been excavated at Tell el-Dab'a⁶² and Lahun.⁶³

The axes included in the analysis of this period are of both crescent (Crescent 1 and 2) and trapezoidal (Trapezoidal 1 and 2) types, as well as nearly all the types of flaring axes (Flaring 1, 3 and 4), the fenestrated axes, and only the narrow axes with parallel edges (Narrow 1). Nearly all the types of spearheads (Small 2 and 3, and Very small 1 and 2) are examined for this period, with the exception of three larger types, as well as nearly all the types of knives (types 1, 2, 4, and 5), with the exception of the type with parallel edges and rounded

54 De Morgan, Legrain, and Jéquier 1903, 48–52 and pl. VI; De Morgan et al. 1895, 113.

55 Bietak and Hein 1994, n. 49.

56 Engelbach and Gunn 1923, pl. XV.8.

57 Brunton, Gardiner, and Petrie 1930, 13 and pl. XXI.

58 Peet and Loat 1913, 26–27 and pl. IX.22.

59 Downes 1974, 8 and 102–5.

60 Michałowski et al. 1939, 51–53 and pl. XXIII.

61 De Morgan, Legrain, and Jéquier 1903, 48–52 and pl. VI; De Morgan et al. 1895, 113.

62 Philip 2006, 53–54.

63 Petrie, Griffith, and Newberry 1890, 12, 22, 26 and pls. XIV, XVII; Petrie et al. 1891, 12–13 and pls. VII, XIII.

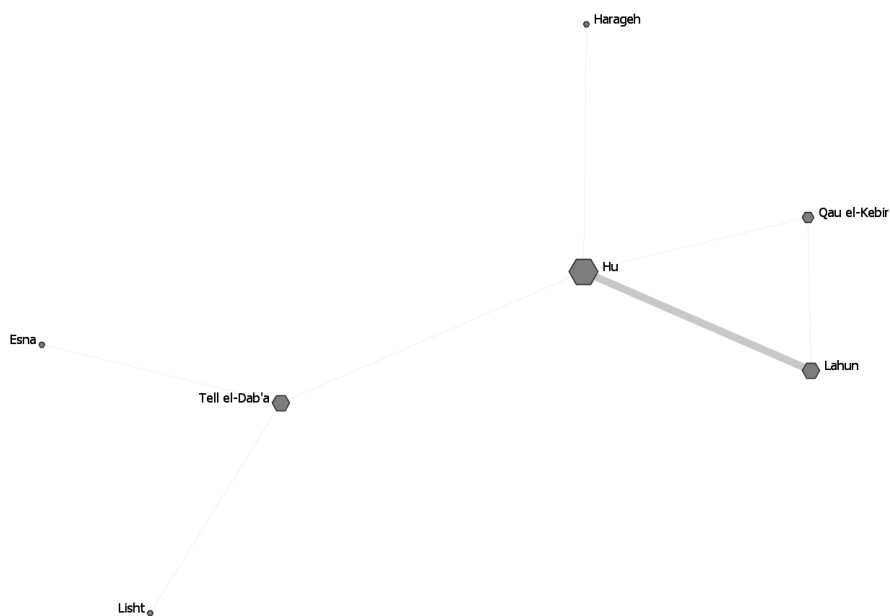


Figure 107: Degree centrality of the first one-mode graph of the weapons during the LMK.

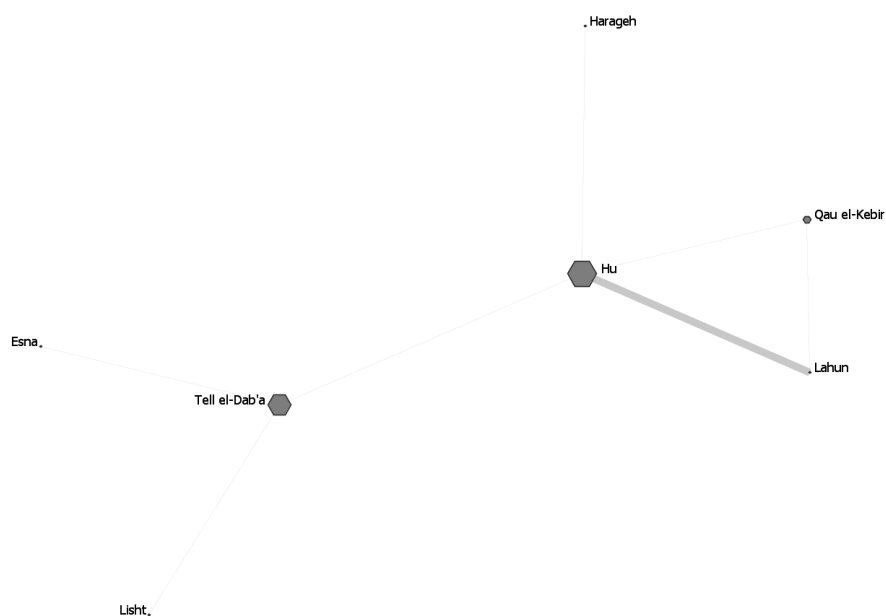


Figure 108: Betweenness centrality of the first one-mode graph of the weapons during the LMK.

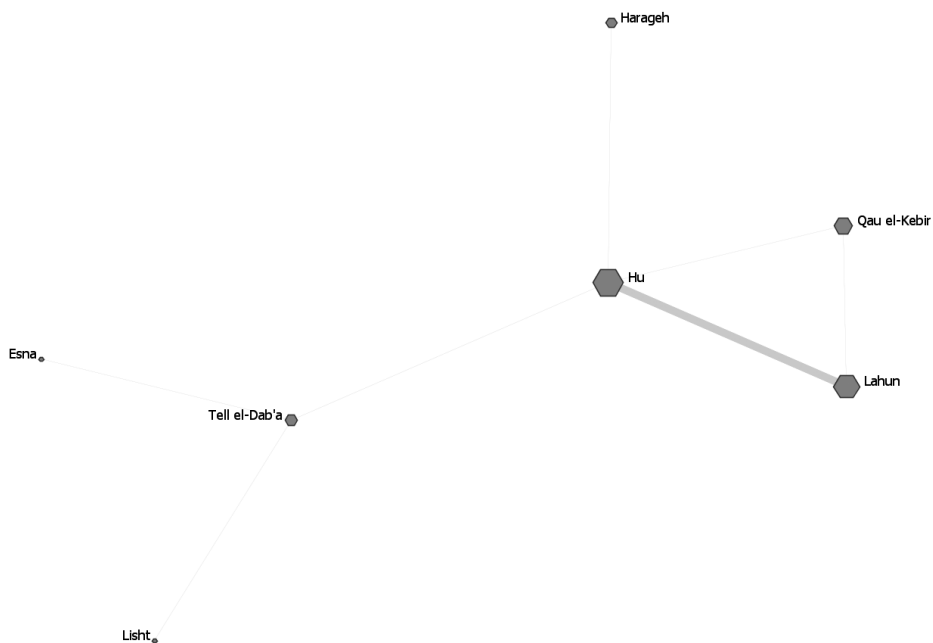


Figure 109: Eigenvector centrality of the first one-mode graph of the weapons during the LMK.

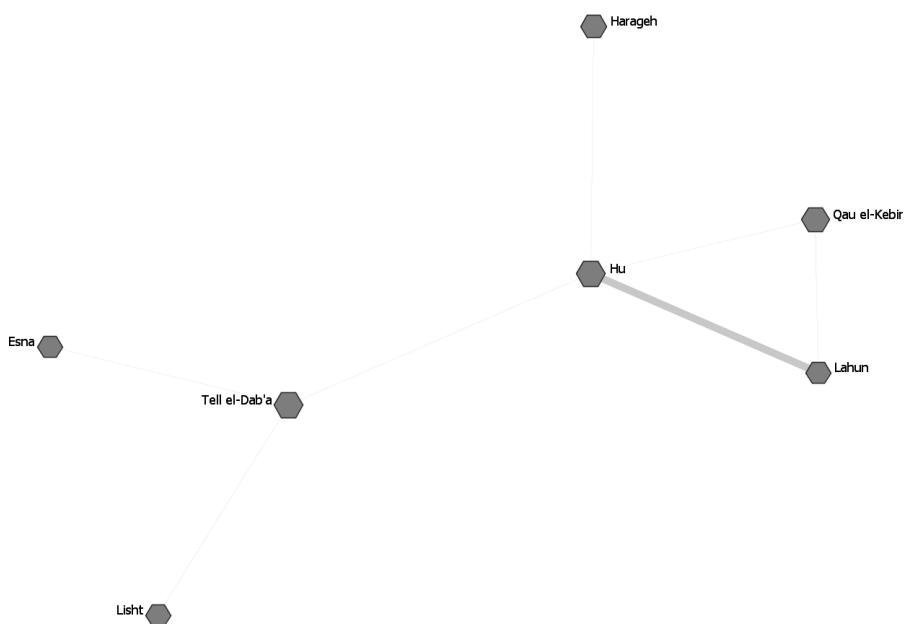


Figure 110: Closeness centrality of the first one-mode graph of the weapons during the LMK.

tip. Finally, the daggers analysed for this period include types with decorated blades or types with plain blades and concave edges (types 1, 2, 3, 6, 7, 8, and 11). All these types and their connections to the sites where they are found can be seen in Figure 106.

All the weapons are made of copper, either simple or in alloys as explained above. The only exception is a pair of silver spearheads from a tomb in Tell el-Dab'a.⁶⁴

The first one-mode graph

The network constructed for the Late Middle Kingdom based on the types of weapons shared (Figures 107–110) show few connections, involving mostly Tell el-Dab'a in the north and Hu in the south. Besides Hu, Tell el-Dab'a is connected also to Lisht in the Memphis-Fayyum area and Esna in the south, based mostly on shared types of daggers and spearheads. Hu is connected to Qau el-Kebir in Middle Egypt and to Harageh and Lahun in the Memphis-Fayyum area, while Qau el-Kebir and Lahun also share a connection: all these connections are based on shared types of axes and knives. Lastly, Dahshur, Abydos, and Edfu do not share any connection.

The centrality measures (Tables 29, 42, 55, 68 in Appendix II) show that the closeness centrality is very similar for all the sites connected and does not demonstrate differences in how these could be reached in the network; therefore, this measure is not very informative. Concerning the other measures, Tell el-Dab'a, Lahun, and Hu score in the high or very high rank for the degree and the eigenvector centrality. Therefore, they are the better-connected sites, with the higher number of types in common with the higher number of sites, in the network of the weapons. Qau el-Kebir has a similar pattern too, but its scores are in the middle and high rank, thus its role looks less prominent in the network. Hu also has a very high betweenness centrality, which increases its importance in the network and suggests a role of intermediary for the site in the network of the weapons. Lisht, Harageh, and Esna have low or very low scores. This means that they created no, or very weak, connections in the network of the weapons, based on the available data. Finally, Dahshur, Abydos, and Edfu have very low scores for all the measures, because they are not connected to any site and are, thus, isolated in the network of the weapons.

The one-mode graph based on the Jaccard similarity

The structure of the network elaborated through the Jaccard algorithm (Figures 111–114) is, as usual, like the one of the first one-mode graph, elaborated

64 Bietak and Hein 1994, n. 19; Bietak et al. 1994; Philip 2006, 64–67; Schiestl 2009, 377–82.

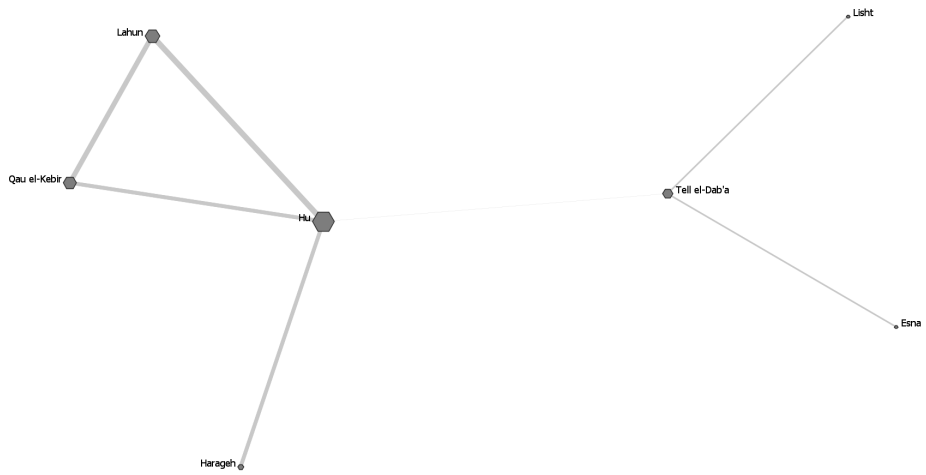


Figure 111: Degree centrality of the second one-mode graph of the weapons during the LMK.

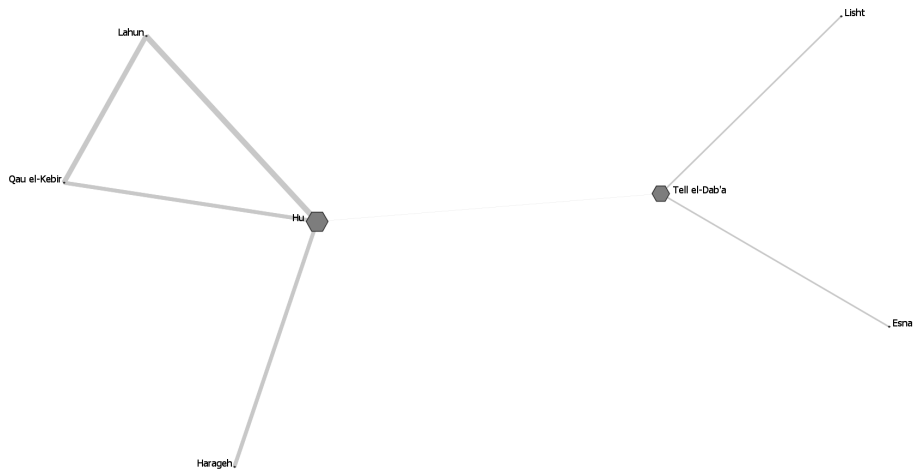


Figure 112: Betweenness centrality of the second one-mode graph of the weapons during the LMK.

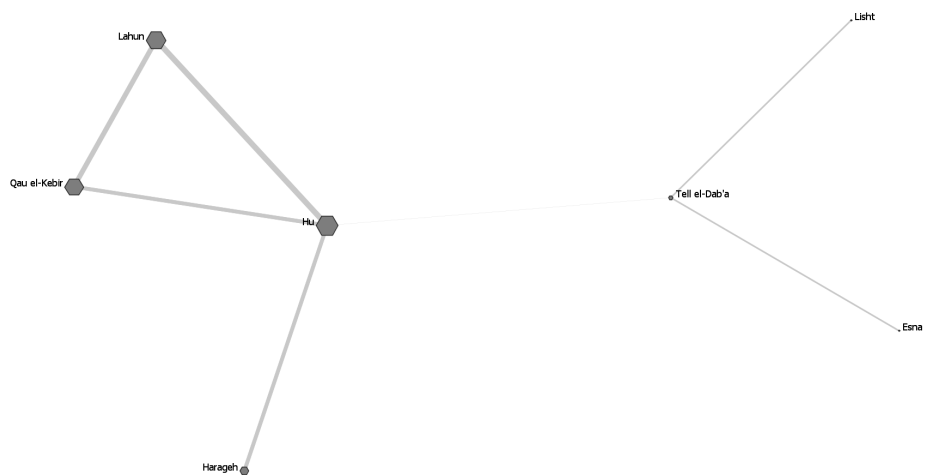


Figure 113: Eigenvector centrality of the second one-mode graph of the weapons during the LMK.

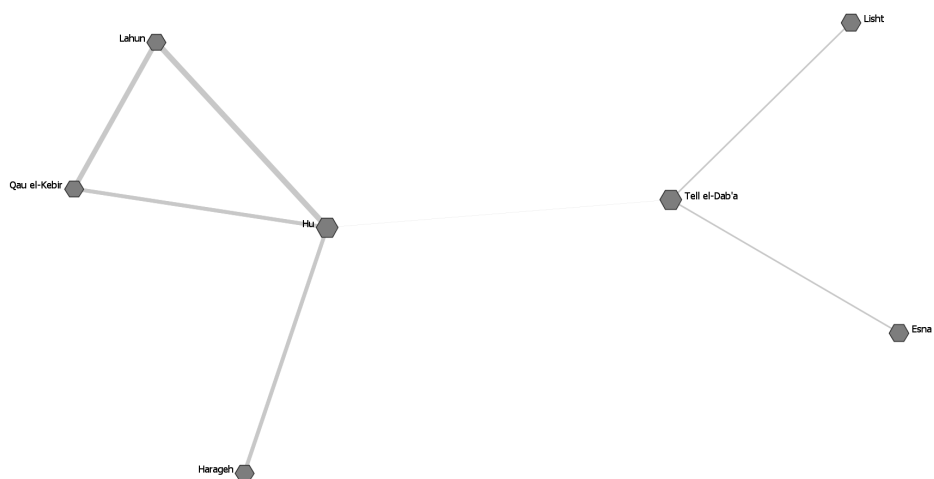


Figure 114: Closeness centrality of the second one-mode graph of the weapons during the LMK.

based on the shared types. The centrality measures (Tables 81, 94, 107, 120 in Appendix III) follow a very similar pattern to the one detected for the first one-mode graph. Therefore, the closeness centrality is still very similar for all the connected sites. Hu and Lahun are still among the better-connected sites, and Hu still has a very high betweenness, while Lisht, Esna, Dahshur, Abydos, and Edfu have low or very low scores. Only Tell el-Dab'a and Harageh show a small difference, because they respectively score lower for the degree centrality and higher for the eigenvector centrality.

The similarity of the scores of the two networks derives from the fact that there are no types of weapons really common among the sites, because even the types that create connections are found at no more than two or three sites. Hence, considering only the shared types or the full range of weapons does not create much difference. Nevertheless, there are still types found at more than one site and types unique to a site. The proportion between these two groups in the range of Tell el-Dab'a and Harageh accounts for the differences in the scores of these two sites: they appear more important when only the types in common are taken into consideration.

Summary

During the Late Middle Kingdom, the main players in the network created by the weapons are Tell el-Dab'a, Lahun, and Hu. Thus, these have the same result patterns as the starting or ending points of the lines of communication in the network, and where new trends could be spread from.⁶⁵ Moreover, Hu appears as an intermediary, thus it brings together types of objects that are found separately at different sites, like a passageway or a (re)distribution centre.⁶⁶

Weapons have been found mostly as grave goods. Therefore, the deposition of different weapons can indicate different burial customs. This can be seen by the fact that the group including Tell el-Dab'a, Esna, and Lisht is connected through daggers and spearheads from burial contexts, while the group including Hu, Qau el-Kebir, and Lahun is connected through axes and knives from both burial and settlement contexts. Hu could be the site where the two groups came together. However, the sample examined is very small, hence the suggested theory can be further developed and adjusted when data are added.

65 Östborn and Gerding 2015.

66 Gjesfeld 2015; Rivers, Knappett, and Evans 2013.



Figure 115: Contexts of the Early Second Intermediate Period and their weapons.

THE EARLY SECOND INTERMEDIATE PERIOD

The sites with weapons analysed for this period are only four (Table 18 in Appendix I; Appendix VII). These sites include Tell el-Dab'a,⁶⁷ Qau el-Kebir,⁶⁸ Abydos,⁶⁹ and Hu,⁷⁰ all of which are included also in the analysis of the Late Middle Kingdom. The contexts examined for this period are noticeably fewer than in the Late Middle Kingdom. Half of them has been excavated in Tell el-Dab'a,⁷¹ which has also the larger variety of types. From Abydos,⁷² four contexts have been included in the analysis, while from Qau el-Kebir⁷³ and Hu⁷⁴ only two contexts have been included. All these contexts come from burials, while only one context comes from a settlement, from Tell el-Dab'a.⁷⁵

As far as the types examined for this period are concerned, these include axes only of flaring or narrow types (types Flaring 1, Narrow 1, both of which are also in the analysis of the Late Middle Kingdom, and Narrow 2). The

67 Bietak and Hein 1994, n. 209; Bietak, Mlinar, and Schwab 1991, 54–70; Forstner-Müller 2001, 217; Forstner-Müller 2008, 148–51 and 177–99; Philip 2006, 33–47 and 59–77.

68 Brunton, Gardiner, and Petrie 1930, 13 and pl. XXI.

69 Garstang, Newberry, and Milte 1901, 11–12, pls. XIV and XVI; Randall-MacIver, Mace, and Griffith 1902, 101 and pl. XLVII.

70 Bourriau 2009, 74; Petrie and Mace 1901, 45 and 52, pls. XXXII and XXXVIII; Bourriau 1981, 34.

71 Bietak and Hein 1994, n. 209; Bietak, Mlinar, and Schwab 1991, 54–70; Forstner-Müller 2001, 217; Forstner-Müller 2008, 148–51 and 177–99; Philip 2006, 33–47 and 59–77.

72 Garstang, Newberry, and Milte 1901, 11–12, pls. XIV and XVI; Randall-MacIver, Mace, and Griffith 1902, 101 and pl. XLVII.

73 Brunton, Gardiner, and Petrie 1930, 13 and pl. XXI.

74 Bourriau 1981a, 34; Petrie and Mace 1901, 45 and 52, pls. XXXII and XXXVIII.

75 Philip 2006, 75–77.

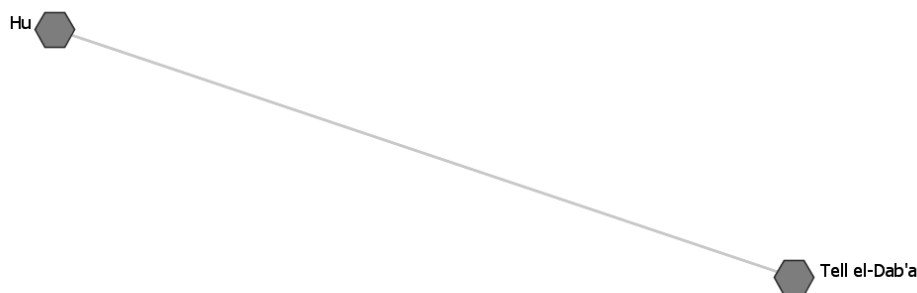


Figure 116: First one-mode graph of the weapons during the ESIP.

spearheads included in the analysis of this period are tanged or of larger size (types Tang 1 and Medium-sized 2), as well as the smaller ones, included also in the analysis of the Late Middle Kingdom (types Small 3 and Very small 2). The knives included in the analysis of this period are only of riveted types (types 1, found also in the analysis of the Late Middle Kingdom, and 3). The daggers included in the analysis of this period have a V-shaped midrib or a raised medial zone (types 2 and 3), found also in the analysis of the Late Middle Kingdom, or a convex plain blade (type 5), or are sickle-shaped (type 9).

All the weapons analysed are made of copper or copper-based alloys.

Contacts in the Early Second Intermediate Period

For the Early Second Intermediate Period (Figure 115), only Tell el-Dab'a and Hu share one type, specifically a knife of type 1 (Figure 116). Hence, only these two sites are in contact through weapons. Nevertheless, the very small size of the sample does not allow to rule the possibility that more contacts could exist based on the weapons, even between more sites of this chronological phase.

THE LATE SECOND INTERMEDIATE PERIOD

Among the sites with weapons examined for this phase, Tell el-Dab'a⁷⁶ and Qau el-Kebir,⁷⁷ were included in the analysis of both the Late Middle kingdom and the Early Second Intermediate Period, while all the other ones are found

76 Bietak and Hein 1994, ns. 207–8; Bietak, Mlinar, and Schwab 1991, 182–89, 281; Forstner-Müller 2008, 232–37, 251–82, 294–99, 377–82; Philip 2006, 35–41, 47–55, 65–82.

77 Brunton, Gardiner, and Petrie 1930, 5 and 13, pls. IX and XXI.

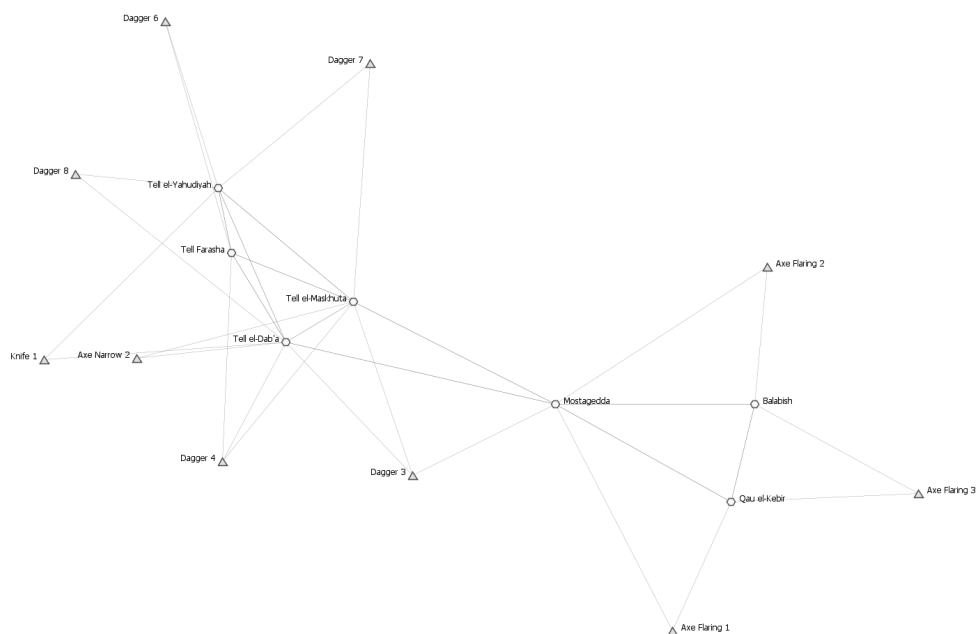


Figure 117: Contexts of the Late Second Intermediate Period and the most common types of weapons.

for the first time (Table 22 in Appendix I; Appendix VIII). These sites are Tell el-Maskhuta,⁷⁸ Tell el-Yahudiyah,⁷⁹ Tell Farasha,⁸⁰ Mostagedda,⁸¹ Balabish,⁸² and the Theban area.⁸³ During this period, like during both the Late Middle Kingdom and the Early Second Intermediate Period, Tell el-Dab'a is the site with half of the contexts included in the analysis and with the larger variety of types,⁸⁴ and the only site where settlement contexts have been examined.⁸⁵ The second site with the highest number of contexts and the larger variety of types of weapons analysed is Mostagedda.⁸⁶ The same variety is found also

78 Redmount 1989, 910–45.

79 Petrie and Duncan 1906, 12–13 and pls. V–VI.

80 Yacoub 1983.

81 Bietak and Hein 1994, n. 304; Brunton and Morant 1937, 127–28, pls. LXXIV and LXX-VII.

82 Wainwright and Whittemore 1920, 9–13 and 32, pls. III and XIII.

83 Bietak and Hein 1994, n. 382; Bourriau 1981a, 34; Petrie and Walker 1909, 7, pls. XXII and XXV.

84 Bietak and Hein 1994, ns. 207–8; Bietak, Mlinar, and Schwab 1991, 182–89, 281; Forstner-Müller 2008, 232–37, 251–82, 294–99, 377–82; Philip 2006, 35–41, 47–55, 65–82.

85 Philip 2006, 54–55, 71–72, 78–82.

86 Bietak and Hein 1994, n. 304; Brunton and Morant 1937, 127–28, pls. LXXIV and LXX-VII.

in sites of the Delta, namely Tell el-Yahudiyah,⁸⁷ Tell el-Maskhuta,⁸⁸ and Tell Farasha.⁸⁹ These three sites, as well as Qau el-Kebir,⁹⁰ Balabish,⁹¹ and the Theban area,⁹² have contributed between two and four contexts to the analysis of the weapons during this period.

Concerning the types analysed for this period, visible in Figure 117, these include axes of nearly all the flaring and narrow types, and of all the trapezoidal types (types Trapezoidal 1 and 2, Flaring 1, all three found in the analysis of both the Late Middle Kingdom and the Early Second Intermediate Period, Flaring 2, Flaring 3, found also in the analysis of the Late Middle Kingdom, Narrow 2, found also in the analysis of the Early Second Intermediate Period, and Narrow 3). The spearheads included in the analysis of this period are of all sizes (types Medium-sized 1, Small 1, and Very small 1; the latter is found also in the analysis of the Late Middle Kingdom). The types of knives included in the analysis of this period are the same as in the analysis of the Late Middle Kingdom (types 1, 2, 4, and 5). The daggers included in the analysis of this period have a raised medial zone or a plain blade, or a tapering blade with sharp medial zone (types 3, found in the analysis of both the Late Middle Kingdom and the Early Second Intermediate Period, 4, 5, found also in the analysis of the Early Second Intermediate Period, 6, 7, 8, all three found also in the analysis of the Late Middle Kingdom, and 10).

All the weapons analysed are made of copper or copper-based alloys.

The first one-mode graph

The network elaborated for the Late Second Intermediate Period based on the types of weapons shared (Figures 118–121) shows two main clusters. Of these, one involves the sites in the Eastern Delta, namely Tell el-Farasha, Tell el-Yahudiyah, Tell el-Maskhuta, and Tell el-Dab'a, with the stronger connections between the last three sites. The other one involves the sites in Middle and southern Upper Egypt, namely Mostagedda, Qau el-Kebir, and Balabish. Mostagedda is the sites that connects these two clusters, because it shares connections also with Tell el-Maskhuta and Tell el-Dab'a. Lastly, the Theban area share no connections with the other sites.

Concerning the centrality measures (Tables 37, 50, 63, 76 in Appendix II), the closeness centrality is very similar for all the sites that are connected.

87 Petrie and Duncan 1906, 12–13 and pls. V–VI.

88 Redmount 1989, 910–45.

89 Yacoub 1983.

90 Brunton, Gardiner, and Petrie 1930, 5 and 13, pls. IX and XXI.

91 Wainwright and Whittemore 1920, 9–13 and 32, pls. III and XIII.

92 Bietak and Hein 1994, n. 382; Bourriau 1981a, 34; Petrie and Walker 1909, 7, pls. XXII and XXV.

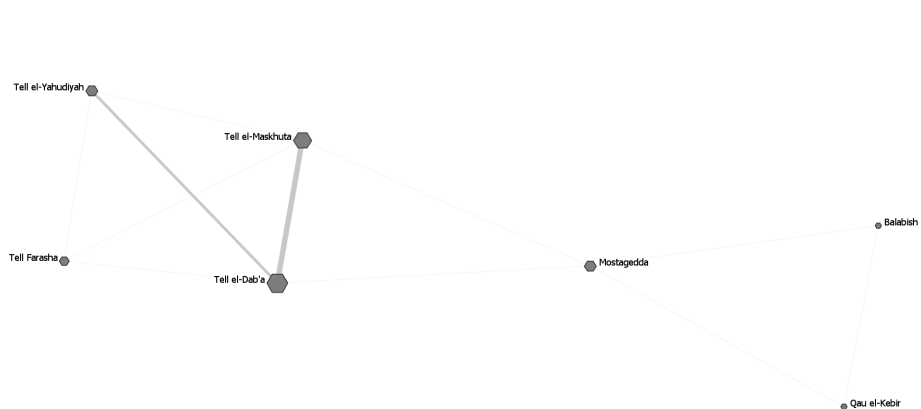


Figure 118: Degree centrality of the first one-mode graph of the weapons during the LSIP.

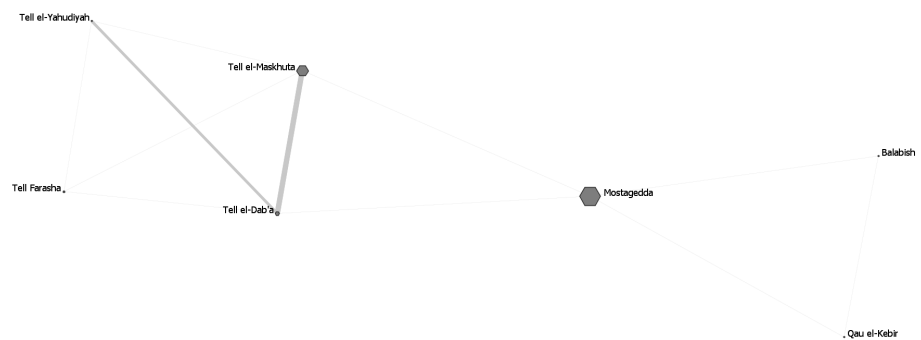


Figure 119: Betweenness centrality of the first one-mode graph of the weapons during the LSIP.

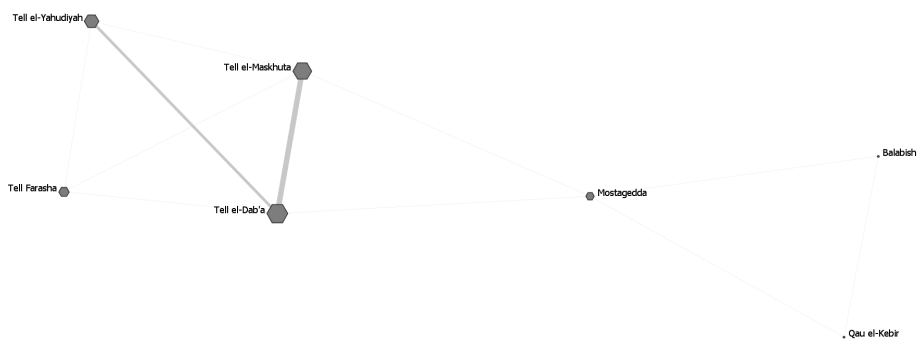


Figure 120: Eigenvector centrality of the first one-mode graph of the weapons during the LSIP.

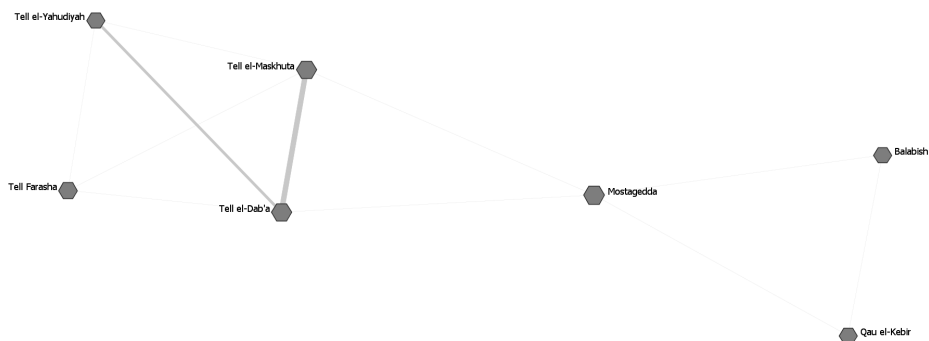


Figure 121: Closeness centrality of the first one-mode graph of the weapons during the LSIP.

Therefore, it does not indicate differences in how these could be reached in the network of the weapons. Tell el-Dab'a and Tell el-Maskhuta score in the high or very high rank for the degree and the eigenvector centrality. This means that they are the better-connected sites, with the higher number of types shared with the higher number of sites, in the network of the weapons. Also Tell el-Yahudiyah and Tell Farasha has a similar pattern, but they score mostly in the middle rank, thus they appear to have a less prominent in the network. Mostagedda is characterized by a very high betweenness centrality, which suggests its role of intermediary in the network of the weapons. This is already expected from the shape of the network because it connects the two main clusters of sites. At the same time, Qau el-Kebir and Balabish are characterized by low or very low scores. This implies that they established no, or very weak, connections in the network of the weapons, based on the available data. The Theban area has very low scores for all the measures because it is not connected to any site and is, therefore, isolated in the network of the weapons.

The one-mode graph based on the Jaccard similarity

The structure of the network detected through the Jaccard algorithm (Figures 122–125) is, as usual, like the one of the first one-mode graph, which is based on the shared types. As far as the centrality measures (Tables 89, 102, 115, 128 in Appendix III) are concerned, the closeness centrality is still very similar for all the connected sites. Moreover, for half of the examined sites the measures follow a pattern like the previous one. Hence, Tell el-Dab'a and Tell el-Maskhuta are still among the better-connected sites, while Tell Farasha scores mostly in the middle rank, and the Theban area has very low scores.

The remaining four sites appear more important than in the previous graph, because they score in the high or very high ranks for the degree and

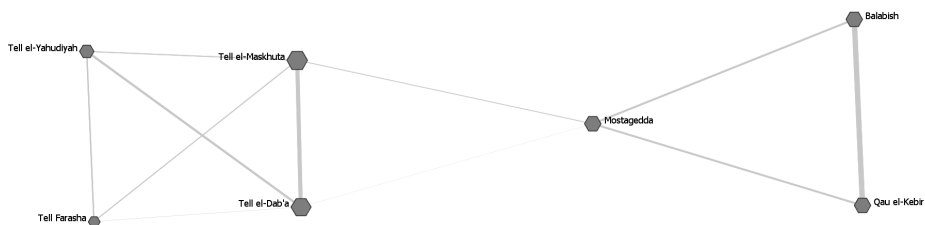


Figure 122: Degree centrality of the second one-mode graph of the weapons during the LSIP.

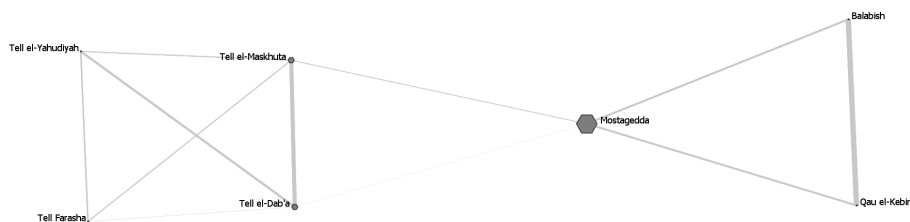


Figure 123: Betweenness centrality of the second one-mode graph of the weapons during the LSIP.

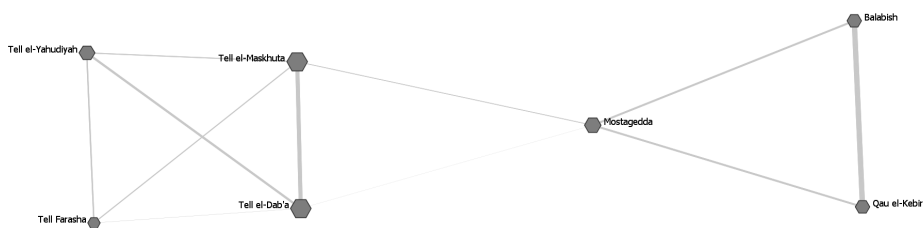


Figure 124: Eigenvector centrality of the second one-mode graph of the weapons during the LSIP.

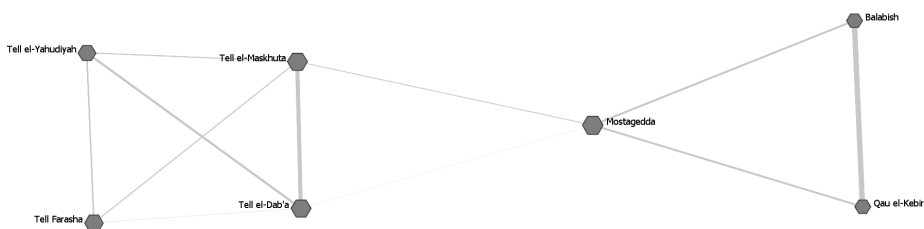


Figure 125: Closeness centrality of the second one-mode graph of the weapons during the LSIP.

the eigenvector centrality, appearing also like the better-connected sites. Mostagedda still has a very high betweenness, thus its role as an intermediary is still suggested. The differences detected derive from the fact that the mentioned sites share part of their range of types of weapons, but this part does not include the types more often shared among the sites. Hence, these sites appear less important when only the shared types are analysed.

Summary

During the Late Second Intermediate Period, the main players in the network of the weapons are Tell el-Dab'a, Tell el-Maskhuta, and, when the full range of types is analysed, Tell el-Yahudiyah, Mostagedda, Qau el-Kebir, and Balabish. Therefore, these sites were probably the starting or ending points of the lines of communication in the network, and where new trends could start.⁹³ Furthermore, Mostagedda look also like an intermediary, thus as a passageway or a (re)distribution centre, where the weapons could pass through or be (re)distributed from.⁹⁴

THE CORRESPONDENCE ANALYSIS

The scores detected in the analysis of the weapons have been also examined through correspondence analysis. The aim is to study if the variety of types discovered at the sites affects the measures calculated in this chapter, thus if a correlation between the scores and the archaeological bias is present. The results (Appendix IV) for the Late Middle Kingdom and the Late Second Intermediate Period show a slight tendency of sites with higher variety of types to score higher for the degree centrality and the eigenvector centrality, but not for the betweenness centrality. This tendency increases slightly in the analysis of the Late Second Intermediate Period, probably because the number of sites and types is smaller and thus, the results are slightly more susceptible to archaeological bias. Nevertheless, the same tendency decreases when the scores of the second one-mode graph are considered. Therefore, a larger number of types does not necessarily imply higher scores, and the results are not ineluctably influenced by archaeological bias.

CONCLUDING REMARKS

During the Late Middle Kingdom, the sites of Tell el-Dab'a, Lahun, and Hu look like the main sites in the network of weapons, while Hu appears as an intermediary. There is the possibility that the group formed by Tell el-Dab'a,

93 Östborn and Gerding 2015.

94 Gjesfeld 2015; Rivers, Knappett, and Evans 2013.

Esna, and Lisht, and the group formed by Hu, Qau el-Kebir, and Lahun reflect communities with two different social practices, while Hu could be the site where both of them came together. Nevertheless, it has been remarked that the sample examined is very small: the possibility for further discoveries and developments in the suggested theory is expected.

During the Early Second Intermediate Period, only Tell el-Dab'a and Hu are connected, through only one type of knife. At this stage no further remarks can be made, given the small sample analysed.

During the Late Second Intermediate Period, the network is divided into two clusters, of which one involving the sites in Lower Egypt, and one involving the sites in Middle Egypt. Tell el-Maskhuta, Tell el-Dab'a and, possibly, Tell el-Yahudiyah, are the main players in the first cluster, while Mostagedda, Qau el-Kebir, and Balabish are the main players in the second clusters: these were possibly the sites where the weapons sent from or destined to, and where new trends could spread from. Mostagedda was also a passageway or (re)distribution centre, thus the place where the weapons would pass by to reach other sites, or where they would be (re)distributed from. The isolation of the Theban area, which thus appears as a third, separate cluster, in the network of weapons could support what is known from previous research on burial customs: that its burial customs differed from the ones followed in the rest of Egypt.⁹⁵

95 As shown by the pottery and burial customs discussed in: Miniaci 2011; Seiler 2005.

NETWORKS OF MATERIALS

This chapter deals with the circulation of materials during the Late Middle Kingdom and the Second Intermediate Period. More specifically, the distribution of the materials used to produce the objects analysed in the present work, and the connections they create, are examined. The distribution of the different materials is summarized in Table 129.

The reason for this further analysis is that, while **certain** materials **are** widely found, others have a defined geographical provenance. Therefore, studying how these materials are distributed can help understand how they circulated from their sources and, consequently, shed further light on the relations between different sites. Furthermore, if a particular category of objects made of the same material is found on multiple sites, but there are no shapes shared between these sites, this could imply that they were manufactured locally.

To have a clearer image, each section deals with lithic materials according to the location of their sources (i.e. the Sinai, the central and southern part of Egypt, the southernmost part of Egypt, the lithic materials widely found in Egypt, and the ones that had to be imported). Successively, another two sections deal with metals and with organic materials, because their industries are different from the lithic ones.

LITHIC MATERIALS FROM THE SINAI

Turquoise was mined in the Sinai (numbers 2 and 3 on Map 1).¹ Rock crystal was present in the same area, as well as in the Western Desert, between the oases of Fayyum and Bahariya.²

1 Aston, Harrell, and Shaw 2000, 62–63; Lucas 1948, 460–61.

2 B.G. Aston 1994, 64–65; Aston, Harrell, and Shaw 2000, 50–53; Lucas 1948, 459–60.

Turquoise

For the Late Middle Kingdom, at Tell el-Dab'a,³ Harageh,⁴ and Lisht⁵ turquoise beads have been found, while at Dahshur⁶ and Lahun⁷ both beads and scarabs of turquoise have been found. Harageh has most turquoise beads and has a few types in common with the other sites, especially Tell el-Dab'a. For the Early Second Intermediate Period, turquoise beads have been excavated at Tell el-Dab'a,⁸ mostly, and at Harageh.⁹ However, there are no types shared. For the Late Second Intermediate Period, turquoise beads have been retrieved only from three tombs in Tell el-Dab'a.¹⁰

Rock crystal

Rock crystal beads have been discovered in tombs of the Late Middle Kingdom in Tell el-Dab'a,¹¹ while one rock crystal scarab has been recorded in one context of the Early Second Intermediate Period at Tell el-Dab'a.¹² Rock crystal beads come mostly from tombs of the Late Second Intermediate Period in Tell el-Dab'a,¹³ and in one context respectively in Tell el-Maskhuta,¹⁴ Balabish,¹⁵ and the Theban area¹⁶. Tell el-Dab'a has the greater variety of types, while the other sites only have one type, which they share with Tell el-Dab'a.

Contacts with the Sinai

Tell el-Dab'a was likely the point where the described materials entered Egypt. This is suggested by different elements. Firstly, the geographical position of Tell el-Dab'a, in the Eastern Delta, makes it a favourable point to enter Egypt from the Sinai through land routes. The site was connected to the so-called 'Ways of Horus',¹⁷ namely the land route that led from Egypt to the Sinai; this

3 Schiestl 2009, 98, 360.

4 Engelbach and Gunn 1923, 9–13 and pls. L–LIII.

5 Kemp, Merrillees, and Edel 1980, 220–25.

6 De Morgan et al. 1895, 62; Oppenheim 1996, 26.

7 Petrie, Brunton, and Murray 1923, 13–15, pls. XLVIII and LXIII; Winlock 1934, 22, 30–41, 55.

8 Forstner-Müller 2008, 140–91.

9 Engelbach and Gunn 1923, 9–13 and pls. L–LIII.

10 Forstner-Müller 2008, 299–332 and 343–84.

11 Bietak, Mlinar, and Schwab 1991, 33; Forstner-Müller 2008, 129–40.

12 Forstner-Müller 2008, 189–90; Mlinar 2001b, n. 211.

13 Bietak, Mlinar, and Schwab 1991, 214; Forstner-Müller 2008, 221–41; Forstner-Müller et al. 2015, 35–39.

14 Redmount 1989.

15 Wainwright and Whittemore 1920, 8–16 and 19–23, pls. VIII and XVI–XVII.

16 Hayes 1959, 20–21.

17 Bietak 1996, 1.

route was dotted with military forts and camps and settlements, run by the Egyptian authorities.¹⁸ Secondly, the amount of weapons, especially swords, knives, axes, and spearheads (see Chapter 12), as well as the installations and tools uncovered at Tell el-Dab'a, including moulds and forms, kilns, tuyères (bellows) and crucibles, and metal ingots and remains,¹⁹ have shown that the site was characterized by metal (copper) working. Given that locations in the Sinai where both copper and turquoise were present are known, such as Serabit el-Khadim,²⁰ it is possible that turquoise and copper were brought together from the Sinai to the site. Thirdly, the role of people from Syria-Palestine, who were also an important part of the community at Tell el-Dab'a,²¹ in mining operations in the Sinai is known from written documents, in which Levantine names are reported in connection with these operations, and wall paintings in tombs, where people with features usually associated with the Levant in Egyptian art are shown in representations of operations in the Sinai (see Chapter 4). Lastly, Tell el-Dab'a is the only site where turquoise and rock crystal were present in contexts dating not only to the Late Middle Kingdom, but also to the entire Second Intermediate Period; hence, Tell el-Dab'a is the only site that kept receiving these materials.

As a consequence, the network of turquoise detected in the Late Middle Kingdom suggests that the material, after entering Egypt through Tell el-Dab'a, was distributed in the Memphis-Fayyum area, where the capital of the time was located.²² This implies that the royal family, the members of the royal court, and other rich inhabitants of the area had the means to acquire turquoise, as demonstrated by both royal and non-royal tombs in Dahshur, Lahun, Lisht, and Harageh.²³ Turquoise was present also during the Early Second Intermediate Period in Harageh. This shows that there was still an elite class present in the Memphis-Fayyum area, and that trade between the area and Tell el-Dab'a still happened; this has already been suggested on the basis of other objects, such as pottery made of fabrics found in the Memphis-Fayyum area and excavated at Tell el-Dab'a,²⁴ and Tell el-Yahudiyah ware found at Harageh.²⁵ Moreover, it has also been suggested that a ruling class, namely the last part of the Thirteenth Dynasty, was still present in the area

18 As described in: Oren 1987.

19 Bietak and Forstner-Müller 2006; Philip 1995a; Philip 1995b; Philip 2006, 169–203.

20 Beit-Arie 1985; Lucas 1948, 228–36; Ogden 2000, 149–55.

21 Main summary on the history of Levantine presence in Tell el-Dab'a is in: Bietak 1996.

22 Agut and Moreno-García 2016, 249–53; Quirke 2005.

23 Di. Arnold 1996; Arnold et al. 1992; Baba and Yazawa 2015; Brunton 1920; De Morgan, Legrain, and Jéquier 1903; De Morgan et al. 1895; Grajetzki 2004; Petrie, Brunton, and Murray 1923; Winlock 1934.

24 Aston, Bader, and Kunst 2009.

25 Aston and Bietak 2012, 169 and 553.

(see Chapter 2): the results of the analysis support this theory. During the Late Second Intermediate Period, turquoise was present only at Tell el-Dab'a and was not transported further into Egypt: this can be due to the fact the other sites did not have the resources necessary to acquire expensive materials such as turquoise. This is confirmed also by the fact that precious materials, such as imported stones and gold, are not common in Egypt at the time and are found only in richer tombs, as shown further in this chapter.

There are good reasons to assume that during the Late Middle Kingdom turquoise was transported as raw material to the Memphis-Fayyum area and worked locally. Firstly, there are more types of turquoise objects, both beads and scarabs, in the Memphis-Fayyum area than at Tell el-Dab'a. Secondly, the two areas have one type of bead in common, suggesting workshops in either region worked according to local traditions or tastes. Lastly, in the Memphis-Fayyum area was the location of the capital and of the royal workshops where, as shown for example by the pottery,²⁶ the style of the material culture was produced. During the Early Second Intermediate Period, turquoise was worked according to local traditions both at Tell el-Dab'a and Harageh. This is suggested by the fact that the two sites have no types of turquoise beads in common, and by the fact that Harageh was an important site, as demonstrated by the present analysis, where an elite class was still present, as shown by the burials and as mentioned above;²⁷ therefore, people buried at Harageh likely had the means to work turquoise locally.

Concerning rock crystal, the network detected shows that it reached further south than Tell el-Dab'a only during the Late Second Intermediate Period. This was probably allowed by the fact that, during that time, rock crystal arrived also from the Western Desert: this is supported by the contacts between Tell el-Dab'a and the oases, demonstrated by the analysis conducted in the present work and discussed in the conclusions. It is possible that rock crystal was worked at Tell el-Dab'a and transported as finished goods. This is suggested by the fact that not only Tell el-Dab'a has the majority, and the larger variety, of beads of this material, but also that the other sites share the only type of bead that they have with Tell el-Dab'a. Moreover, rock crystal objects are present outside Tell el-Dab'a only during the Second intermediate Period, when the site was a capital, and therefore an independent and thriving site with the means to produce and distribute rock crystal objects, contrarily to when it was controlled by the capital during the Late Middle Kingdom (refer to Chapters 2 and 14 for discussions on the historical framework). Hence, during the Second Intermediate Period finished objects of rock crystal found

26 For the style of the Middle Kingdom: Wodzińska 2009.

27 Grajetzki 2004.

their way from Tell el-Dab'a not only to the Eastern Delta, but also to southern Upper Egypt, witnessing contacts between the Hyksos and the Theban rulers.

LITHIC MATERIALS FROM CENTRAL-SOUTHERN EGYPT

Both in the central and southern parts of Egypt, along the Nile Valley and in the Eastern Desert, were found steatite (numbers 23, 27, 28, 33, 43 on Map 1),²⁸ calcite-alabaster (numbers 7, 11, 32 on Map 1),²⁹ diorite (number 17 on Map 1),³⁰ and amethyst (15, 21, 36 on Map 1).³¹ Though haematite occurred widely in Egypt, the only sources where it could be extracted are known only in the central and southern parts of the Eastern Desert (numbers 14, 16 20, 26 on Map 1).³²

Amethyst

Amethyst beads have been found at nearly all the sites included in the analysis of the Late Middle Kingdom. For the same period, most of the amethyst scarabs has been excavated at Dahshur,³³ Abydos,³⁴ and Hu.³⁵ Other sites include Tell el-Dab'a,³⁶ Lahun,³⁷ Qasr el-Sagha,³⁸ Matmar,³⁹ Qau el-Kebir,⁴⁰ the Theban area,⁴¹ Nubt,⁴² Esna,⁴³ and Edfu.⁴⁴ The sites have no types of amethyst scarabs in common, but the types of amethyst beads they do have in common focus on the sites in Middle and Upper Egypt.

Amethyst beads of the Early Second Intermediate Period have been retrieved from Tell el-Dab'a⁴⁵ and Qau el-Kebir,⁴⁶ which share more types, as well as

- 28 B.G. Aston 1994, 59–60; Aston, Harrell, and Shaw 2000, 58–59; Lucas 1948, 479–80.
- 29 B.G. Aston 1994, 42–47; Aston, Harrell, and Shaw 2000, 59–60; Lucas 1948, 447–48.
- 30 B.G. Aston 1994, 13–15; Aston, Harrell, and Shaw 2000, 30–31; Lucas 1948, 465–67.
- 31 B.G. Aston 1994, 66–67; Aston, Harrell, and Shaw 2000, 50–52; Lucas 1948, 445.
- 32 B.G. Aston 1994, 73; Aston, Harrell, and Shaw 2000, 38; Lucas 1948, 452.
- 33 Ben-Tor 2004, figs. 2, 6; Ben-Tor 2007, 30–37; De Morgan et al. 1895, 62; Keel 1989, 285; Oppenheim 1995, 10–11; Oppenheim 1996, 26; Tufnell, Martin, and Ward 1984, pl. 52.
- 34 Ayrton et al. 1904; Garstang, Newberry, and Milte 1901, 11, 44.
- 35 Bourriau 2009, 59; Petrie and Mace 1901, 43–44.
- 36 Mlinar 2001b, n. 18; Schiestl 2009, 375.
- 37 Petrie, Griffith, and Newberry 1890, 29.
- 38 Śliwa 1992a, 184; Śliwa 1992b, 32.
- 39 Brunton 1948, 54 and pl. LXIX.
- 40 Brunton, Gardiner, and Petrie 1930, 1.
- 41 Loyrette, Nasr, and Bassiouni 1994, 116–18.
- 42 Ben-Tor 2007, 29; Petrie, Quibell, and Spurrell 1896, 66 and pl. LXXXI.
- 43 Downes 1974, 63.
- 44 Michałowski et al. 1939, 31–33.
- 45 Forstner-Müller 2008, 140–217.
- 46 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. V–VIII, XI, XXIV–XXV and XXXII.

Harageh⁴⁷ and Ain Asil.⁴⁸ The only amethyst scarab mentioned in the publications for this period is from Tell el-Dab'a.⁴⁹ Amethyst beads of the Late Second Intermediate Period have been discovered at Tell el-Dab'a,⁵⁰ Tell el-Retaba,⁵¹ Tell el-Maskhuta.⁵² Sedment,⁵³ Matmar,⁵⁴ Mostagedda,⁵⁵ Qau el-Kebir,⁵⁶ Hu,⁵⁷ and the Theban area.⁵⁸ Amethyst scarabs of the same period have been recorded mostly from Tell el-Dab'a⁵⁹ and Tell el-Maskhuta,⁶⁰ as well as from Tell el-Yahudiyah,⁶¹ Matmar,⁶² Qau el-Kebir,⁶³ Hu,⁶⁴ and the Theban area.⁶⁵ There are no types of amethyst scarabs in common between the sites. However, the types of amethyst beads in common between the sites connect Tell el-Dab'a with Sedment, Mostagedda, and Qau el-Kebir; they link the last two sites as well.

Calcite-alabaster

During the Late Middle Kingdom, calcite-alabaster vessels have been reported from nearly all the sites included in the analysis. The types in common con-

- 47 Engelbach and Gunn 1923, 9–13 and pls. L–LIII.
- 48 Marchand, Soukiassian, and Bourriau 2010, 301–4 and 308.
- 49 Forstner-Müller 2008, 180–81.
- 50 Bietak, Mlinar, and Schwab 1991, 172–274; Forstner-Müller 2008, 221–384; Forstner-Müller et al. 2015, 35–39.
- 51 Rzepka et al. 2014, 39–46.
- 52 Redmount 1989.
- 53 Petrie & Brunton, 1924, 16–21 and pls. XLVI–XLVII.
- 54 Brunton 1948, 56–58 and pls. XLIV, LXXIII.
- 55 Brunton and Morant 1937, 114–22 and 125–26, pls. LXVIII–LXXII.
- 56 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. V–VIII, XI, XXIV–XXV, XXXII.
- 57 Petrie and Mace 1901, 46, 51, 53.
- 58 Hayes 1959, 20–21.
- 59 Bietak, Mlinar, and Schwab 1991, 170–80; Forstner-Müller 2008, 277–80, 322–25; Mlinar 2001b, ns. 504–5, 513, 522, 605, 616–17.
- 60 Ben-Tor 2007, 97.
- 61 Griffith 1890, 39 and pl. X.
- 62 Brunton 1948, 56.
- 63 Brunton, Gardiner, and Petrie 1930, 12 and pl. XIX.
- 64 Ben-Tor 2007, 92–93; Bourriau 2009, 82; Petrie and Mace 1901, pl. XLI.
- 65 Winlock 1924, 258.

nect mainly Dahshur,⁶⁶ Harageh,⁶⁷ Rifeh,⁶⁸ Riqqeh,⁶⁹ Abydos,⁷⁰ Hu,⁷¹ Esna,⁷² Edfu,⁷³ hence sites of the Memphis-Fayyum area and sites in southern Upper Egypt.

During the Early Second Intermediate Period, calcite-alabaster vessels have been unearthed at all the sites included in the analysis. The types in common connect mainly Tell el-Dab'a⁷⁴ and Edfu,⁷⁵ as well as the latter and Abydos⁷⁶ and, through this, Tod.⁷⁷ During the Late Second Intermediate Period, calcite-alabaster vessels have been recovered from nearly all the sites included in the analysis. The types in common connect mainly Sedment,⁷⁸ Mostagedda,⁷⁹ Matmar,⁸⁰ and Qau el-Kebir,⁸¹ thus the sites in Middle Egypt; these sites function also as bridges between the sites in Lower Egypt and the ones in southern Upper Egypt.

Diorite

Diorite beads have been recovered only from contexts of the Late Middle Kingdom in Esna⁸² and Armant,⁸³ while diorite vessels have been found in contexts of the Late Middle Kingdom in Esna⁸⁴ and Edfu,⁸⁵ from respectively

- 66 B.G. Aston 1994, 142, 145; De Morgan, Legrain, and Jéquier 1903, 48–68 and 74–77; De Morgan et al. 1895, 63, 71–75 and 96–114.
- 67 B.G. Aston 1994, 142–45; Engelbach and Gunn 1923, 16–17 and pl. XLVII.
- 68 B.G. Aston 1994, 142–43; Petrie, Thompson, and Crum 1907, 13 and pl. XIA.
- 69 B.G. Aston 1994, 144; Engelbach et al. 1915, 13 and 16, pls. VII and XIII.
- 70 B.G. Aston 1994, 141–46; Ayrton et al. 1904, 19, 47 and pl. XI; Garstang, Newberry, and Milte 1901; Kemp, Merrillees, and Edel 1980, 124–26; Peet and Loat 1913, 24–27; Petrie et al. 1925, pl. XXX; Randall-MacIver, Mace, and Griffith 1902, 55; Tooley 2015.
- 71 B.G. Aston 1994, 141–45; Bourriau 2009, 52–53, 55–57, 59, 61–63, 67, 69, 71, 73, 75–81, and 83–90; Petrie and Mace 1901, 44 and pl. XXVIII–XXX.
- 72 B.G. Aston 1994, 141–46; Downes 1974, 96–99.
- 73 B.G. Aston 1994, 143–46; Michałowski et al. 1939, 46–49 and pls. XX–XXI; Michałowski et al. 1950, 177–82 and pls. XVIII–XX.
- 74 Bietak, Mlinar, and Schwab 1991, 43; Forstner-Müller 2008, 140–217; S.E.M. Müller 2013, 120.
- 75 Michałowski et al. 1950, 177–82, pls. XVIII and XX.
- 76 B.G. Aston 1994, 142–44; Garstang, Newberry, and Milte 1901; Peet 1914, 57–64; Randall-MacIver, Mace, and Griffith 1902, 67 and 97–101.
- 77 Barguet 1952, 19–21 and 29.
- 78 Petrie and Brunton 1924, 16–21 and pl. XLI.
- 79 B.G. Aston 1994, 146–47; Brunton and Morant 1937, 114–22 and 128–29, pl. LXVIII.
- 80 B.G. Aston 1994, 147; Brunton 1948, 56–58 and pl. XLII.
- 81 B.G. Aston 1994, 146–47; Brunton, Gardiner, and Petrie 1930, 3–10 and pls. XX–XXI.
- 82 Downes 1974, 50–55 and Tomb catalogue.
- 83 Mond and Myers 1937.
- 84 B.G. Aston 1994, 141–46; Downes 1974, 96–99.
- 85 Michałowski et al. 1939, 46–49 and pls. XX–XXI; Michałowski et al. 1950, 177–82 and pls. XVIII–XX.

two tombs and one tomb. However, as far as both the beads and the vessels are concerned, there are no types in common between the sites.

Haematite

For the Late Middle Kingdom, haematite beads come mostly from Armant,⁸⁶ as well as from Harageh⁸⁷ El-Kab,⁸⁸ and Edfu,⁸⁹ hence only from Middle and southern Upper Egypt. Based on the types in common, the sites in southern Upper Egypt share strong connections. For the Early Second Intermediate Period, one haematite vessel has been uncovered in one tomb in Tell el-Dab'a.⁹⁰ For the Late Second Intermediate Period, only one type of haematite bead has been reported from both Mostagedda⁹¹ and Qau el-Kebir.⁹²

Steatite

Concerning the Late Middle Kingdom, steatite beads have been unearthed at Harageh,⁹³ Mostagedda,⁹⁴ Qau el-Kebir,⁹⁵ Abydos,⁹⁶ Armant,⁹⁷ and Esna,⁹⁸ while steatite vessels have been recovered from Lisht⁹⁹ and Harageh,¹⁰⁰ in one tomb at each site. Moreover, steatite scarabs have been found at nearly all the sites examined for this chronological phase. There are no types of vessels in common between the sites. However, the types of beads and scarabs in common connect mainly sites in the Memphis-Fayyum area and in Middle Egypt, which share strong connections with sites in southern Upper Egypt.

With respect to the Early Second Intermediate Period, only steatite scarabs have been excavated at Tell el-Dab'a¹⁰¹ and Ain Asil,¹⁰² which do not share types. Regarding the Late Second Intermediate Period, steatite beads have

86 Mond and Myers 1937.

87 Engelbach and Gunn 1923, 9–13 and pls. L–LIII.

88 Quibell, Clarke, and Tylor 1898, 15.

89 Michałowski et al. 1939, 31–33, 126, 130–31; Michałowski et al. 1950, 183–84, 312.

90 Forstner-Müller 2008, 169–72.

91 Brunton and Morant 1937, 114–22 and 125–26, pls. LXVIII–LXXII.

92 Brunton, Gardiner, and Petrie 1930, 3–10, pls. V–VIII, XI, XXIV–XXV and XXXII.

93 Engelbach and Gunn 1923, 9–13 and pls. L–LIII.

94 Brunton and Morant 1937, 113–14 and pl. LXXI.

95 Brunton, Gardiner, and Petrie 1930, 1–3, pls. II and IV.

96 Garstang, Newberry, and Milte 1901; Tooley 2015.

97 Mond and Myers 1937.

98 Downes, 1974, 50–55 and Tomb catalogue.

99 Lansing and Hayes 1934.

100 Engelbach and Gunn 1923, 16–17 and pl. XLVII.

101 Ben-Tor 2007, 89; Bietak, Mlinar, and Schwab 1991, 46–89; Forstner-Müller 2008, 143–90; Mlinar 2001b, ns. 201–307.

102 Marchand 2003, 305–7.

been retrieved mostly from Tell el-Dab'a,¹⁰³ as well as Qau el-Kebir¹⁰⁴ Tell el-Maskhuta,¹⁰⁵ Lisht,¹⁰⁶ Matmar,¹⁰⁷ and Mostagedda.¹⁰⁸ Moreover, steatite scarabs have been discovered at nearly all the sites examined for this chronological phase. This distribution shows that steatite objects of this period, both beads and scarabs, were present mostly in Lower and Middle Egypt. The types shared connect more strongly the sites in Middle Egypt and in the Memphis-Fayyum area with the sites in Lower Egypt.

Contacts with central-southern Egypt

The fact that for the Late Middle Kingdom objects of these materials, whose sources were both in the central and southern parts of Egypt, come from sites in Middle and southern Upper Egypt, which are geographically near the sources, is not surprising. These materials also reached the Memphis-Fayyum area: this can be explained by the fact that this was the area of the capital of the time and its inhabitants had the resources necessary to get the materials, as discussed above.

The types of beads and scarabs in common create stronger connections for the sites in the Memphis Fayyum area and in Middle Egypt. This suggests that the types were mostly produced there, especially as far as more prestigious objects and materials are concerned, or that the mentioned sites set the styles followed in other areas of Egypt. This theory is also supported by the fact that a unified style, produced in royal workshops in the capital in the Memphis-Fayyum area, is known from other objects, as discussed above. The capital area had more contacts with southern Upper Egypt than Lower Egypt. Many prominent sites where administrative tasks – e.g. the inspecting, storing and transferral of commodities and goods stored in wooden boxes, baskets, and ceramic jars, and documenting these processes on papyri and ostraca – and cultic activities were performed were located in southern Upper Egypt. These sites were not only located near the resources in question, but also played an important role in their circulation. These sites include Abydos (where temples were built, such as the mortuary one of Senwosret III; several seal impressions witness the completion of the administrative activities mentioned earlier),¹⁰⁹ Esna (whose importance is shown by its large cemetery

103 Forstner-Müller 2008, 241–332; Forstner-Müller et al. 2015, 35–39.

104 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. V–VIII, XI, XXIV–XXV and XXXII.

105 Redmount 1989.

106 Hayes 1959, 12–13.

107 Brunton 1948, 56–58, pls. XLIV and LXXIII.

108 Brunton and Morant 1937, 114–22, 125–26 and pls. LXVIII–LXXII.

109 Wegner 1998; Wegner 2001; Wegner 2004; Wegner 2010; Wegner, Smith, and Rossell 2000.

with tombs accompanied by stelae, and by a chapel of Senwosret I),¹¹⁰ Edfu (where a large cemetery and a large complex with many seal impressions have been uncovered),¹¹¹ and Elephantine (where a large settlement and many seal impressions have been unearthed).¹¹² Lastly, contacts likely happened largely via the Nile (where most sites detected as major ones in the present analysis are located), but also through the oases, as demonstrated by the role of bridging site detected for Ain Asil: these results are further discussed in the conclusions.

During the Early Second Intermediate Period, objects of the materials discussed in this section have been recorded nearly exclusively from sites in Lower and Middle Egypt, with few instances in Ain Asil and southern Upper Egypt. The sites in Lower and Middle Egypt are also the ones more connected through the types of beads and scarabs in common, even though connections are overall weak, and even weaker with the sites in southern Upper Egypt. Nevertheless, this pattern suggests that the materials come from the central part of Egypt. This can be because, given the political divisions of the time, the southern part was not easy to access for the sites in northern Egypt, and communications were overall difficult. Lastly, the fact that Tell el-Dab'a is the site that shares the larger number of types also suggests that the material could be worked and distributed from there; this is also suggested by the major role detected for the site, which seem to be flourishing at the time.

During the Late Second Intermediate Period, objects of the materials discussed in this section were present also in southern Upper Egypt but have been reported mostly from sites in Middle and Lower Egypt, which also share the larger number of types. Therefore, the circulation of objects of these materials passed by the sites in Middle Egypt, like in the previous periods, but its focus switched from Upper to Lower Egypt; this suggests that, at the time, the sources in the central part of Egypt were more exploited than the ones in its southern part. This theory is also supported by the role detected for the sites in Middle Egypt during this period and the importance they acquired probably because, as discussed in the conclusions, the communities of the Pan-grave culture occupying those sites played a role, directly or indirectly, in acquiring and circulating the materials.

110 Downes 1974; El-Saghir 1999; Liszka 2012a.

111 Bruyère et al. 1938; Michałowski et al. 1939; Michałowski et al. 1950; Moeller 2009; Moeller 2010; Moeller 2012; Moeller, Marouard, and Ayers 2011.

112 Von Pilgrim 1996.

LITHIC MATERIALS FROM SOUTHERN EGYPT

Sources for anhydrite (numbers 12, 32, 37 on Map 1),¹¹³ feldspar (numbers 27 and 31 on Map 1),¹¹⁴ jasper (number 22 on Map 1),¹¹⁵ marble (numbers 14 and 41 on Map 1),¹¹⁶ and serpentine (numbers 19, 27, 29, 33, 42 on Map 1)¹¹⁷ were in the southern part of Egypt, especially in the Eastern Desert. Siltstone was also found in the Eastern Desert, in its lower and central part, although mines are known only in the southern part.¹¹⁸

Anhydrite

In contexts of the Late Middle Kingdom, anhydrite vessels have been uncovered at Matmar,¹¹⁹ Qau el-Kebir,¹²⁰ Abydos,¹²¹ Esna,¹²² Denderah,¹²³ and Edfu.¹²⁴ In contexts of the Late Second Intermediate Period, anhydrite vessels have been unearthed at Mostagedda,¹²⁵ Qau el-Kebir,¹²⁶ Abydos,¹²⁷ the Theban area,¹²⁸ and Balabish.¹²⁹ For both periods, the sites do not have any types in common.

- 113 B.G. Aston 1994, 51–53; Aston, Harrell, and Shaw 2000, 22–23; Lucas 1948, 470–71.
- 114 Aston, Harrell, and Shaw 2000, 45–46; Lucas 1948, 450–51.
- 115 B.G. Aston 1994, 69–71; Aston, Harrell, and Shaw 2000, 29–30; Lucas 1948, 454–55.
- 116 B.G. Aston 1994, 55–56; Aston, Harrell, and Shaw 2000, 44–45; Lucas 1948, 472–73.
- 117 B.G. Aston 1994, 56–59; Aston, Harrell, and Shaw 2000, 56–57; Lucas 1948, 479–80.
- 118 B.G. Aston 1994, 28–32; Aston, Harrell, and Shaw 2000, 57–58; Lucas 1948, 477–79.
- 119 Brunton 1948, 54–56 and pl. XLII.
- 120 B.G. Aston 1994, 142–44; Brunton, Gardiner, and Petrie 1930, 1–3 and pl. III.
- 121 B.G. Aston 1994, 141–46; Garstang, Newberry, and Milte 1901; Peet and Loat 1913, 24–27.
- 122 B.G. Aston 1994, 141–46; Downes 1974, 96–99.
- 123 Petrie and Griffith 1900, 25–26 and pl. XX.
- 124 Michałowski et al. 1950, 177–82 and pls. XVIII–XX.
- 125 Brunton and Morant 1937, 114–22 and 128–29, pl. LXVIII.
- 126 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. XX–XXI.
- 127 B.G. Aston 1994, 142–44; Peet 1914, 57–64; Randall-MacIver, Mace, and Griffith 1902, 67 and 97–101.
- 128 Petrie and Walker 1909, 7–8, 11.
- 129 Wainwright and Whittemore 1920, 8–12 and 33, pl. XIII.

Feldspar

For the Late Middle Kingdom, feldspar beads have been excavated at Dahshur,¹³⁰ Harageh,¹³¹ Hawara,¹³² Ain Asil,¹³³ Lahun,¹³⁴ Riqqeh,¹³⁵ Matmar,¹³⁶ Mostagedda,¹³⁷ Abydos,¹³⁸ Ballas,¹³⁹ Armant,¹⁴⁰ Esna,¹⁴¹ El-Kab,¹⁴² and Edfu.¹⁴³ Feldspar scarabs of the same chronological phase have been retrieved from Dahshur,¹⁴⁴ Lisht,¹⁴⁵ Lahun,¹⁴⁶ and Esna.¹⁴⁷ Hence, feldspar is not found more north than the Memphis-Fayyum area. While there are no types of scarabs in common between the sites, the types of beads in common are mostly among the sites in the Memphis-Fayyum area and between them and Abydos.

For the Early Second Intermediate Period, feldspar beads have been discovered at Harageh¹⁴⁸ and Edfu,¹⁴⁹ but there are no types in common between the sites. For the Late Second Intermediate Period, feldspar beads have been recorded at Tell el-Dab'a,¹⁵⁰ Lisht,¹⁵¹ Balabish,¹⁵² Mostagedda,¹⁵³ and Qau el-Kebir,¹⁵⁴ thus in Lower and Middle Egypt. One feldspar scarab of the same period comes from Mostagedda.¹⁵⁵ The types of beads in common connect Tell el-Dab'a with Balabish, and this latter with Mostagedda.

- 130 De Morgan, Legrain, and Jéquier 1903, 48–68, 74; De Morgan et al. 1895, 61–68, 91–114.
- 131 Engelbach and Gunn 1923, 9–13 and pls. L–LIII.
- 132 Farag and Iskandar 1971, 34–40; Petrie, Wainwright, and Mackay 1912, 35–36.
- 133 Aufrère and Ballet 1990, 10–13.
- 134 Brunton 1920, 12–17, 22–41; Petrie, Brunton, and Murray 1923, 13–15, pls. XLVIII and LXIII; Winlock 1934, 22, 30–41.
- 135 Engelbach et al. 1915, 13–14 and pls. XL–XLIII.
- 136 Brunton 1948, 54–56, pls. XLIII and LXXIII.
- 137 Brunton and Morant 1937, 113–14 and pl. LXXI.
- 138 Peet 1914, 54; Peet and Loat 1913, 24–28.
- 139 Petrie, Quibell, and Spurrell 1896, 2, 8.
- 140 Mond and Myers 1937.
- 141 Downes 1974, 50–55 and Tomb catalogue.
- 142 Quibell, Clarke, and Tylor 1898, 15.
- 143 Michałowski et al. 1950, 183–84, 312.
- 144 De Morgan et al. 1895, 69.
- 145 Lansing 1924, 41; Martin 1971, ns. 642, 1619.
- 146 Winlock 1934, 55.
- 147 Downes 1974, 60–62.
- 148 Engelbach and Gunn 1923, 9–13 and pls. L–LIII.
- 149 Michałowski et al. 1950, 183–84 and 312.
- 150 Forstner-Müller et al. 2015, 35–39.
- 151 Hayes 1959, 12–13.
- 152 Wainwright and Whittemore 1920, 8–16 and 19–23, pls. VIII and XVI–XVII.
- 153 Brunton and Morant 1937, 114–22 and 125–26, pls. LXVIII–LXII.
- 154 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. V–VIII, XI, XXIV–XXV and XXXII.
- 155 Brunton and Morant 1937, 113–14 and pl. LXIX.

Jasper

Jasper beads have been uncovered in contexts of the Late Middle Kingdom in Tell el-Dab'a,¹⁵⁶ Lahun,¹⁵⁷ Harageh,¹⁵⁸ the Theban area,¹⁵⁹ Esna,¹⁶⁰ El-Kab,¹⁶¹ and Elephantine,¹⁶². Furthermore, jasper scarabs of the same period have been reported from Lisht,¹⁶³ Hu,¹⁶⁴ and Nubt.¹⁶⁵ The sites have no types of scarabs in common, whereas the types of beads they have in common link Esna with the Theban area and this latter with Tell el-Dab'a and Harageh. For the Late Second Intermediate Period, jasper scarabs have been unearthed at Rifeh,¹⁶⁶ Mostagedda,¹⁶⁷ and the Theban area.¹⁶⁸

Marble

Vessels of marble have been recovered from two tombs of the Late Middle Kingdom in Harageh.¹⁶⁹

Serpentine

For the Late Middle Kingdom, serpentine beads have been excavated only at Harageh,¹⁷⁰ while serpentine vessels have been discovered in two tombs in Harageh¹⁷¹ and in one tomb in Edfu.¹⁷² For the Early Second Intermediate Period, serpentine vessels have been recorded in one tomb in Abydos.¹⁷³ For the Late Second Intermediate Period, serpentine beads and scarabs come from Tell el-Dab'a,¹⁷⁴ while serpentine vessels have been uncovered at Tell el-

156 Schiestl 2009, 436–40.

157 Petrie, Brunton, and Murray 1923, 13–15, pls. XLVIII and LXIII.

158 Engelbach and Gunn 1923, 9–13 and pls. L–LIII.

159 Anthes 1943, 10–12.

160 Downes 1974, 50–55 and Tomb catalogue.

161 Quibell, Clarke, and Tylor 1898, 15.

162 Von Pilgrim 1996, 320.

163 Martin 1971, ns. 195–196.

164 Bourriau 2009, 59; Petrie and Mace 1901, 44.

165 Petrie, Quibell, and Spurrell 1896, 66 and pl. LXXX.

166 Petrie, Thompson, and Crum 1907, 20–21 and pl. XXIII.

167 Brunton and Morant 1937, 113–14 and pl. LXIX.

168 Winlock 1924, 231–32.

169 Engelbach and Gunn 1923, 16–17 and pl. XLVII.

170 Engelbach and Gunn 1923, 9–13 and pls. L–LIII.

171 B.G. Aston 1994, 142–45; Engelbach and Gunn 1923, 16–17 and pl. XLVII.

172 B.G. Aston 1994, 143–46; Michałowski et al. 1939, 46–49 and pls. XX–XXI.

173 Garstang, Newberry, and Milte 1901.

174 Bietak, Mlinar, and Schwab 1991, 177–80 and 267–68; Forstner-Müller et al. 2015, 35–39; Hein, Jánosi, and Kopetzky 2004, 339–52; Mlinar 2001b, ns. 512, 908.

Dab'a,¹⁷⁵ Sedment,¹⁷⁶ and the Theban area,¹⁷⁷ from one tomb respectively. For both periods, there are no types in common between the sites, for any of the objects mentioned.

Siltstone

Only one type of siltstone bead and one type of siltstone scarab are included in the present research, from two contexts of the Late Middle Kingdom, respectively in Edfu¹⁷⁸ and in Nubt.¹⁷⁹ For the same period, siltstone vessels have been reported from Edfu.¹⁸⁰ Siltstone vessels have been unearthed also in one tomb of the Early Second Intermediate Period in Ain Asil¹⁸¹ and in contexts of the Late Second Intermediate Period in Tell el-Dab'a.¹⁸²

Contacts with southern Egypt

Considering the location of the sources, in southern Egypt, it comes as no surprise to find objects made of the aforementioned materials mostly at sites in southern Upper Egypt, which are in geographical proximity and had administrative and religious importance, as discussed above. It is also not surprising that such objects were often present also in Late Middle Kingdom contexts in the Memphis-Fayyum area, because it was the area of capital and, as such, the people living there had the means to get the materials, as discussed above.

Rarely, objects of the materials discussed in this section were present also in Lower Egypt. During the Late Middle Kingdom, the fact that these objects have been often excavated in the Memphis-Fayyum area suggests that the materials passed by there on their way from Upper to Lower Egypt. Concerning the Second Intermediate Period, the fact that these objects have been retrieved from both the Memphis-Fayyum area, the Dakhla Oasis, and the sites in Middle Egypt suggests that, at that time, the materials reached Lower Egypt by travelling through both the desert and the Nile Valley. The materials discovered in Dakhla Oasis and dated to the Early Second Intermediate Period further suggest that the desert route was active at this time.

During the Early Second Intermediate Period, among the materials available in the southern part of Egypt, only the ones, such as feldspar and siltstone and serpentine, which were more available along the main wadis, namely

175 Bietak, Mlinar, and Schwab 1991, 123–31, 177–80, 201.

176 Petrie and Brunton 1924, 16–21 and pl. XLI.

177 Petrie and Walker 1909, 7–8, II.

178 Michałowski et al. 1939, 31–33, 126, 130–31.

179 Ben-Tor 2007, 93–94; Petrie, Quibell, and Spurrell 1896, 66 and pl. LXXXI.

180 Michałowski et al. 1950, 177–82 and pls. XVIII–XX.

181 Marchand, Soukiasian, and Bourriau 2010, 293–96.

182 Forstner-Müller 2008, 343–84; Forstner-Müller et al. 2015, 43.

the Wadi Hammamat and the Wadi Barramiya, were used. These wadis respectively led from Koptos and Edfu to the Eastern Desert. The importance of these sites is also shown by the large number of scarabs of the Second Intermediate Period excavated there,¹⁸³ though these scarabs could not be included in the present analysis because their dating and/or the types to which they belonged were not clear from the publications. Therefore, the materials located deeper into the desert were not exploited. Moreover, no connections can be detected through materials from the southern part of Egypt because no objects of these materials are shared. All this suggest that in the Early Second Intermediate Period there no networks to exchange materials from southern Upper Egypt, especially when it came to bring them to Lower Egypt.

The situation changed slightly during the Late Second Intermediate Period, when materials from southern Egypt reached Lower Egypt. Nevertheless, only Tell el-Dab'a, Balabish, and Mostagedda share types of objects of these materials. Considering the presence of communities of Pan-grave culture, or at least of Nubian origins, at the sites,¹⁸⁴ it is possible that these communities played a role in their circulation.

The question is whether the materials from southern Egypt were transported as raw materials or as finished goods, both during the Late Middle Kingdom and the entire Second Intermediate Period. The fact that the sites generally do not share many types during neither of the chronological phases examined, suggests that the materials were transported raw and worked into finished goods locally. Only types of feldspar beads during the Late Middle Kingdom are more shared. Nevertheless, the connections are mostly inside the Memphis-Fayyum area: this still points to a localized production.

COMMON LITHIC MATERIALS IN EGYPT

The following subsections each deal with common types of lithic materials: agate, basalt, carnelian, garnet, limestone, quartz, and sedimentary quartzite. The final subsection discusses the evidence for contacts based on an analysis of these materials.

Agate

Agate could be found in form of pebbles, even though it is found also with haematite mines (number 20 on Map 1).¹⁸⁵ Agate beads have been recovered from

183 Moeller 2012; Moeller, Marouard, and Ayers 2011; Petrie 1896.

184 For Balabish: Wainwright 1920. For Tell el-Dab'a: Aston and Bietak 2017; Forstner-Müller and Rose 2012. For Mostagedda: Brunton and Morant 1937.

185 B.G. Aston 1994, 68–69; Aston, Harrell, and Shaw 2000, 26; Lucas 1948, 442–43.

contexts of the Late Middle Kingdom at Tell el-Dab'a,¹⁸⁶ Lahun,¹⁸⁷ Armant,¹⁸⁸ and Esna;¹⁸⁹ only Tell el-Dab'a and Armant have one type in common. For the Late Second Intermediate Period, agate beads have been found only at Tell el-Dab'a¹⁹⁰ and Lisht.¹⁹¹ However, the two sites do not share any type.

Basalt

Basalt had numerous sources, though the only known quarry is in the Fayyum (numbers 6 and 9 on Map 1).¹⁹² Beads and one vessel of basalt of the Late Middle Kingdom have respectively been excavated at Harageh¹⁹³ and Denderah.¹⁹⁴ Basalt beads of the Late Second Intermediate Period have been retrieved only from Tell Hebua.¹⁹⁵

Carnelian

Carnelian could be found both in the Western Desert and in the Eastern Desert, though it was probably mined in southern Egypt (numbers 20, 38, 39 on Map 1).¹⁹⁶ For the Late Middle Kingdom, carnelian beads have been discovered at nearly all the sites included in the analysis, with the stronger connections between Dahshur,¹⁹⁷ Harageh,¹⁹⁸ Lisht,¹⁹⁹ Lahun,²⁰⁰ Riqqeh,²⁰¹ Matmar,²⁰² Qau el-Kebir,²⁰³ Hu,²⁰⁴ the Theban area,²⁰⁵ Armant,²⁰⁶ Esna,²⁰⁷ El-Kab,²⁰⁸ and Ed-

186 Schiestl 2009, 97, 418–21.

187 Petrie, Brunton, and Murray 1923, 13–15, pls. XLVIII and LXIII.

188 Mond and Myers 1937.

189 Downes 1974, 50–55 and Tomb catalogue.

190 Forstner-Müller 2008, 221–41.

191 Hayes 1959, 12–13.

192 B.G. Aston 1994, 18–21; Aston, Harrell, and Shaw 2000, 23–24; Lucas 1948, 463–64.

193 Engelbach and Gunn 1923, 9–13 and pls. L–LIII.

194 Petrie and Griffith 1900, 25–26 and pl. XX.

195 Maksoud 1998, 261.

196 B.G. Aston 1994, 67–68; Aston, Harrell, and Shaw 2000, 26–27; Lucas 1948, 448.

197 De Morgan, Legrain, and Jéquier 1903, 48–68, 74; De Morgan et al. 1895, 61–68, 91–114; Oppenheim 1996.

198 Engelbach and Gunn 1923, 9–13 and pls. L–LIII.

199 Lansing and Hayes 1934; Kemp, Merrillees, and Edel 1980, 220–25.

200 Brunton 1920, 12–17, 22–41; Petrie, Brunton, and Murray 1923, 13–15, pls. XLVIII and LXIII; Petrie, Griffith, and Newberry 1890, 22; Winlock 1934, 22, 30–41.

201 Engelbach et al. 1915, 13–14 and pls. XL–XLIII.

202 Brunton 1948, 54–56, pls. XLIII and LXXIII.

203 Brunton, Gardiner, and Petrie 1930, 1–3, pls. II and IV.

204 Bourriau 2009, 59; Petrie and Mace 1901, 42–44.

205 Anthes 1943, 10–12.

206 Mond and Myers 1937.

207 Downes 1974, 50–55 and Tomb catalogue.

208 Quibell, Clarke, and Tylor 1898, 15.

fu.²⁰⁹ For the same period, carnelian scarabs have been recorded at Dahshur,²¹⁰ Lahun,²¹¹ Esna,²¹² and the Theban area,²¹³ while one carnelian vessel come from one royal tomb of the Late Middle Kingdom in Dahshur.²¹⁴ During this phase, the Memphis-Fayyum area, Middle Egypt and the Theban area have the higher number of types of carnelian beads in common. All the carnelian scarabs are not inscribed, hence no links based on types of designs in common could be detected.

For the Early Second Intermediate Period, carnelian beads have been uncovered at nearly all the sites included in the analysis, with the higher number of types in common between Tell el-Dab'a,²¹⁵ Harageh,²¹⁶ Ain Asil,²¹⁷ Qau el-Kebir,²¹⁸ and Edfu.²¹⁹ More in detail, the connections between Tell el-Dab'a and Edfu seem to pass through Harageh, then from there both through Ain Asil and through Qau el-Kebir.

For the Late Second Intermediate Period, carnelian beads have been reported from nearly all the sites included in the analysis; the stronger connections created by the types of carnelian beads in common between the sites follow a line joining Tell el-Dab'a²²⁰ to Sedment,²²¹ to Mostagedda,²²² to Qau el-Kebir,²²³ while Abydos²²⁴ and the Theban area²²⁵ do not show strong links with the other sites. Carnelian scarabs of the same period have been unearthed mostly at Mostagedda,²²⁶ as well as Tell el-Dab'a²²⁷ and Qau el-Kebir.²²⁸ Because these

- 209 Michałowski et al. 1939, 31–33, 126 and 130–31; Michałowski et al. 1950, 183–84 and 312.
- 210 De Morgan et al. 1895, 69.
- 211 Winlock 1934, 55.
- 212 Downes 1974, 63.
- 213 Anthes 1943, 10.
- 214 B.G. Aston 1994, 142, 145; De Morgan et al. 1895, 63, 71–75 and 96–114.
- 215 Bietak, Mlinar, and Schwab 1991, 66, 71, 85–86; Forstner-Müller 2008, 140–217; S.E.M. Müller 2013, 124–26.
- 216 Engelbach and Gunn 1923, 9–13 and pls. L–LIII.
- 217 Marchand, Soukiassian, and Bourriau 2010, 301–4, 308.
- 218 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. V–VIII, XI, XXIV–XXV and XXXII.
- 219 Michałowski et al. 1939, 31–33, 126, 130–31; Michałowski et al. 1950, 183–84 and 312.
- 220 Aston, Bader, and Kunst 2009, 67–68; Bietak, Mlinar, and Schwab 1991, 116–281; Forstner-Müller 2008, 221–384; Forstner-Müller et al. 2015, 35–39; Hein, Jánosi, and Kopetzky 2004, 34–48, 100–49.
- 221 Petrie and Brunton 1924, 16–20 and pls. XLVI–XLVII.
- 222 Brunton and Morant 1937, 114–22 and 125–26, pls. LXVIII–LXXII.
- 223 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. V–VIII, XI, XXIV–XXV and XXXII.
- 224 Peet 1914, 62–64; Randall-MacIver, Mace, and Griffith 1902, 101.
- 225 Hayes 1959, 20–21.
- 226 Brunton and Morant 1937, 113–14 and pl. LXIX.
- 227 Bietak, Mlinar, and Schwab 1991, 170–75; Mlinar 2001b, n. 503.
- 228 Brunton, Gardiner, and Petrie 1930, 12 and pl. XIX.

scarabs are not inscribed, no connections based on types in common could be established.

Garnet

Garnet could be found in the Sinai and in the entire Eastern Desert, though a mine is known in southern Egypt (number 25 on Map 1).²²⁹ During the Late Middle Kingdom, the types of garnet beads shared between the sites show stronger connections between Tell el-Dab'a,²³⁰ Harageh,²³¹ Abydos,²³² Armant,²³³ and Esna.²³⁴ Furthermore, garnet beads have been recovered from Lahun,²³⁵ Matmar,²³⁶ and Denderah.²³⁷ During the Early Second Intermediate Period, a garnet bead is known from a tomb in Qau el-Kebir.²³⁸ During the Late Second Intermediate Period, garnet beads have been found at Sedment,²³⁹ Matmar,²⁴⁰ Mostagedda,²⁴¹ and Qau el-Kebir.²⁴² Nevertheless, only the last three sites have types in common.

Limestone

Limestone had many sources along the Nile Valley, as well as in the Western and Eastern Desert.²⁴³ For the Late Middle Kingdom, limestone beads have been excavated at Harageh,²⁴⁴ Lahun,²⁴⁵ Matmar,²⁴⁶ and Esna,²⁴⁷ while limestone vessels have been retrieved from Harageh,²⁴⁸ Riqqeh,²⁴⁹ Lahun,²⁵⁰ Mat-

229 Aston, Harrell, and Shaw 2000, 31–32; Lucas 1948, 451–52.

230 Schiestl 2009, 97, 418–21.

231 Engelbach and Gunn 1923, 9–13 and pls. L–LIII.

232 Garstang, Newberry, and Milte 1901; Peet and Loat 1913, 24–28; Randall-MacIver, Mace, and Griffith 1902, 55.

233 Mond and Myers 1937.

234 Downes 1974, 50–55 and Tomb catalogue.

235 Brunton 1920, 12–17 and 22–41; Petrie, Brunton, and Murray 1923, 13–15 and pls. XLVI–II, LXIII.

236 Brunton 1948, 54–56, pls. XLIII and LXXIII.

237 Petrie and Griffith 1900, 25–26.

238 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. V–VIII, XI, XXIV–XXV and XXXII.

239 Petrie and Brunton 1924, 16–21 and pls. XLVI–XLVIII.

240 Brunton 1948, 56–58, pls. XLIV and LXXIII.

241 Brunton and Morant 1937, 114–22 and 125–26, pls. LXVIII–LXXII.

242 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. V–VIII, XI, XXIV–XXV, XXXII.

243 B.G. Aston 1994, 35–39; Aston, Harrell, and Shaw 2000, 40–42; Lucas 1948, 471–72.

244 Engelbach and Gunn 1923, 9–13 and pls. L–LIII.

245 Brunton 1920, 12–17, 22–41.

246 Brunton 1948, 54–56, pls. XLIII and LXXIII.

247 Downes 1974, 50–55 and Tomb catalogue.

248 B.G. Aston 1994, 142–45; Engelbach and Gunn 1923, 16–17 and pl. XLVII.

249 Engelbach et al. 1915, 13 and 16, pls. VII and XIII.

250 Petrie, Brunton, and Murray 1923, 13–14, 17, 28 and pl. XLVIII.

mar,²⁵¹ Qau el-Kebir,²⁵² Edfu,²⁵³ and Elephantine,²⁵⁴ and limestone scarabs have been discovered in tombs in Edfu²⁵⁵ and in the Theban area.²⁵⁶ Only Harageh and Esna have one type of limestone bead in common.

For the Early Second Intermediate Period, one limestone bead is known from Harageh.²⁵⁷ For the Late Second Intermediate Period, only one type of limestone bead has been recorded, from Qau el-Kebir²⁵⁸ and Tell el-Dab'a.²⁵⁹ Limestone vessels of this period come from one tomb in Sedment²⁶⁰ and one tomb in Matmar,²⁶¹ from two tombs in Mostagedda,²⁶² and from a settlement context in Tell el-Dab'a,²⁶³ while one limestone scarab has been uncovered in the settlement of Tell el-Yahudiyah.²⁶⁴ All these sites, though, do not have any types in common of any of the limestone objects.

Quartz

Quartz was widely found along the Nile Valley.²⁶⁵ Quartz beads of the Late Middle Kingdom have been reported from Harageh,²⁶⁶ Esna,²⁶⁷ and Armant,²⁶⁸ while quartz vessels of the same period have been unearthed in two tombs in Tell el-Dab'a.²⁶⁹ Nevertheless, these sites do not have types in common for any of the quartz objects.

For the Early Second Intermediate Period, quartz vessels have been excavated in two tombs in Tell el-Dab'a.²⁷⁰ For the Late Second Intermediate Period, quartz beads have been recovered from Matmar,²⁷¹ Mostagedda,²⁷² and

251 Brunton 1948, 54–56 and pl. XLII.

252 Brunton, Gardiner, and Petrie 1930, 1–3 and pl. III.

253 Michałowski et al. 1939, 46–49 and pls. XX–XXI; Michałowski et al. 1950, 177–82 and pls. XVIII–XX.

254 Von Pilgrim 1996, 320.

255 Michałowski et al. 1950, 184 and pl. XLIV.

256 Loyrette, Nasr, and Bassiouni 1994, 116–18.

257 Engelbach and Gunn 1923, 9–13 and pls. L–LIII.

258 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. V–VIII, XI, XXIV–XXV and XXXII.

259 Hein, Jánosi, and Kopetzky 2004, 100–49.

260 Petrie and Brunton 1924, 16–21 and pl. XLI.

261 Brunton 1948, 56–58 and pl. XLII.

262 Brunton and Morant 1937, 114–22 and 128–29, pl. LXVIII.

263 Hein, Jánosi, and Kopetzky 2004, 179.

264 Griffith 1890, 39 and pl. X.

265 B.G. Aston 1994, 65; Aston, Harrell, and Shaw 2000, 51–52; Lucas 1948, 459–60.

266 Engelbach and Gunn 1923, 9–13 and pls. L–LIII.

267 Downes 1974, 50–55 and Tomb catalogue.

268 Mond and Myers 1937.

269 Forstner-Müller 2008, 129–40.

270 Forstner-Müller 2008, 140–217.

271 Brunton 1948, 56–58 and pls. XLIV and LXXIII.

272 Brunton and Morant 1937, 114–22 and 125–26, pls. LXVIII–LXXII.

Qau el-Kebir,²⁷³ while quartz beads and vessels have been found at Tell el-Dab'a,²⁷⁴ However, only Tell el-Dab'a and Matmar have one type of quartz bead in common.

Sedimentary quartzite

Sedimentary quartzite was widely found in the Western and Eastern Desert, as well as in the Nile Valley, though mines are known near Memphis and Elephantine (numbers 4 and 35 on Map 1).²⁷⁵ Sedimentary quartzite vessels have been excavated in tombs of the Late Middle Kingdom, respectively one in Harageh²⁷⁶ and one in Mostagedda,²⁷⁷ which have no types in common, as well as in two tombs in Tell el-Dab'a²⁷⁸ and in three tombs of the Late Second Intermediate Period in Tell el-Dab'a.²⁷⁹

Contacts through materials widely found in Egypt

For the objects of agate, basalt, limestone, quartz, and sedimentary quartzite, a localized production can be suggested. This is supported by the fact that the types shared between the sites are few: considering that the materials were widely found, they could have been obtained nearby the sites and worked locally. If, conversely, the objects were worked in specific workshops and transported from there, one would expect a more uniform range, hence more shared types.

This is the case with carnelian and garnet beads, which were more common probably because of the symbolic significance of these stones, whose red colour was connected to life-sustaining blood, power and vitality, as well as the sun.²⁸⁰ For the Late Middle Kingdom, the shared types mainly connect the sites in the Memphis-Fayyum area with the ones in Middle Egypt and in southern Upper Egypt, and suggest that the objects were probably worked – or their style was established – in the royal workshops in the capital in the Memphis-Fayyum area, as discussed above. For the entire Second Intermediate Period, the shared types show stronger connections between the sites in Lower and, especially in the case of garnet beads, Middle Egypt. The role detected for Tell el-Dab'a, which was an important site at the time, and its

273 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. V–VIII, XI, XXIV–XXV, XXXII.

274 Forstner-Müller 2008, 140–91; Forstner-Müller et al. 2015, 35–39; Hein, Jánosi, and Kopetzky 2004, 100–49.

275 B.G. Aston 1994, 33–35; Aston, Harrell, and Shaw 2000, 53–55; Lucas 1948, 477.

276 Engelbach and Gunn 1923, 9–13 and pls. L–LIII.

277 Brunton and Morant 1937, 113–14 and pl. LXXI.

278 Forstner-Müller 2008, 140–217.

279 Forstner-Müller 2008, 295–343.

280 Harrell 2012.

contacts with the sites in Middle Egypt, as elaborated on in the conclusions, suggest that the objects were worked there or that their style was established there.

IMPORTED LITHIC MATERIALS

Lapis lazuli and obsidian are not present in Egypt. Lapis lazuli was imported in Egypt from Western Asia, mostly from modern-day Afghanistan.²⁸¹ Obsidian was imported from the horn of Africa and the Arabian Peninsula, as well as from the Levant and the Aegean (especially the island of Melos).²⁸²

Lapis lazuli

For the Late Middle Kingdom, lapis lazuli beads have been retrieved from Tell el-Dab'a,²⁸³ Dahshur,²⁸⁴ Harageh,²⁸⁵ Lisht,²⁸⁶ Lahun,²⁸⁷ Riqqeh,²⁸⁸ Mostagedda,²⁸⁹ Qau el-Kebir,²⁹⁰ and El-Kab.²⁹¹ Based on the types in common between the sites, the major connections are among the sites of the Memphis-Fayyum area, and from there the connections lead both northward to Tell el-Dab'a and southward to the sites in Middle and in southern Upper Egypt. For the same period, one lapis lazuli vessel has been discovered in one royal tomb in Dahshur.²⁹² Lapis lazuli scarabs have been recorded at Tell el-Dab'a,²⁹³ Dahshur,²⁹⁴ Lahun²⁹⁵ Harageh,²⁹⁶ and Abydos;²⁹⁷ however, there are no types in common between the sites.

281 B.G. Aston 1994, 72–73; Aston, Harrell, and Shaw 2000, 39–40; Lucas 1948, 455–56.

282 B.G. Aston 1994, 23–26; Aston, Harrell, and Shaw 2000, 46–47; Lucas 1948, 473–74.

283 Schiestl 2009, 98, 289–93.

284 De Morgan, Legrain, and Jéquier 1903, 48–68, 74; De Morgan et al. 1895, 61–68, 91–114; Oppenheim 1996.

285 Engelbach and Gunn 1923, 9–13 and pls. L–LIII.

286 Lansing and Hayes 1934.

287 Brunton 1920, 12–17, 22–41; Petrie, Brunton, and Murray 1923, 13–15, pls. XLVIII and LXIII; Winlock 1934, 22, 30–41.

288 Engelbach et al. 1915, 13–14 and pls. XL–XLIII.

289 Brunton and Morant 1937, 113–14 and pl. LXXI.

290 Brunton, Gardiner, and Petrie 1930, 1–3, pls. II and IV.

291 Quibell, Clarke, and Tylor 1898, 15.

292 De Morgan et al. 1895, 71–75.

293 Mlinar 2001b, n. 19; Schiestl 2009, 241.

294 Ben-Tor 2007, 36–37; De Morgan et al. 1895, 69; Newberry 1907, pl. XVIII.

295 Ben-Tor 2007, 33–35; Tufnell, Martin, and Ward 1984, pl. 53; Winlock 1934, 55–56.

296 Engelbach and Gunn 1923, pl. XXII.

297 Garstang, Newberry, and Milte 1901, 11–12, 44 and pl. I; Martin 1971, n. IIII.

For the Early Second Intermediate Period, lapis lazuli beads come from Tell el-Dab'a²⁹⁸ and Harageh,²⁹⁹ but these sites have no types in common. For the Late Second Intermediate Period, lapis lazuli beads have been uncovered only at Tell el-Dab'a.³⁰⁰

Obsidian

Obsidian vessels of the Late Middle Kingdom have been reported from Harageh,³⁰¹ Dahshur,³⁰² and Lahun,³⁰³ respectively in one tomb for each site. The tombs in Dahshur and Lahun are royal ones and have one type of obsidian vessel in common. Obsidian scarabs of the same period have been unearthed at Lisht,³⁰⁴ Abydos,³⁰⁵ and Esna;³⁰⁶ however, these sites have no types in common. For the Late Second Intermediate Period, one obsidian vessel has been recovered from one tomb, known for its rich burial equipment, in the Theban area,³⁰⁷ while one obsidian scarab has been found in one tomb in Sedment.³⁰⁸

Contacts through imported materials

Obsidian probably entered Egypt from the horn of Africa or the Arabian peninsula, and from there was transported to the Memphis-Fayyum area. This is suggested by the fact that objects of obsidian have been excavated between southern Upper Egypt and the Memphis-Fayyum area, but not further north. During the Late Middle Kingdom, obsidian circulated between southern Upper Egypt and the Memphis-Fayyum area. The presence of obsidian in southern Upper Egypt can be explained by the administrative role played by the sites located in the area, as suggested by the fact that the only obsidian objects excavated at these sites are scarabs, which indicate that the population was busy with administrative activities, as explained earlier. The presence of obsidian in the Memphis-Fayyum area can be explained by the presence of the elite class living in the capital area, as discussed above; this is also supported by the fact that obsidian vessels have been unearthed in the area, which were

298 S.E.M. Müller 2013.

299 Engelbach and Gunn 1923, 9–13 and pls. L–LIII.

300 Forstner-Müller et al. 2015, 35–39.

301 B.G. Aston 1994, 142–45; Engelbach and Gunn 1923, 16–17 and pl. XLVII.

302 De Morgan et al. 1895, 71–75.

303 Winlock 1934, 66–69.

304 Ben-Tor 2007, 29; Martin 1971, n. 619.

305 Martin 1971, n. 1279; Peet and Loat 1913, 27 and pls. IV, VIII.

306 Downes 1974, 64.

307 Petrie and Walker 1909, 7–8, II.

308 Petrie and Brunton 1924, 18–19 and pl. XLIII.

used as grave goods in tombs of upper and middle classes. Obsidian was not imported during the Early Second Intermediate Period, probably because the troubles caused by the incipient political divisions made it difficult to import this material from the south. During the Late Second Intermediate Period, obsidian did not circulate, but has been found only at Thebes and Sedment. While on one side this shows contacts between southern Upper Egypt and the Memphis-Fayyum area, likely through desert routes, as discussed in the conclusions, on the other side it suggests that the sites usually did not have the means to acquire obsidian anymore. Lastly, the fact that there are no, or few types shared between the sites, during all the three periods examined, suggests that obsidian was transported as raw material and worked in local workshops according to local traditions.

Concerning lapis lazuli, there are good reasons to assume that Tell el-Dab'a was the point where it entered Egypt. Firstly, the geographical position of the site makes it a convenient point to enter Egypt from Asia through the Ways of Horus, as discussed above. Moreover, Tell el-Dab'a is the place where most lapis lazuli objects have been excavated. Lastly, lapis lazuli is found at the site not only during the Late Middle Kingdom, but also in the entire Second Intermediate Period; therefore, Tell el-Dab'a is the only site where this happens. For the Late Middle Kingdom, the distribution of objects of lapis lazuli shows that this material, after entering Egypt through Tell el-Dab'a, was transported to the Memphis-Fayyum area and to southern Upper Egypt. The connections created by the types shared during this period suggest that lapis lazuli reached southern Upper Egypt through the Memphis-Fayyum area, as well as that the types were mostly fabricated in the Memphis-Fayyum area and then sent from there; this suggestion is also supported by the existence of a unified style produced in royal workshops in the Memphis-Fayyum area, as discussed above. During the Early Second Intermediate Period, lapis lazuli was still present in the Memphis-Fayyum area, while during the Late Second Intermediate Period it was present only at Tell el-Dab'a. One possible interpretation is that Tell el-Dab'a kept receiving lapis lazuli during the entire Second Intermediate Period, and that during the Early Second Intermediate Period there was still an elite, possibly even a ruling, class present in the Memphis-Fayyum area, which had trade relations with Tell el-Dab'a. However, this hypothesis needs further investigation because there is also the possibility that – especially small – objects of lapis lazuli in contexts of the Second Intermediate Period could have been reworked from older objects.

METALS

Copper could be found in the Sinai and in the Eastern Desert at the latitudes of both the Memphis-Fayyum area and the Theban area (numbers 1, 2, 8, 28, 30 on Map 1),³⁰⁹ while gold and electrum came from southern Egypt and from Nubia (numbers 18 and 40 on Map 1).³¹⁰ Silver was mostly imported from the Aegean and the Levant, though traces of this metal can be found in gold or lead ores.³¹¹ Furthermore, chemical analyses have demonstrated that silver objects of the Middle Kingdom and the Second Intermediate Period could be made of silver retrieved from the gold mines of the Eastern Desert.³¹²

Copper

Most of the copper objects analysed in the present work is made of weapons. Beads of copper included in the analysis have been discovered only in contexts of the Late Middle Kingdom in Matmar³¹³ and in Esna;³¹⁴ these two sites do not have any type in common.

The copper weapons examined for the Late Middle Kingdom show that the major sites in the network were Tell el-Dab'a, Lahun, and Hu. Moreover, the types shared show two clusters, of which one includes Tell el-Dab'a, Esna, and Lisht, and one includes Qau el-Kebir and Lahun; the two clusters are connected through Hu, which shares types with both clusters. Concerning the copper weapons from the contexts analysed for the Early Second Intermediate Period, there are nearly no types in common. Only Tell el-Dab'a and Hu have one type in common.

The types in common for the copper weapons during the Late Second Intermediate Period show three clusters, of which one includes the sites in Lower Egypt, especially in the Eastern Delta, one includes the sites in Middle Egypt, and one includes only the Theban area.

309 Lucas 1948, 228–36; Ogden 2000, 149–55.

310 Lucas 1948, 257–62, 267–68; Ogden 2000, 161–64.

311 Lucas 1948, 478–83; Ogden 2000, 170–71.

312 Gale and Stos-Gale 1981.

313 Brunton 1948, 54–56, pls. XLIII and LXXIII.

314 Downes 1974, 50–55 and Tomb catalogue.

Gold and electrum

Gold and electrum beads of the Late Middle Kingdom have been recorded at Tell el-Dab'a,³¹⁵ Hawara,³¹⁶ Dahshur,³¹⁷ Harageh,³¹⁸ Lahun,³¹⁹ Lisht,³²⁰ Riqqeh,³²¹ Abydos,³²² Hu,³²³ Esna,³²⁴ and El-Kab.³²⁵ The types in common between the sites connect Tell el-Dab'a with the sites in southern Upper Egypt mostly through the sites in the Memphis-Fayyum area.

Gold and electrum beads of the Early Second Intermediate Period come from Tell el-Dab'a³²⁶ and Abydos,³²⁷ but the sites have no types in common. Gold and electrum beads of the Late Second Intermediate Period have been uncovered at Tell el-Dab'a,³²⁸ Tell el-Maskhuta,³²⁹ Sedment,³³⁰ Mostagedda,³³¹ Qau el-Kebir,³³² Balabish,³³³ and the Theban area.³³⁴ In this network, two types are in common between Tell el-Dab'a, Qau el-Kebir, and the Theban area, while the other sites have only one type in common.

Silver

For the Late Middle Kingdom, beads of silver have been reported mostly from Tell el-Dab'a,³³⁵ as well as from Dahshur,³³⁶ Matmar,³³⁷ Abydos,³³⁸ Hu,³³⁹ and

- 315 Forstner-Müller 2008, 129–40; Schiestl 2009, 98–99 and 418–40.
- 316 Farag and Iskandar 1971, 34–40; Petrie, Wainwright, and Mackay 1912, 35–36.
- 317 De Morgan, Legrain, and Jéquier 1903, 48–68 and 74; De Morgan et al. 1895, 61–68 and 91–114; Oppenheim 1996.
- 318 Engelbach and Gunn 1923, 9–13 and pls. L–LIII.
- 319 Petrie, Brunton, and Murray 1923, 13–15, pls. XLVIII and LXIII; Winlock 1934, 22 and 30–41.
- 320 Lansing 1924; Lansing and Hayes 1934.
- 321 Engelbach et al. 1915, 13–14 and pls. XL–XLIII.
- 322 Garstang, Newberry, and Milte 1901; Peet and Loat 1913, 23–28.
- 323 Bourriau 2009, 59; Petrie and Mace 1901, 42–44.
- 324 Downes 1974, 50–55 and Tomb catalogue.
- 325 Quibell, Clarke, and Tylor 1898, 15.
- 326 Forstner-Müller 2008, 140–91; S.E.M. Müller 2013.
- 327 Garstang, Newberry, and Milte 1901.
- 328 Forstner-Müller 2008, 295–99.
- 329 Redmount 1989.
- 330 Petrie and Brunton 1924, 16–20 and pls. XLVI–XLVII.
- 331 Brunton and Morant 1937, 114–22 and 125–26, pls. LXVIII–LXXII.
- 332 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. V–VIII, XI, XXIV–XXV, XXXII.
- 333 Wainwright and Whitemore 1920, 8–16 and 19–23, pls. VIII and XVI–XVII.
- 334 Hayes 1959, 20–21; Petrie and Walker 1909, 8–10; Tate et al. 2009; Troalen et al. 2009.
- 335 Forstner-Müller 2008, 129–40; Schiestl 2009, 98 and 436–40.
- 336 De Morgan, Legrain, and Jéquier 1903, 48–68 and 74.
- 337 Brunton 1948, 54–56, pls. XLIII and LXXIII.
- 338 Peet and Loat 1913, 23–28.
- 339 Petrie and Mace 1901, 42–44.

the Theban area,³⁴⁰ but these sites have no types in common. For the same period, silver spears have been found at Tell el-Dab'a.³⁴¹

For the Early Second Intermediate Period, silver beads have been unearthed at Qau el-Kebir.³⁴² For the Late Second Intermediate Period, silver beads have been recovered from Matmar,³⁴³ Mostagedda,³⁴⁴ Qau el-Kebir,³⁴⁵ and the Theban area,³⁴⁶ with types in common mostly between Mostagedda and Qau el-Kebir.

Contacts through metals

Concerning copper, both during the Late Middle Kingdom and the entire Second Intermediate Period there are few types shared, for both the beads and the weapons. This suggests a localized production, as supported also by the presence of copper workshops in Tell el-Dab'a, discussed above. Nevertheless, the clusters detected based on the shared types of weapons can hint at different traditions. For the Late Middle Kingdom, the two clusters detected can hint at two groups, of which the one with Tell el-Dab'a follows Levantine traditions (see Chapter 11), while the other one does not. For the Late Second Intermediate Period, the sites in Lower Egypt have in common types of narrow axes and knives and daggers, while the sites in Middle Egypt have in common types of axes from Pan-grave tombs, and the Theban area does not have any types of metal weapons in common with other areas. This shows three different traditions, of which one related to the Hyksos rulers, one related to the sites occupied by members of the Pan-grave culture, and one related to the Theban rulers.

Concerning gold and electrum, the connections detected through the shared types during the Late Middle Kingdom show stronger links between southern Upper Egypt and the Memphis Fayyum area, and between the latter and Lower Egypt. This suggests that gold objects travelled from Upper to Lower Egypt through the Memphis-Fayyum area. This also indicates that the types mostly originated in the Memphis-Fayyum area and then transported; this theory is also supported by the fact that, as discussed above, a unified style produced in royal workshops in the Memphis-Fayyum area, is known. For the Early Second Intermediate Period, the fact that beads of gold and elec-

340 Anthes 1943, 10–12.

341 Bietak and Hein 1994, n. 19; Bietak et al. 1994; Philip 2006, 64–67; Schiestl 2009, 377–82.

342 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. V–VIII, XI, XXIV–XXV and XXXII.

343 Brunton 1948, 56–58, pls. XLIV and LXXIII.

344 Brunton and Morant 1937, 114–22 and 125–26, pls. LXVIII–LXXII.

345 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. V–VIII, XI, XXIV–XXV and XXXII.

346 Hayes 1959, 20–21.

trum have been found at Tell el-Dab'a and Abydos shows that these sites had access to the necessary resources, though the absence of shared types suggests a localized production. While Abydos could have acquired the gold from nearby, from the Wadi Hammamat and Koptos, together with the other materials southern Egypt discussed above, Tell el-Dab'a may well have obtained it from the Levant, as shown by the fact that the golden beads are found mostly in tombs in which imported Levantine pottery has been found. For the Late Second Intermediate Period, gold and electrum objects show connections between Lower and southern Upper Egypt, which are suggested also by other materials discussed above.

Concerning silver, Tell el-Dab'a was probably the place where the material entered Egypt during the Late Middle Kingdom. Firstly, this is suggested by the fact that Tell el-Dab'a, as shown by the Cypriot pottery and by the presence of a Cypriot community (see Chapter 11), was a harbour playing a role in the relations with the Aegean, where silver was imported from. Furthermore, this is suggested by the fact that most silver objects have been excavated there. The fact that the sites share no types at the time also suggests that silver was distributed as raw material and worked locally, or that they had different sources for silver, which could partially be acquired also from gold mines. During the Second Intermediate Period, the fact that silver beads were present at sites in Middle and southern Upper Egypt can suggest that these sites acquired silver from the gold mines, which were geographically not distant. The number of types of silver objects shared between Mostagedda and Qau el-Kebir could be connected to the presence of people of the Pan-grave culture at both sites, showing that these communities became able to acquire silver during the Late Second Intermediate Period, probably because of an increased importance they had.

ORGANIC MATERIALS

There are two types of organic materials that are relevant to the present research: bone and shell. The final subsection discusses what the study of organic materials reveals about contacts in Egypt.

Bone

For the Late Middle Kingdom, bone beads have been retrieved from Edfu³⁴⁷ and Hu,³⁴⁸ which share one type. For the Early Second Intermediate Period,

347 Michałowski et al. 1939, 31–33, 126 and 130–31; Michałowski et al. 1950, 183–84 and 312.

348 Petrie and Mace 1901, 42–44.

bone beads have been discovered at Tod³⁴⁹ and Qau el-Kebir,³⁵⁰ which do not have any type in common. For the Late Second Intermediate Period, bone beads have been recorded at Tell el-Maskhuta³⁵¹ and Abydos,³⁵² which only have one type in common, and at Mostagedda,³⁵³ which shares no types.

Shell

For the Late Middle Kingdom, shell beads come from Matmar,³⁵⁴ Mostagedda,³⁵⁵ Abydos,³⁵⁶ Ballas,³⁵⁷ Esna,³⁵⁸ El-Kab,³⁵⁹ Edfu,³⁶⁰ and Elephantine.³⁶¹ When the types in common between the sites are considered, two separate groups are detected: one involving the sites in southern Upper Egypt, and one involving the sites in Middle Egypt; Elephantine bridges the two groups, because it has types in common with both of them.

For the Early Second Intermediate Period, shell beads have been uncovered at Tod³⁶² and Qau el-Kebir,³⁶³ which share one type, in mother of pearl, typical of the Pan-grave culture. For the Late Second Intermediate Period, shell beads have been reported from Tell el-Maskhuta,³⁶⁴ Lisht,³⁶⁵ Sedment,³⁶⁶ Matmar,³⁶⁷ Mostagedda,³⁶⁸ Qau el-Kebir,³⁶⁹ Balabish,³⁷⁰ Hu,³⁷¹ and the Theban area,³⁷² thus mostly in Middle and southern Upper Egypt. The types in common between the sites mainly link Matmar, Mostagedda, and Qau el-Kebir, while Tell el-

- 349 Barguet 1952.
- 350 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. V–VIII, XI, XXIV–XXV and XXXII.
- 351 Redmount 1989.
- 352 Peet 1914, 54.
- 353 Brunton and Morant 1937, 114–22 and 125–26, pls. LXVIII–LXXII.
- 354 Brunton 1948, 54–56, pls. XLIII and LXXIII.
- 355 Brunton and Morant 1937, 113–14 and Pl. LXXI.
- 356 Peet 1914, 54.
- 357 Petrie, Quibell, and Spurrell 1896, 2, 8.
- 358 Downes 1974, 50–55 and Tomb catalogue.
- 359 Quibell, Clarke, and Tylor 1898, 15.
- 360 Michałowski et al. 1950, 183–84 and 312.
- 361 Von Pilgrim 1996, 320.
- 362 Barguet 1952.
- 363 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. V–VIII, XI, XXIV–XXV and XXXII.
- 364 Redmount 1989.
- 365 Hayes 1959, 12–13.
- 366 Petrie and Brunton 1924, 16–21 and pls. XLVI–XLVII.
- 367 Brunton 1948, 56–58, pls. XLIV and LXXIII.
- 368 Brunton and Morant 1937, 114–22 and 125–26, pls. LXVIII–LXXII.
- 369 Brunton, Gardiner, and Petrie 1930, 3–10 and pls. V–VIII, XI, XXIV–XXV, XXXII.
- 370 Wainwright and Whittemore 1920, 8–16 and 19–23, pls. VIII and XVI–XVII.
- 371 Petrie and Mace 1901, 46, 51, 53.
- 372 Hayes 1959, 20–21.

Maskhuta is the only site that does not have any type in common with the other sites.

Contacts through organic materials

Beads of bone have been unearthed mostly at sites in southern Upper Egypt, and mostly at sites with Pan-grave tombs. The bead from Tell el-Maskhuta comes from a well-furbished tomb where also a bead of shell has been recovered, probably belonging to people who had contacts with southern sites.

Ostriches were found in the southernmost parts of Egypt.³⁷³ Therefore, the distribution of shell beads during the Late Middle Kingdom shows that the material did not circulate further north than Middle Egypt. The sites in Middle Egypt and the ones in southern Upper Egypt probably belonged to two different traditions, as suggested by the fact that the two areas had a different range of types. Furthermore, the fact that Elephantine shares types with both groups suggests that shell beads were distributed from there. For the Second Intermediate Period, shell beads were still present mostly in Middle and southern Upper Egypt, while the types shared create the stronger links between the sites where people of the Pan-grave culture were present.

It should be mentioned that the quality of the soil in Lower Egypt makes it more difficult for objects of organic materials to be preserved. Therefore, it cannot be excluded that more objects of organic materials were present there, and it should be kept in mind that conclusions drawn here are based only on the available data. However, analyzing the data from the sites in Upper Egypt, it still seems that bone and shell beads were mostly affiliated with sites with Pan-grave traditions, especially during the Second Intermediate Period.

CONCLUSIONS

During the Late Middle Kingdom, lithic materials, though these were more present at sites in geographic proximity of their sources, were widely distributed and were often transported far from their sources. They could be channelled through the Memphis-Fayyum area, where they were transported as raw materials and worked into finished objects in the royal workshops in the area. Precious stones, such as turquoise, and imported stones, such as lapis lazuli and obsidian, were mostly directed to the Memphis-Fayyum area and worked there, likely because the capital, and thus the royal family, the royal court, and other affluent people with the necessary resources, were located there. Only the very widespread stones, such as for example agate and limestone, show a more localized production, probably because they were

373 Lucas 1948, 48–49; Phillips 2000.

considered less prestigious and, therefore, kept to local workshops. The only exceptions to this trend are carnelian and garnet, which – probably on account of their symbolic significance – show contacts with the capital, where the objects could be produced or the style followed in the local workshops could be established. Among metals, only gold appears to create connections with the capital in the Memphis-Fayyum area, probably because of its preciousness, while silver, which likely was imported and entered Egypt through Tell el-Dab'a, and copper objects were mostly worked according to local traditions. Lastly, organic materials such as bone and shell have been found only in Middle and southern Upper Egypt; especially the shell beads show that Middle and southern Upper Egypt followed different traditions.

During the Early Second Intermediate Period, the variety of lithic materials decreased, as did their circulation. These materials appear to circulate mostly between Lower and Middle Egypt, while the Memphis-Fayyum area was still included in the distribution of the most precious stones and of the stones entering Egypt through Tell el-Dab'a. This shows that trade still continued between Tell el-Dab'a and the Memphis-Fayyum area, as well as that an elite class capable of acquiring expensive materials, probably even a ruling class made of the last kings of the Thirteenth Dynasty, was still present at the Memphis-Fayyum area. When the materials could be found in both the central and southern parts of Egypt, the sources in the central part appear to have been the ones more used, while the resources from the southern part were acquired only when available in proximity of the main wadis in the Eastern Desert, namely the Wadi Hammamat and the Wadi Barramiya, probably because the sites did not have the means to reach deeper into the desert or because it was too dangerous in a time of political divisions. Materials from the southern part of Egypt did not reach Lower Egypt, the only exception being the feldspar beads found at Harageh. Lastly, stones imported from further south in Egypt have not been found in contexts of this time: this could derive from the fact that there were no sites with the resources required to do so at the time. All in all, the types shared suggest that the lithic materials were worked locally or, in the case of materials that could be found also in the central part of Egypt, at Tell el-Dab'a: this is supported by the fact that the site was an important and thriving place at the time, as discussed in the conclusions. At the same time, metal objects show a mostly localized production, worked according to the traditions of the site or the area. While gold was still transported to Lower Egypt, probably from the Levant, silver was probably not imported at this time, but extracted from gold mines. Silver, together with bone and shell objects, seems to be indicator of the Pan-grave culture and, especially silver, of a possible importance that communities of this culture had at the time.

During the Late Second Intermediate Period, lithic materials, especially the ones from the central part of Egypt, still appear to circulate more commonly between Lower and Middle Egypt, though contacts were present between Lower and southern Upper Egypt. The Memphis-Fayyum area was still involved in the communications, especially as access point to the desert routes through the Western Desert, which were used at the time for communications between Lower and southern Upper Egypt, as mentioned above and discussed in the conclusions. The materials from southern Egypt seem to have been shipped as raw material and be worked locally, reaching also Tell el-Dab'a; the communities of Pan-grave culture probably played a role in this. The stones from the Sinai and the stones imported from the Levant were present only at Tell el-Dab'a, probably because the other sites did not have the means to acquire them. Rock crystal seems to be an exception, but, considering its distribution, it is possible that its sources were in the Western Desert at the time. Stones that could be imported into Egypt from further south, such as obsidian, still reached the Memphis-Fayyum area, at the time. Among metals, gold demonstrates connections between Lower and southern Upper Egypt, while copper and silver show a more marked regionalization. Through the objects of copper, Lower Egypt, Middle Egypt, and the Theban area are detected as three separate clusters, while objects of silver appear to be connected to sites with Pan-grave culture or Nubian people. Lastly, shell beads are present in Middle and southern Upper Egypt and show a cluster involving the sites with Pan-grave culture; bone beads are found both in Lower and Middle Egypt up to Abydos, but are still more related to sites with Pan-grave culture.

CONCLUSIONS

The goal of this research was to analyse the relationships between sites during the Late Middle Kingdom, the Early Second Intermediate Period, and the Late Second Intermediate Period (i.e. between ca. 1850 and 1550 BC) in order to better understand the nature of regionalization during this complex era of Egyptian history. The analysis focused on the types of objects shared by the sites. The assumption underlying the analysis is that the closer the contacts are between two or more sites, the more similar the material culture unearthed at these sites will be. The material has been examined using network analysis, which allows us to study the relationships between different elements based on what they have in common.

The groups of objects considered for the analysis include beads, scarabs, stone vessels, Tell el-Yahudiyah ware, Cypriot pottery, and weapons. These different types of objects provide insights into different aspects of the communities that manufactured and used them, as well as in the exploitation of the resources needed to produce them. In the following three sections, each dedicated to one of the three chronological phases mentioned earlier, the sites that the present analysis has detected as playing a major role will be discussed. At the end, reconstructions of the situation in each of the three phases is offered, along with a summary of the main developments in ancient Egypt between ca. 1850 and 1550 BC.

LATE MIDDLE KINGDOM

In the Delta, Tell el-Dab'a was the main site in the networks of weapons and Tell el-Yahudiyah ware, in other words it shared the higher number of objects with the higher number of sites; it could therefore be the place where the communications started or ended, and where new trends spread from. In the same mentioned networks, Tell el Dab'a was also the main intermediary, namely the site through which connections between other sites passed and it was, therefore, a passageway or (re-)distribution centre. Moreover, Tell el-Dab'a is the site where most Cypriot pottery is found for the Late Middle

Kingdom, together with only few instances in Dahshur and Kahun.¹ However, only one type is shared, between Tell el-Dab'a and Kahun.

Tell el-Yahudiyah ware was used mostly as burial gift and it is possible that some of the specimens were originally placed in temples, at least in Tell el-Dab'a. Research has shown that this ware was first produced in coastal Palestine during the Late Middle Kingdom, from where it was imported into Egypt during the transition between the Egyptian Late Middle Kingdom and Second Intermediate Period, before being locally produced and developing into a local Egyptian branch during the Second Intermediate Period (see Chapter 10). Moreover, pottery, weapons, scarabs, buildings, and grave goods similar to the ones found in the Levant, namely the area of modern-day Syria and Palestine, have been excavated especially at Tell el-Dab'a and point at the likely presence of a Levantine community (see Chapter 4).

Cypriot vessels arrived at first into Egypt because they were used to transport, store, and/or pour valuable liquids – probably oil – from Cyprus. Over time, they became locally produced, probably because the local population was by then accustomed to the consumption of these type of vessels or of the types of products that they contained. Lastly, the presence of a Cypriot community at Tell el-Dab'a has been suggested on the basis of techniques used in the production of both Tell el-Yahudiyah ware and Cypriot pottery, which are very similar to the ones attested in Cyprus itself (see Chapter 11).

The described results indicate the importance of Tell el-Dab'a in networks involving other lands, in particular Syria-Palestine, and in making products from these lands circulate in Egypt. This confirms that Tell el-Dab'a was a major hub connecting Egypt and foreign lands, as shown also by other types of pottery, such as the Canaanite jars² and the Levantine Painted Ware³ (see Chapter 4), as well as by finds such as the statue depicting a man with features traditionally associated with the Levant⁴ (see Chapter 2), and by the presence of objects of precious materials such as lapis lazuli, turquoise, silver, and gold (see Chapter 13). However, the results detected for Tell el-Dab'a concerning the objects produced in Egypt, especially the beads, the stone vessels, and the scarabs and seal impressions, indicate that the most common types were not produced there, but in the area of the capital. In its turn, this suggests that the site was still under the control of the main ruling dynasty.

1 As shown by the specimens discussed in: Maguire 1995; Maguire 2009.

2 Arnold, Arnold, and Allen 1995, 13–20; D.A. Aston 2002, 43–46; Cohen-Weinberger and Goren 2004; Kopetzky 2008, 213; McGovern and Harbottle 1997.

3 Arnold, Arnold, and Allen 1995, 17, 30; D.A. Aston 2002, 53; Bagh 2002; Bagh 2013; Bietak 1997, 98; Bietak 2002, 38–39; Cohen-Weinberger and Goren 2004, 81; Czerny 2002, 133.

4 Bietak 1997, 100; Schiestl 2006; Schiestl 2009, 75–89.

The Memphis-Fayyum area

The sites in the Memphis-Fayyum area, Lahun and Harageh were main sites in nearly all the networks detected, except for the Cypriot pottery. Lisht has also been detected as a main site for scarabs and Tell el-Yahudiyah ware, while Dahshur has been detected as a main site for beads and stone vessels.

Lahun and Harageh were located in the area of the capital, where the central administration was based and where objects were produced in the royal workshops, as shown by e.g. uniformly shaped scarabs and their sealing designs (see Chapter 9), and the pottery (see Chapter 3) excavated in contexts dated to this time. This idea is further supported by the results of the present analysis, which has shown that the main types, namely the types most found at the sites, characterized the range of objects in the sites in the area and were, therefore, likely produced there. The presence of imported materials, such as lapis lazuli, silver, and obsidian, and the wide range of objects, both of which characterize the settlement of Lahun and the cemeteries of Lahun and Harageh (see Chapter 13), further attest to the fact that people occupying these sites had not only the means to acquire prestige goods, but also easier access to them than other areas in Egypt.

The role of Lisht in the network of Tell el-Yahudiyah ware can be interpreted in two ways. The first assumes the presence of people from the Levant, as suggested by, among others, pottery⁵ and scarabs⁶ that, based on their materials and techniques, were not locally produced and were similar to the ones found in the Levant. However, we must be careful not to draw a direct link between material culture and ethnicity. The first reason for that is that ethnicity is a multi-faceted part of a person's or community's identity, which can be expressed in multiples ways, not always detectable through and not always involving material culture. The second reason is that the material culture is influenced not only by the need to express identity, but by other reasons, such as the desire or the necessity to use new techniques or to commercialize a specific product. Lastly, ethnic groups exchange elements on different levels and in different ways, i.e. just imitating or assimilating and transforming. Therefore, defining the ethnicity of objects based on specific elements can be deceiving (see Chapter 4). At the same time, the role of Lisht in the network of scarabs can be due to the fact that many officials were buried there in the cemeteries around the royal pyramids, officials which included viziers, chiefs of police, scribes, judges, chamberlains, chamber keepers, attendant of the king's table, priests, treasurers; women of the higher classes, with the title Lady of the house, were buried with scarabs as well in the cemetery of

5 Merrillees 1973.

6 Martin 2004.

Lisht.⁷ Part of the scarabs was included in the grave goods because they had been used by the owners of the tombs, while another part was included as amulets; the latter can be distinguished thanks to the funerary epithets added to the owners' names and titles. Moreover, partially preserved sealings have also been excavated at Lisht, which attest the opening of sealed goods or documents (see Chapter 9).

Lastly, the rich range of beads and stone vessels found at Dahshur is no doubt due to their being used as grave goods in the burials of royal individuals.⁸

Middle Egypt

Among the sites in Middle Egypt, Rifeh was a main site in the network of stone vessels, while Matmar and Qau el-Kebir appear to have been important intermediaries respectively for the stone vessels and for the beads.

The sites located in this area were connected to the oases in the Western Desert and had access to the wadis in the Eastern Desert (see Map 1), where the resources necessary to produce beads and stone vessels, such as steatite, calcite-alabaster, and amethyst, were found (see Chapter 13). On the western bank of the river, from Beni Adi in the area of Asyut, near Rifeh, two routes crossed the Western Desert and led to the oases located in this desert. The first route, the Darb el-Tawil, led to Teneida, on the eastern side of Dakhla Oasis near Ain Asil (see Map 1).⁹ Satellite images and the detection of both cairns used as route markers, the so-called *alamat*,¹⁰ and animal footprints, especially camels, which were the preferred animals to travel in the desert after Pharaonic times,¹¹ have recently been used to reconstruct this route.¹² Though the intensity of its use cannot be determined yet, the route of Darb el-Tawil was the most convenient to cross the desert, considering the conditions of the terrain,¹³ thus it can be supposed that was in use also during the Middle Kingdom and the Second Intermediate Period. The second route, the Darb el-Arbain, led to Kharga Oasis (see Map 1). A recent survey has led to believe that this route was used for a long time during Pharaonic times.¹⁴ Even though

7 Di. Arnold 2008.

8 De Morgan, Legrain, and Jéquier 1903; De Morgan et al. 1895.

9 This route is discussed in Bubenzer and Bolte 2013. It is also mentioned in Förster 2013, 319.

10 The roles of *alamat*, and desert trails marked by them, are discussed in: Bubenzer and Bolte 2013; Köpp 2013; Riemer 2007; Rossi and Ikram 2013.

11 Köpp 2013.

12 Bubenzer and Bolte 2013.

13 Bubenzer and Bolte 2013, 72–74.

14 Rossi and Ikram 2013. This route is mentioned also in: Bubenzer and Bolte 2013, 61–64 and 74.

this assumption is based on preliminary results, and further archaeological research is needed to establish in which period the route was actually in use, it is possible that people travelled through this route also during the period examined in the present work.

On the eastern bank of the river, the system of wadis gave access to the resources mentioned above. Two locations stand out, which have been studied and whose occupation has been dated to the Middle Kingdom and the Second Intermediate Period. The first are the limestone quarries in the Wadi Nakhla (number 12 on Map 1), which were accessible from Deir el-Bersha, a site located on the east bank of the Nile north of Asyut and famous for the rock-cut tombs of the Middle Kingdom;¹⁵ this site was also used for burials during the Second Intermediate Period and the New Kingdom.¹⁶ Pottery of the Middle Kingdom and the Second Intermediate Period excavated there show that the quarries were exploited during the time, though not intensively.¹⁷ The second location is the galena mines at Gebel el-Zeit, near the coast of the Red Sea (number 14 on Map 1), where inscribed material, especially stelae, with royal names of Middle Kingdom and the Second Intermediate Period has been found.¹⁸ The stelae from the Middle Kingdom show also connections with Koptos, as demonstrated by the mentions of the god Min of Koptos and by the fact that one stela is probably made of a type of stone coming from the Wadi Hammamat, while the stelae of the Second Intermediate Period mention rulers ascribed to the Sixteenth and the Seventeenth Dynasty.¹⁹ Moreover, specimens of Tell el-Yahudiyah ware and a scarab similar to the ones found at Tell el-Dab'a during the Late Second Intermediate Period²⁰ indicate that the site had contact with the Hyksos too. All this shows not only how the resources in the central Eastern Desert were exploited by the central power during the Middle Kingdom, but also that rulers from different areas both in Lower and Upper Egypt had access to these resources during the Late Second Intermediate Period. This latter aspect will be elaborated in the section on the Late Second Intermediate Period.

Lastly, Qau el-Kebir and Matmar, whose role was mostly to bridge other areas, were convenient spots for communication between the Memphis-Fayyum area and southern Upper Egypt when travelling along the Nile, because of

15 See for example: Willems and Op de Beeck 2007.

16 Bourriau et al. 2005.

17 De Laet et al. 2014.

18 Marée 2009.

19 Marée 2009.

20 Cherpion and Buchez 2007, 56–57.

their location in the middle of the Nile Valley. The importance of Rifeh and Qau el-Kebir is further shown by the rock-cut tombs of its governors.²¹

Abydos and the Qena bend

In southern Upper Egypt, around the area of the Qena bend of the Nile, Abydos was a main site in the networks of beads and stone vessels, while Nubt was a main site for scarabs, and Hu was a main site for stone vessels and weapons. At the same time, important intermediaries were Hu in the network of weapons, Denderah in the network of stone vessels, Ballas in the networks of beads and scarabs, and Tod in the network of beads.

Southern Upper Egypt was well connected with both the oases in the Western and the mineral resources in the Eastern Desert. On the west bank of the river, from near Hu it was possible to reach the oases in the Western Desert through the so-called Girga road (see Map 1),²² which linked the site with Kharga Oasis: ostraca, seal impressions, pottery, a cistern and dry-stone structures found at Abu Ziyâr and Tundaba show that there were outposts there during both the Middle Kingdom, mostly in the first part, and in the Late Second Intermediate Period.²³ From Kharga, two main desert routes led further west to Dakhla Oasis, arriving at its eastern side around modern-day Teneida and Ain Asil. The more southern route, the Darb el-Ghubbari (see Map 1), followed the Gebel Abu Tartur, which is the mountain between the oases of Kharga and Dakhla. The more northern route, the Darb Ain Amur (see Map 1), started from 'Ain Lebekha and passed through the small oasis of Umm el-Dabadib and through Ain Amur.²⁴ From the oases of Kharga and Dakhla it was then possible to reach further north along the Nile Valley around Asyut, through the Darb el-Arbain and the Darb el-Tawil (see Map 1), both discussed above, and south into Nubia, through the continuation of the Darb el-Arbain and the Abu Ballas trail (see Map 1), which will be described in detail in the section about the oases. It is also worth mentioning that from the Girga road started the Darb Bitan (see Map 1), which led to Kurkur Oasis and, from there, further south into Nubia.²⁵

21 For Rifeh: Petrie, Thompson, and Crum 1907, 11–13. For Qau el-Kebir: Brunton, Gardiner, and Petrie 1930, 1–9; Steckeweh, Steindorff, and Kühn 1936.

22 This route is discussed in: Deborah Darnell 2002; John C. Darnell 2002; Darnell and Darnell 2002; Darnell and Darnell 2013.

23 Deborah Darnell 2002; John C. Darnell 2002; Darnell and Darnell 2002; Darnell and Darnell 2013.

24 These two routes are discussed in Rossi and Ikram 2013.

25 For the routes between the area of Aswan and Nubia: John C. Darnell 2004; Storemyr et al. 2013a; Storemyr et al. 2013b. The Darb Bitan is mentioned in: Storemyr et al. 2013a, 400.

On the eastern bank of the Nile, two main wadis stretch from the Qena bend into the Eastern Desert: the Wadi Qena and the Wadi Hammamat (see Map 1). The first one starts around Denderah, while the second one starts around Koptos, both lead to other wadis in the desert and to the mineral resources where the material analysed in the present work can be found, such as jasper, serpentine, siltstone (see Chapter 13 and Map 1). The Wadi Hammamat further connects to the Red Sea coast, to modern-day el-Qoseyr.

In addition, more routes passing through the Theban Desert, inside the Qena bend, linked the sites located on the southern side of the river bend with the ones located on its northern side. The main one was the route connecting modern-day Luxor, on the southern side of the bend, to near modern-day Farshût, thus near Hu, on the northern side of the bend (see Map 1).²⁶ Its use during the Middle Kingdom is suggested by pottery found at the Gebel Antef, at the beginning of this route near Luxor, and at Wadi el-Hôl, mid-way across the route.²⁷ Furthermore, a chapel of the Seventeenth Dynasty at the Gebel Antef²⁸ and pottery, retrieved both at the Gebel Antef and at the Wadi el-Hôl, demonstrate the intense use of the route during the Late Second Intermediate Period.²⁹ Lastly, graffiti that could be dated to these two periods have been found as well at the mentioned locations.³⁰ Another route in the Theban Desert was the Darb Ba'irat (see Map 1), which started west of the main Luxor-Farshût route, to converge in it after the Gebel Antef: though used since the Second Intermediate Period, it was mostly used in the Graeco-Roman Period.³¹ Thirdly, the so-called 'Alamat Tal road (see Map 1) started east of the main Luxor-Farshût route and ran parallel to it, until it converged in it at the Gebel Qarn el-Gir. There rubble and mud-brick towers with pottery of Second Intermediate Period, as well as graffiti possibly dating to the Middle Kingdom and the Second Intermediate Period, were found.³² The Gebel Qarn el-Gir was an important point, because also the trail connecting the Theban Desert with

26 Darnell and Darnell 1993; Darnell and Darnell 1994a; Darnell and Darnell 1994b; Darnell and Darnell 1995; Darnell and Darnell 1996; Darnell and Darnell 2002; John C. Darnell 2002.

27 Darnell and Darnell 1993; Darnell and Darnell 1994a; Darnell and Darnell 1994b; Darnell and Darnell 1995; Darnell and Darnell 1996; Darnell and Darnell 2002.

28 Darnell and Darnell 1993; Darnell and Darnell 1994a; Darnell and Darnell 1994b; Darnell and Darnell 1995.

29 Darnell and Darnell 1993; Darnell and Darnell 1994a; Darnell and Darnell 1994b; Darnell and Darnell 1995; Darnell and Darnell 1996; Darnell and Darnell 2002.

30 Darnell and Darnell 1993; Darnell and Darnell 1994a, Darnell and Darnell 1995.

31 Darnell and Darnell 1993; Darnell and Darnell 1994a; Darnell and Darnell 1994b; Darnell and Darnell 1995; John C. Darnell 2002.

32 Darnell and Darnell 1993; Darnell and Darnell 1994a; Darnell and Darnell 1994b; Darnell and Darnell 1995; Darnell and Darnell 1996; John C. Darnell 2002.

the route of the Girga road started there (see Map 1).³³ Furthermore, behind the so-called Thoth mountain a trail was detected, which features a chapel at its end and was used also in the Middle Kingdom and in the Second Intermediate Period, but probably not intensively.³⁴ Lastly, the route of the Darb Rayayna (see Map 1) connected Armant, on the southern side of the river bend, to Hu, on the northern side of the bend, but it seems to have been used mostly in the Old Kingdom.³⁵

Apart from their connection to routes of communication, the importance of the sites for administrative activities, involving the storage and transferral of commodities and goods and the documentation of the process (see Chapter 13), as well as for practising cults for specific gods or kings, is attested by archaeological finds. For Abydos, this importance is shown by the mortuary temple of Senwosret III (and the town built in connection to it),³⁶ its royal tombs,³⁷ and the seal impressions unearthed there.³⁸ The importance of Hu is demonstrated by its cemetery. The tombs there contained many metal objects, including weapons, such as axes and daggers and knives, and objects of silver, such as earrings and amulets; one of the daggers unearthed there features a royal name.³⁹ The importance of Ballas and Denderah is mostly known for other periods. At Ballas, more specifically at the site of Deir el-Ballas, two palaces of the Late Second Intermediate Period have been excavated:⁴⁰ it was ruled by Thebes and used as military base by the kings of the Seventeenth Dynasty in the fight against the Hyksos rulers, as shown by the inscribed ostraca retrieved there.⁴¹ Denderah is mostly known for being the centre of the cult of Hathor and for temples and a town of later periods, as well as for cemeteries of earlier periods.⁴² For the Late Middle Kingdom, the contexts excavated at both Denderah and Ballas include tombs.⁴³ However, the results detected for these sites during this period indicate that the people buried there had access to the goods and to the relevant networks during Late Middle Kingdom. Moreover, Nubt is known for a settlement. The many

33 Darnell and Darnell 1993; Darnell and Darnell 1995.

34 Darnell and Darnell 1994a; Darnell and Darnell 1995; John C. Darnell 2002.

35 Darnell and Darnell 1994a; Darnell and Darnell 1995; John C. Darnell 2002.

36 Wegner 1998; Wegner 2001; Wegner 2010; Wegner, Smith, and Rossell 2000.

37 Ayrton et al. 1904; Wegner and Cahail 2015.

38 Wegner 1998; Wegner 2004; Wegner, Smith, and Rossell 2000.

39 Petrie and Mace 1901.

40 Bourriau 1987a; Bourriau and Lacovara 1984.

41 As explained by Peter Lacovara in his presentation at the conference “Palaces and Residences in Ancient Egypt” (London 12–14th July, 2013), available at: https://www.academia.edu/36177396/Deir_el-Ballas.

42 Petrie and Griffith 1900.

43 Petrie and Griffith 1900, 25–26; Petrie, Quibell, and Spurrell 1896, 2 and 8.

scarabs from the site⁴⁴ and the results of the analysis suggests that, during the Late Middle Kingdom, it was a site where goods were stored and (re-)distributed from. Lastly, Tod is known for the temple dedicated to the god Montu, whose use in the Middle Kingdom is indicated by a long inscription of a king Senwosret, probably Senwosret I.⁴⁵ Furthermore, hidden below the stone foundations of the same temple, a treasure has been unearthed, which consists of four chests, containing objects of gold, silver, copper, lapis lazuli and other gemstones.⁴⁶ While, based on the archaeological context, this treasure could be dated to a later date, up to the New Kingdom, the objects themselves indicate a date during the reign of Amenemhat II.⁴⁷

Southern Upper Egypt: south of the Qena bend

South of the Qena bend, Esna was a main site in the networks of stone vessels and scarabs, while Edfu was a main site in the network of stone vessels and an intermediary in the network of scarabs, and Elephantine was a main site in the network of scarabs.

Esna and Edfu are at the two extremities of a wadi basin where feldspar, steatite, and serpentine are found (number 27 on Map 1), while Elephantine was near the amethyst quarry of Wadi el-Hudi (number 36 on Map 1), which was intensively used during the Middle Kingdom, as shown by a hilltop settlement and a small fortress, as well as graffiti, few stelae, and pottery, all dated to the Middle Kingdom.⁴⁸

Moreover, from Edfu and Elephantine two routes led further south into Nubia.⁴⁹ Pottery imported from Nubia, and its local imitations, excavated at Edfu,⁵⁰ at Elephantine,⁵¹ and in the area around Elephantine⁵² attest to contacts with Nubian communities and even their presence at the sites during both the Late Middle Kingdom and the Second intermediate Period. In addition, inscribed material such as stelae and rock inscriptions further indicate that the mentioned routes to Nubia were in use already from the early part of the

44 Ben-Tor 2007, 10–31 and 78–97; Martin 1971; Petrie, Quibell, and Spurrell 1896, 65–67 and pls. LXXX–LXXXI.

45 Barbotin and Clère 1991; Redford 1987.

46 Bisson de la Roque 1937; Bisson de la Roque 1950; Bisson de la Roque, Contenau, and Chapouthier 1953; Marcus 2007.

47 Bisson de la Roque, Contenau, and Chapouthier 1953, 15–13; Kemp and Merrillees 1980, 290–96; Lilyquist 1993, 35–36; Pierrat 1994, 20–23.

48 Shaw 1994; Shaw and Jameson 1993.

49 For general discussion on these routes: John C. Darnell 2004; Storemyr et al. 2013a; Storemyr et al. 2013b.

50 Ayers and Moeller 2012.

51 Näser 2013; Raue 2018, 208–262.

52 Gatto, Curci, and Urcia 2014; Giuliani 2013; Näser 2013.

Middle Kingdom.⁵³ The first route joined the Darb Bitan with two points in the area of Edfu, so that it became bifurcated at the Nile Valley and, as visible on the map, one of the tracks of the bifurcation is known as Schatt el-Rigal (see Map 1).⁵⁴ The second route, the Sikket el-Agamiya, had its terminus in the Nile Valley in the area of Aswan and Elephantine (see Map 1). Both these routes led to Kurkur Oasis, from where other routes would lead further south to Dunqul Oasis and, ultimately, into Nubia (see Map 1),⁵⁵ where other important resources such as the carnelian at Stela Ridge were located (number 38 on Map 1). Hawk statues, stelae, pyramidia, offering tables, as well as possible dwelling structures unearthed at Stela Ridge, all dated to the Middle Kingdom, demonstrate an intense use of the site during the time. A finished carnelian earring found there suggests the possibility that part of the material could be worked into finished products in situ, though no findings that could be interpreted as workshops were excavated at the site.⁵⁶

Scarabs were used in administrative tasks, which included the opening and closing of commodities such as wooden boxes, baskets, and ceramic jars, as well as the documentation of the commodities and their movements on papyri and ostraca (see Chapter 9). Moreover, scarabs were used as amulets, for example when they were used as grave goods (see Chapter 9). Therefore, the role detected by the present analysis for Esna, Edfu, and Elephantine in the networks of scarabs further suggests that people there were involved in the administrative activities mentioned above, or that these people were actively participating in common burial customs and a common material culture. The role detected for Esna and Edfu in the network of stone vessels indicate that the people buried in the cemeteries at the sites were wealthy enough to acquire them and were part of the networks needed to access them. This is further confirmed by archaeological finds. At Edfu a large building with many sealings of the Middle Kingdom, including several naming the king Amenemhat III, and of the Second Intermediate Period (see Chapter 2) has been unearthed.⁵⁷ This building has two halls with wooden columns, which have parallels in Elephantine and Lahun and which could be used for the reception and supply of commodities, as suggested by a representation of a columned hall in a wall painting in a tomb in Beni Hasan.⁵⁸ The importance of Esna is attested by the large cemetery, where tombs are accompanied by stelae, and

53 For these written sources: John C. Darnell 2004.

54 For the Schatt el-Rigal: John C. Darnell 2004.

55 For the Sikket el-Agamiya: John C. Darnell 2004; Storemyr et al. 2013a; Storemyr et al. 2013b.

56 For the finds at Stela Ridge: Shaw et al. 2010.

57 Moeller 2009; Moeller 2010; Moeller 2012; Moeller, Marouard, and Ayers 2011.

58 As discussed in Moeller 2010.

the chapel of Senwosret I uncovered there.⁵⁹ At Elephantine, a large settlement and many seal impressions have been discovered, which again suggest it was important in the administrative tasks mentioned above.⁶⁰

The oases

In the oases, Ain Asil served as an intermediary site in the network of beads. This suggests that Dakhla Oasis, where both settlement and tombs from this period have been excavated,⁶¹ had contacts with the sites in the Nile Valley. In detail, the oasis of Dakhla had the possibility of being in contact with three different areas of the Nile Valley, through the routes crossing the Western Desert. The first one is southern Upper Egypt, around Abydos–Hu and the Qena bend: communication between this area and Dakhla Oasis would pass by Kharga Oasis, thus using the route of the Girga Road, the Darb Ain Amur, and the Darb el-Ghubbari (see Map 1), all described above. The second area is near Asyut, through the Darb el-Tawil (see Map 1), which has been described above and was the more direct route to the Nile Valley, cutting directly through the Western Desert without passing by any other oasis. The third area is the Fayyum, which could be reached from Dakhla Oasis by passing through Bahariya Oasis. The route connecting Bahariya to the Fayyum was the Darb el-Rayyan (see Map 1), which has recently been detected through the analysis of satellite images.⁶² This route started at Ain Bahariya and possibly reached the southern-western side of the Fayyum, at the Middle Kingdom site of Medinet Madi, where a temple for the goddess Renenutet has been discovered.⁶³ From there, the route of the Darb el-Wahat (see Map 1) followed the southern side of the Fayyum and led to its southern-eastern part, in the area of Gurob.⁶⁴ Further south, parts of other parallel routes have been detected between Bahariya and the Nile Valley up to Minya (see Map 1), especially the Darb el-As'as (starting from the Darb el-Rayyan towards the Nile at Maghaga); the Darb el Masudi (from Ayn el-Bahariya and Ayn el-Harrah to el-Sheikh Masud north of el-Bahnasa in the Nile valley), the Darb el-Bahnasawi (from Ayn el-Harrah to el-Bahnasa in the Nile valley), and the Darb el-Rubi (from the south end of the Ayn el-Harrah depression to the Nile valley at el-Rubi).⁶⁵ The fact that Late

59 Downes 1974; El-Saghir 1999; Liszka 2012b.

60 Von Pilgrim 1996.

61 Aufrère and Ballet 1990; Ballet 1987; Ballet 1988; Ballet 1990; Hope 1980; Hope 1983; Hope 1987a; Hope 1987b; Hope 1987c; Hope 1999; Marchand, Soukiassian, and Bourriau 2010.

62 For this route: Gasperini and Pethers 2018.

63 Bresciani and Giammarusti 2015.

64 This route is discussed in: Gasperini and Pethers 2018.

65 These routes are discussed in: Gasperini and Pethers 2018.

Middle Kingdom pottery found at Qaret el-Tub, near Ain Bahariya,⁶⁶ further shows that the oasis was inhabited at the time, therefore it is possible that the Darb el-Rayyan was also in use.

From Dakhla Oasis it was possible to reach further south into Nubia. The Abu Ballas trail (see Map 1) connected the oasis with Gilf Kebir and the Gebel Ouenat. Outposts for provisions of water and barley, and even for keeping watch and making bread, as well as camping sites were found along the trail.⁶⁷ However, the pottery retrieved indicates that this route was not much used during the period under examination, given that no pottery of the Middle Kingdom has been found.⁶⁸ Even though an inscription dating to the early part of the Middle Kingdom demonstrates that there was an interest in the route,⁶⁹ it is possible that the Nile was preferred to reach Nubia, thanks to the presence of the Nubian fortresses,⁷⁰ though this cannot be said with certainty, as the traces visible on the desert routes are not always indicative of their actual use.⁷¹

Also from Kharga Oasis it was possible to reach further south into Nubia, through the continuation of the Darb el-Arbain (see Map 1).⁷² Concerning Kharga Oasis, at Umm Mawagir a site dating both to the Late Middle Kingdom and the Second Intermediate Period was discovered, which, as hypothesized by the excavators, probably formed an independent territory with Dakhla Oasis during that time. This is suggested firstly by the similarity in the characteristic local pottery found at the two sites, which mixes shapes and decorations from pottery of the Late Middle Kingdom and pottery produced in the Theban area during the Seventeenth Dynasty (see Chapter 3). Secondly, at Umm Mawagir communal baking activities were intensively conducted, as shown not only by a communal bakery area, with structures of communal use where fires would be lit, but also by the grinding stones, used to grind wheat into flour, and the pottery moulds, where the dough of the bread would be baked in, excavated there. This shows the presence of an administration that for a short span of time, suggested by the dating of the finds, was organized enough to arrange the production of surplus food, thus engaging in trading activities that would make at least part of the population self-sufficient.⁷³ Based on the fact that a similar bakery area has been excavated at Ain Asil, in-

66 Colin, Laisney, and Marchand 2000.

67 The Abu Ballas trail is discussed in: Förster 2007; Förster 2013; Riemer 2007; Hendrickx, Förster, and Eyckerman 2013.

68 Förster 2007; Förster 2013; Hendrickx, Förster, and Eyckerman 2013.

69 The inscription is discussed in: Förster 2013.

70 Förster 2013, 320.

71 Förster 2013, 331; Hendrickx, Förster, and Eyckerman 2013, 374.

72 Bubenzer and Bolte 2013, 61–64 and 74; Rossi and Ikram 2013.

73 Darnell and Manassa Darnell 2016; Darnell and Manassa Darnell 2019; Manassa 2012.

dicating that similar activities were conducted in Dakhla Oasis, the excavators of Umm Mawagir have suggested the possibility that the two oases belonged to a territory that was (semi-)independent from the central power.⁷⁴

Even though the described hypothesis needs further research to be confirmed, it is in line with the findings of the present work because, all in all, contacts between different areas of Egypt were still going mostly through the Nile and not through the desert. Even though Ain Asil had contacts with several areas in the Nile Valley, these contacts are weak and created only by a few types of beads, which come from foundation deposits or pottery. This means that these beads were considered special enough to be offered and that, consequently, also the contacts bringing the beads there were rare. In addition, other objects, such as stone vessels, which are more difficult to transport, do not create connections between Dakhla Oasis and the Nile Valley. This means that only small and easily movable objects such as beads, which could easily be carried even by one single person, reached Dakhla Oasis, while objects whose transport required more effort did not.

Uniform material culture

As far as beads, scarabs, and stone vessels are concerned, many sites appear more important in the networks when their full range of types is considered. The main types of objects – that is, the more common objects – have more weight in the analysis when only the types shared between sites are considered. However, this weight decreases when the full range of types – even the ones found only at a single site – is examined. As a result, sites that appear less important in the first analysis can acquire more importance in the second one when they share a large part of their types, even though the more common types form a minority. This implies, first, that these sites were not centres for the production and distribution of the more common types of objects and, second, that they had a similar range of objects and shared a similar material culture. This applies specifically to the sites of the Late Middle Kingdom, suggesting that they shared a mostly uniform material culture.

Concerning the imported pottery (i.e. the Cypriot and the Tell el-Yahudiyah vessels) and the local imitations, the picture is different. For these groups of objects, the results of the analyses of the shared types and of the full range do not differ significantly. This means that the sites do not share their range of objects, apart from the sites mostly involved in the circulation of the more common types. Therefore, these objects differ between sites, and are consequently indicative of more local variation or regionalization. The same applies

74 Darnell and Manassa Darnell 2016; Darnell and Manassa Darnell 2019; Manassa 2012.

also to the weapons unearthed for this period, which especially at sites such as Tell el-Dab'a imitated examples from the Levant.

Preliminary conclusions

For the Late Middle Kingdom, main sites have been detected all along the Nile Valley and especially in southern Upper Egypt. Their importance is likely due to their access to both the material resources and the major communication routes through the desert. The sites in Upper Egypt were important also in performing both administrative tasks, as shown by the architectural structures and sealings excavated there and discussed above, and cultic activities, as shown by the temples there. Nevertheless, the networks and the circulation of objects were controlled by the capital in the Memphis-Fayyum area, where the administration and the production of objects were centred. Contacts were present also with Dakhla Oasis, as shown by the results for Ain Asil, though these contacts were all in all weak and Dakhla Oasis probably belonged to an independent territory together with Kharga Oasis. In the Delta, the only site examined for the period is Tell el-Dab'a, which was involved mostly in the networks of objects imported from, or imitating objects found in, Cyprus and the Levant: the site was a hub where objects from other lands found their way to other sites in Egypt, especially in the area of the capital, but it was still under the control of the central administration.

The material culture was overall uniform as far as the objects made of stone are concerned. While the circulation of goods focused on the area of the capital, the raw materials and the objects still circulated through the country. Nevertheless, objects imported or imitating objects found outside Egypt (i.e. Tell el-Yahudiyah ware, Cypriot pottery, metal weapons, and beads of shell and bone), as well as imported materials (i.e. lapis lazuli, obsidian, and silver), created differences between the sites as far as their range of objects is concerned, causing local variations. To what extent these differences are due to contacts with foreigners, or even the presence of foreign communities is not easy to say, because of the difficulty in linking material culture and ethnicity, as explained above.

All in all, even if differences are visible and the more remote territories, such as the oases, had only looser contacts with the other areas, no such divisions are detected to hypothesize a strong regionalization such as in the Second Intermediate Period. The different sites and areas still appear to belong to a mostly uniform system and network, and to share a similar identity. Objects that can be connected to traditions other than the Egyptian one emphasize a different identity in sites located along borders, such as Tell el-Dab'a and Elephantine.

EARLY SECOND INTERMEDIATE PERIOD

In the Eastern Delta, Tell el-Dab'a was a main site in the networks of beads, stone vessels, scarabs, and weapons, as well as a main site and an intermediary site in the networks of Tell el-Yahudiyah pottery. Furthermore, it is the only site where Cypriot pottery has been retrieved. During both the Early and Late Second Intermediate Period, the site had access to material resources in the Sinai and the central part of Egypt, such as turquoise, rock crystal, steatite, haematite, and amethyst (see Chapter 13). Because of the political fragmentation, the mentioned resources were probably transported less often to Tell el-Dab'a than in the Late Middle Kingdom. Nevertheless, the objects excavated at the site attest to the presence of these materials there more than at other sites (see Chapter 13).

In addition, the fact that the more common types characterized the range of objects at Tell el-Dab'a suggests that they were produced there. This means that the circulation of materials and the production of types were not controlled by the capital in the Memphis-Fayyum area anymore. Tell el-Dab'a was an independent and thriving site at the time; cartouches on scarabs and on architectural elements suggest that it was ruled by the Fourteenth Dynasty (see Chapter 2). Furthermore, excavation has shown that the settlement areas became larger, and both the types of houses and the grave goods attest to an increasing social complexity and stratification.⁷⁵

The Memphis-Fayyum, Middle Egypt, and the Western Desert

Harageh, Ain Asil, and Qau el-Kebir have been detected as main sites in the circulation of beads respectively in the Memphis-Fayyum area, in the Western Desert, and in Middle Egypt. Concerning Ain Asil, the archaeological finds show both that the settlement was small during the Second Intermediate Period, and that its ties to the Nile Valley were weak.⁷⁶ Furthermore, the site probably belonged to an independent territory at the time, which included the oases of Dakhla and Kharga, as suggested by the similarities in pottery and in the activities attested by the finds excavated at Ain Asil and Umm Mawagir, as discussed above. The similarities detected by the present analysis, in the range of beads between Ain Asil and the sites in the Nile Valley, indicate the existence of connections, which could involve the use of the Darb el-Arbain (see Map 1), described above and connecting Dakhla Oasis with the area of Asyut. However, as discussed above, the fact that the contacts are created by

75 Bietak 1996.

76 Aufrère and Ballet 1990; Ballet 1987; Ballet 1988; Ballet 1990; Hope 1980; Hope 1983; Hope 1987a; Hope 1987b; Hope 1987c; Hope 1999; Marchand 2003; Marchand, Soukiasian, and Bourriau 2010.

beads, and that the beads examined from Ain Asil were mostly found inside pottery and in foundation deposits, suggests a special role attributed to these beads, and that no investment was made in exchanging objects other than easily movable ones. All in all, this shows that contacts between Dakhla Oasis and the Nile Valley existed, but they were not strong, and there was no investment in them. This is the same attitude visible in the Abu trail (see Map 1), described above and connecting Dakhla Oasis with Nubia, during the Second Intermediate Period. While pottery dated to the time has been retrieved from the trail, demonstrating its use, the small quantity of vessels shows that this use was not intensive, mostly for small-scale operations such as hunting or patrolling, and concerned only the part closer to Dakhla Oasis.⁷⁷

The role detected for Harageh shows that it had contacts with the other Egyptian sites both in the Nile Delta and in the Nile Valley, which could happen via the river, as well as with Dakhla Oasis, whose contacts with other sites have just been discussed. Given that pottery of the Second Intermediate Period has been found at Bahariya, in Qaret el-Tub, it is possible that the Darb el-Rayyan (see Map 1), described above and connecting Ain Bahariya with the western part of the Fayyum, was in use, as well as the Darb el-Wahat (see Map 1), described above and connecting the western and the eastern parts of the Fayyum. Moreover, if we accept the hypothesis that the Thirteenth Dynasty still reigned in the Memphis-Fayyum area,⁷⁸ the presence of a ruling class in the area explains not only the role detected for Harageh, but also the presence of objects of precious and imported stones such as turquoise or lapis lazuli, which for the period are further found only at Tell el-Dab'a (see Chapter 13).

The importance of Qau el-Kebir is demonstrated not only by the present analysis, but also by the many more beads, stone vessels, and scarabs discovered at the site, which were not included in the analysis because, though at least part of them could be dated to the Early Second Intermediate Period, their dating is not secure.⁷⁹ The role of Qau el-Kebir can be due to the fact that the wadi basins accessible from the area led to the mineral resources necessary to produce the objects examined in the present work (see Map 1), as discussed above about the sites in Middle Egypt during the Late Middle Kingdom. However, the role of the site can also be due to its being occupied by people of the Pan-grave culture.

These people are believed to be of Nubian origins, because of the similarities between their burial customs and grave goods and the ones found in Nubia (see Chapter 4). These similarities, especially as far as the pottery is concerned, particularly point to contacts with pastoralists cultures from Nu-

77 Förster 2007; Förster 2013; Hendrickx, Förster, and Eyckerman 2013.

78 Discussed in: Ilin-Tomich 2014.

79 Brunton, Gardiner, and Petrie 1930, 3–12.

bia.⁸⁰ People of the Pan-grave culture probably moved to Egypt from Nubia when the weakness of the central power made it easier to cross the borders between the two lands,⁸¹ even though it cannot be excluded that they had already relocated to Egypt and decided to prominently show their identity, leaving traces detectable in archaeological research, during times of political fragmentation.⁸² They appear to consist mostly of small groups, formed by families, and to be mainly pastoralists, but to be engaged also in other activities such as mercenaries,⁸³ which they performed for the Egyptian population to obtain resources.⁸⁴ This is indicated by the objects used as grave goods – e.g. bucrania, animal skin and weapons, but also flints and tools made of bone and stone – and by the usually small size of the cemeteries, as well as by the demographics of the deceased.⁸⁵

Pan-grave pottery of the time was found at Ain Asil⁸⁶ and at Qaret el-Tub,⁸⁷ as well as at the routes in the Theban Desert,⁸⁸ at Umm Mawagir,⁸⁹ at Elephantine and in the area around it,⁹⁰ where several stone quarries are located,⁹¹ at the quarries at Wadi el-Hudi, and at the harbour of Mersa Gawasis,⁹² which was active during the Middle Kingdom and was located on the Red Sea coast in Upper Egypt.⁹³ Even though it does not necessarily indicate the presence of groups of Pan-grave culture or their direct involvement with the mentioned sites, nonetheless indicates direct or indirect contacts with them. This suggests that groups of Pan-grave culture could, among other activities that they performed, be involved in a more direct or indirect way in the acquisition and circulation of resources. If this is the case, it can be expected that this function became more important in the Second Intermediate Period, when the political fragmentation made the circulation of resources more difficult and the use of middlemen more necessary. This seems confirmed by the role detected by

80 As argued in: De Souza 2019, 148-49; Liszka 2012a; Liszka 2015.

81 As argued in: Gatto 2014; Näser 2012; Näser 2013; Weschenfelder 2014.

82 As argued in: Liszka 2015.

83 De Souza 2013; De Souza 2019, 149-50; Liszka 2012a.

84 As argued in: Gatto 2014; Näser 2012; Näser 2013; Weschenfelder 2014.

85 De Souza 2013; De Souza 2019, 148-50; Liszka 2012a.

86 Baud 1997; De Souza 2019, III-II2; Hope 1980; Hope 1999; Marchand 2003, 120; Marchand, Soukiassian, and Bourriau 2010, 206-7.

87 Colin 2005.

88 Deborah Darnell 2002; Darnell and Darnell 1993; Darnell and Darnell 1994a; Darnell and Darnell 1994b; Darnell and Darnell 1995; Darnell and Darnell 1996.

89 Manassa 2012.

90 Gatto, Curci, and Urcia 2014; Giuliani 2013; Näser 2013; Raue 2018, 208-262.

91 Storemy et al. 2013a; Storemyr et al. 2013b.

92 Manzo 2012.

93 For the Pan-grave pottery from these sites see also: Gatto, Curci, and Urcia 2014; Weschenfelder 2014.

the present analysis for Qau el-Kebir, which becomes more important than in the Late Middle Kingdom.

Southern Upper Egypt

In southern Upper Egypt, Abydos was a main site in the network of scarabs, Hu was a main site in the network of weapons, Tod was an intermediary site in the network of beads, Edfu was a main site in the network of stone vessels and a bridging site in the network of beads. Furthermore, the importance of Abydos in the network of beads and stone vessels, and the importance of Tod in the network of stone vessels, both increase when the full range of types is examined.

This shows that the sites in southern Upper Egypt were, like in the Late Middle Kingdom, mostly involved in the circulation of beads, scarabs, and stone vessels. This is no doubt because the natural resources located in the southern part of Egypt, especially in the Eastern Desert, namely steatite, feldspar, serpentine, siltstone (numbers 19, 23, 27, 29, 31, 33 on Map 1) remained in use and were accessible from the Wadi Qena and the Wadi Hammamat, as well as from the wadi basins accessible from the area of Edfu (see Map 1) as described above. Moreover, it is possible that the desert routes described above, especially the routes connecting Edfu with Nubia through the Darb Bitan, the Luxor-Farshût road, and the other smaller routes in the Theban Desert (see Map 1), described above, were still in use. Connections between Edfu and Nubia are further demonstrated by the Nubian pottery, imported or locally imitated, excavated at Edfu.⁹⁴

The role of Abydos in the network of scarabs further suggests its importance as a site where goods were sealed, and therefore, stored and (re-)distributed from. Considering how scarabs were used also as grave god, it also suggests the participation of the people buried there in the common burial customs. Part of the objects excavated there were not included in the analysis, because their dating cannot be pinpointed to the Early or the Late Second Intermediate Period, so that it cannot be excluded that the importance of the site would appear even more clearly if those objects could be examined in closer detail.⁹⁵

The results for Edfu show that the site played a special role at the time. Its importance as a site where administrative tasks were performed, including the storage and (re-)distribution of goods, is shown by the large number of sealings, unearthed inside the columned halls of a large structure, as described above. However, these sealings could not be examined because their features

94 Ayers and Moeller 2012.

95 Moeller 2010.

have not been published in sufficient detail for the present research.⁹⁶ These sealings are also at the centre of the debate about the internal chronology of the Second Intermediate Period because they include sealings of the kings Sobekhotep IV, traditionally ascribed to the Early Second Intermediate Period, and Khayan, traditionally ascribed to the Late Second Intermediate Period, unearthed together in one of the two columned halls of the building (see Chapter 2). According to the excavators, the building with columned halls appears to still be used for administrative tasks during the earlier part of the Second Intermediate Period, before becoming a space for silos in the later part of the period.⁹⁷ Archaeological finds, including pottery and stelae, further indicate that Edfu was important in the communications between Lower and Upper Egypt in the Early Second Intermediate Period.⁹⁸

At the same time, the roles of Tod and Hu could be explained by the role played by communities of the Pan-grave culture, whose people were buried in the cemeteries at these sites. The importance of people of Pan-grave culture has been discussed above and can explain the contacts detected between these sites and Tell el-Dab'a, where the pottery unearthed is similar to those found in Nubia and indicates contacts with, or the presence of, Nubian people.⁹⁹ This lends further credence to the idea that people of Pan-grave culture and people from Nubia were involved, in a more direct or indirect way, in the communications between different sites in Egypt at this time.

Preliminary conclusions

During the Early Second Intermediate Period, the site with the higher number of connections is Tell el-Dab'a in the Eastern Delta. At the same time, Harageh in the Memphis-Fayyum area, Qau el-Kebir in Middle Egypt, and Ain Asil in the Western Desert show contacts mostly through the types of beads shared. After attaining its independence from the central administration in the Memphis-Fayyum area, Tell el-Dab'a – probably under the rule of the Fourteenth Dynasty – flourished and was not merely a hub for importing products into Egypt and distributing them, especially to the capital area in the Memphis-Fayyum, as described above for the Late Middle Kingdom. Instead, it became a nodal point for the networks involving products locally made. As shown by the present analysis, the site was able to obtain the necessary resources and to produce and distribute the more common types of objects. Considering the political fragmentation, it is possible that Tell el-Dab'a could

96 Moeller 2012; Moeller, Marouard, and Ayers 2011.

97 Ayers 2018; Moeller 2010.

98 Ayers 2018; El-Sayed 1979; Moeller 2010; Moeller, Marouard, and Ayers 2011.

99 Aston and Bietak 2017; De Souza 2019, 109-111; Forstner-Müller and Rose 2012.

acquire these resources in smaller amounts and less frequently than in the Middle Kingdom, but the objects found at the site show that acquisition was nonetheless still happening.

There were still contacts between Lower Egypt, Middle Egypt, the Memphis-Fayyum area, and Dakhla Oasis. However, the latter probably belonged to a separate territory, and the mentioned contacts between the different areas were not necessarily strong. These contacts could even have been created by only few people, considering that they are shown mostly by beads, thus objects whose transport did not require any effort and could be easily carried by a single person. In southern Upper Egypt, the role detected for Abydos and Edfu further demonstrates that connections between Lower and southern Upper Egypt still existed during this period. However, the analysis of materials (Chapter 13) has shown that materials from the southern part of Egypt, especially from the Eastern Desert, were only partially exploited and at most reached Harageh. This also demonstrates that the use of communication routes was more difficult.

At the same time, Tod and Hu were active in relations involving people from Nubia and, through them, had contacts with Tell el-Dab'a. This, together with the role detected for Qau el-Kebir, confirms the role played by people from Nubia in Egypt during the Early Second Intermediate Period. This role could concern an involvement in the communications between different areas, in the circulation of resources, and in the desert routes, even though only part of these desert routes seems to have been in use, and not in an intensive way.

To conclude, the present analysis has revealed that, during the Early Second Intermediate Period, communications and connections existed between different areas of Egypt, and goods still circulated, and that people of the Pan-grave culture acquired some importance. It should be mentioned that the number of contexts included in the analysis of the Early Second Intermediate Period is considerably smaller than the number of contexts included in the analysis of the other two periods and that, therefore, the results should be taken with caution. However, contextualizing the described results in the general archaeological framework helps gaining more nuance and a better perspective on the Early Second Intermediate Period and on the contacts happening then, which were active but not intensive.

All in all, the material culture appears more differentiated than during the Late Middle Kingdom, because of the types of objects in common between the sites are proportionally fewer, compared to the overall amount of types of objects examined. This indicates that a regionalization process is visible through the small finds. The main contacts detected between Tell el-Dab'a, Harageh, Qau-el Kabir, Abydos, and Ain Asil could suggest that these were

main sites of different territories, through which these territories were in contact. While archaeological and literary evidence indicate that Tell el-Dab'a and Dakhla Oasis did belong to different territories, as previously discussed, this cannot be said with certainty for the other sites. Only if one accept Ilin-Tomich's hypothesis,¹⁰⁰ then Haragheh would also belong to a different territory.

LATE SECOND INTERMEDIATE PERIOD

In the Delta, Tell el-Dab'a has been detected as a main site in all the networks but the ones of stone vessels; in the network of Tell el-Yahudiyah ware, Tell el-Dab'a has been detected also as an intermediary. Among the other sites of the Delta (all located in the eastern part of the Delta), Tell el-Maskhuta was a main site in the network of weapons, Tell el-Yahudiyah was a main site in the network of scarabs and Tell el-Yahudiyah ware, and Tell Hebua was a main site and an intermediary in the network of stone vessels, as well as an intermediary in the network of beads. When the full range of types is considered, Tell Hebua becomes only an intermediary in the network of stone vessels, while Tell el-Yahudiyah appears as a main site in the network of weapons, Tell el-Retaba becomes an intermediary in the network of scarabs, and Tell el-Maskhuta becomes a main site in the networks of beads and scarabs.

The role detected for Tell el-Dab'a in the different networks is related to two factors. The first one is the access to the materials, especially the ones found in the Sinai and the central part of Egypt (i.e. turquoise, rock crystal, steatite, calcite-alabaster, haematite, and amethyst, numbers 1–16 on Map 1), which is shown by the objects excavated at the site (see Chapter 13). Moreover, at Serabit el-Khadim, in the Sinai, sherds of Tell el-Yahudiyah ware¹⁰¹ and scarabs similar to the ones from at Tell el-Dab'a¹⁰² have been found, which attest to contacts between Tell el-Dab'a and the Sinai. The second factor is the range of objects characterized by the most common types, more than any site in the Delta, which suggests that these types were produced at Tell el-Dab'a itself. These factors can be ascribed to the role of the site as a capital at the time, under the rule of the Hyksos Dynasty.¹⁰³ Tell el-Maskhuta and Tell el-Yahudiyah were the other main sites. Given that the objects found at those sites resemble the ones found at Tell el-Dab'a, it has been suggested that they were all part of an area that shared a similar material culture (see Chapter 3). Tell el-Maskhuta, conveniently located along a canal connecting Egypt with the Si-

100 Ilin-Tomich 2014.

101 Givon 1978, 61; Mumford and Parcak 2003, 87–88.

102 Mumford and Parcak 2003, 87–88.

103 Bietak 1996.

nai¹⁰⁴ and the mines there (numbers 1–3 on Map 1),¹⁰⁵ was a settlement where goods exchanged between Egypt and the Levant were traded.¹⁰⁶ The richly furnished tombs excavated at the site attest to the presence of a wealthier class at the site;¹⁰⁷ the scarabs and beads found there, which puts the site among the main sites when the full range of types is considered, reinforce this interpretation and suggest that the deceased were involved in administrative tasks, involving the storage and (re-)distribution of goods and documenting the related processes. There is also evidence at the site for metalworking,¹⁰⁸ which no doubt explains why the site is a focal point for weapons, which were found in the richest tombs. Tell el-Yahudiyah, where both a settlement and burials have been excavated, was characterized by earthen embankments, which were parts of walls,¹⁰⁹ as well as by weapons, especially from the richer tombs,¹¹⁰ and scarabs, both from tomb and settlement contexts.¹¹¹ The role of the site in the network of scarabs shows that goods were sealed and, therefore, stored and (re-)distributed from there, and how the people buried there were participating in burial customs similar to the ones found at other sites, while the role in the networks of Tell el-Yahudiyah ware, which was originally of Levantine origin before being locally produced in Egypt (see Chapter 10) and weapons, which are similar to the ones found in the Levant (see Chapter 12), show that the site had rich burials whose burial goods remind one of those in the Levant. Nevertheless, the weapons were likely not produced here, which is why the most common types do not form most of the range of types.

The two intermediary sites detected in the Delta are Tell Hebua and Tell el-Retaba. Tell Hebua is believed to be a site where goods moved between Egypt and the Levant, mostly food, were stored, as shown by the presence of silos and granaries.¹¹² At Tell el-Retaba, tombs and a settlement have been excavated.¹¹³ The material culture unearthed there has a style similar to the one found at Tell el-Dab'a. Not sufficient archaeological data have been published to understand the role of the site, though its geographical position, in the Wadi Tumilat near Tell el-Maskhuta, allows us to postulate a role in the trade leading from the Sinai to Tell el-Maskhuta and, from there, further into Egypt.

104 Redmount 1995b.

105 The involvement of the site in the routes to the mines in the Sinai is discussed in Mumford and Parcak 2003.

106 Holladay Jr. 1980; Holladay Jr. 1997.

107 Redmount 1989.

108 Holladay Jr. 1997, 195–96.

109 Petrie and Duncan 1906, 1–10.

110 Petrie and Duncan 1906.

111 Adam 1958; Griffith 1890; Petrie and Duncan 1906.

112 Maksoud 1998.

113 Holladay Jr. 1997; Rzepka et al. 2009; Rzepka et al. 2014.

The Memphis-Fayyum area

In the Memphis-Fayyum area, Sedment was a main site in the networks of beads, stone vessels, and scarabs. When the full range of types is analysed, Tarkhan and Sedment become main sites in the network of Cypriot pottery, while Harageh becomes a main site in the network of Tell el-Yahudiyah ware.

The role detected for Sedment can be due to its location at the south-eastern entrance to the Fayyum, which gave access to the desert routes.¹¹⁴ In detail, the Darb el-Wahat and the Darb el-Rayyan (see Map 1), both described above, could be used. The first route connected the south-eastern part of the Fayyum, from the area of Gurob, which is near Sedment, to the south-western part of the Fayyum, while the second route connected the western part of the Fayyum to the area of Ain Bahariya in Bahariya Oasis. Bahariya Oasis was inhabited at the time and in close contacts with the Hyksos, as suggested by pottery excavated at Qaret el-Tub, near Ain Bahariya, which is similar to the pottery found at Tell el-Dab'a.¹¹⁵ The suggested hypothesis regarding Sedment is further supported by the fact that the site was in contact with southern Upper Egypt too, as demonstrated by the presence of obsidian, which for the Late Second Intermediate Period is found only in southern Egypt (see Chapter 13). Moreover, both the types of Cypriot pottery from Tarkhan, in the north-eastern part of the Fayyum, and the types of Tell el-Yahudiyah ware from Harageh, in the south-eastern part of the Fayyum near Sedment, have similarities mostly with Tell el-Dab'a, and partially with Sedment. This suggests contacts between this group of sites in the Fayyum and Tell el-Dab'a. Lastly, the present analysis has detected connections, though not strong, between Sedment and Ain Asil, which suggests that both Sedment and Dakhla Oasis could be part of the route used to reach south.

Middle Egypt

In Middle Egypt, Mostagedda and Qau el-Kebir were main sites in the network of beads, stone vessels, and weapons. Furthermore, Mostagedda was an intermediary in the network of weapons. When the full range of types is considered, Rifeh becomes a main site in the networks of scarabs and Tell el-Yahudiyah ware, while Mostagedda becomes a main site in the network of scarabs, and Matmar become a main site in the networks of beads and stone vessels.

Mostagedda and Qau el-Kebir are known for their Pan-grave cemeteries and belonged to the same cultural area, as shown by the similar objects retrieved from there (see Chapter 3). It is also believed that the members of the

¹¹⁴ Agut and Moreno-García 2016, 293.

¹¹⁵ Colin 2005; Colin, Laisney, and Marchand 2000.

Pan-grave culture from the cemetery at Mostagedda served the kings ruling from Thebes, strengthening their connections to the area, as suggested by the similarity in pottery between Mostagedda and Thebes.¹¹⁶ This is confirmed by the present analysis, which has detected contacts between Thebes and Mostagedda; the results also demonstrate the importance of the Pan-grave people buried at this cemetery during this period. Nevertheless, the analysis also shows that the people from both Qau el-Kebir and Mostagedda had strong contacts with Tell el-Dab'a. Qau el-Kebir and Mostagedda were located in an area with access to wadi basins that led to the stone sources found in the central part of the Eastern Desert, such as steatite, calcite-alabaster, haematite, and amethyst (number 13–16 on Map 1), which are used for most of the stone objects of the time unearthed in Lower Egypt (see Chapter 13). The pottery and the scarab,¹¹⁷ and the royal stelae of the Late Second Intermediate Period at the galena mines at Gebel el-Zeit (number 14 on Map 1),¹¹⁸ all mentioned above, further indicate that resources in the central Eastern Desert were still exploited at the time, by rulers of both Lower and Upper Egypt. Considering what has been said about Mostagedda, it is possible that the people whose tombs are at this site were involved in the related operations. Moreover, Mostagedda, Tell el-Dab'a, and Balabish are the only sites connected through similar objects when materials found in the southern Eastern Desert are considered (see Chapter 13). Therefore, it is possible that the people of Pan-grave culture living there were at least partially involved, in a direct or indirect way, in the acquisition and circulation of the aforementioned resources. The military importance of the communities buried at these sites is further demonstrated by the role they played in the network of weapons, as already discussed about Tell el-Dab'a and Mostagedda and will be discussed about Balabish in the next section.

Of the other two sites located in Middle Egypt, Matmar is believed to be a cemetery for people of lower class, on the basis of the grave goods excavated at the site.¹¹⁹ This is confirmed also by the results of the analysis, which show that the site shared part of its types, but not the main ones: this means that the main types were not produced and distributed from there, but received from somewhere else. Considering that Matmar shares most types with Qau el-Kebir and Mostagedda, it can be suggested that the community buried there

116 Bourriau 1997, 167–68; Bourriau 2010, 22–23; De Souza 2019, 49–50.

117 Cherpion and Buchez 2007, 56–57.

118 Marée 2009. Marée attributes the royal names to kings of the Sixteenth and Seventeenth Dynasties. While the exact attribution of these kings (especially the ones of the Sixteenth Dynasty) is beyond the scope of the present work, it is however relevant that the stelae are dated to the Late Second Intermediate Period.

119 Brunton 1948.

was controlled by these other Pan-grave communities. Nevertheless, the fact that the site shares many scarabs and seal designs with the Eastern Delta (see Chapter 9) demonstrates that there were links between Matmar and the Hyksos kingdom. One possibility is that these contacts implied the exchange of goods, given that scarabs and seals were used to seal goods and commodities during their transportation and storage, as described earlier. At the same time, Rifeh is believed to be occupied by people of the Pan-grave culture working for the Hyksos.¹²⁰ The shared types of Tell el-Yahudiyah ware and scarabs confirm contacts between Rifeh and the Eastern Delta, especially Tell el-Dab'a and Tell el-Yahudiyah. The other objects shared by the site show weaker links with the other major sites occupied by communities of the Pan-grave culture, namely Mostagedda and Qau el-Kebir. In general, Rifeh shares most types of objects with sites in the Eastern Delta. The range of types found at Rifeh is not characterized by the more common types, which suggest that the community using the cemeteries at the site, like in the case of Matmar, was not engaged in producing and distributing the main types of objects. Along with its connections to the Eastern Delta, this seems to confirm that the site was controlled by the Hyksos.

Southern Upper Egypt

Among the sites in southern Upper Egypt, Balabish was a main site in the network of weapons, while Abydos was an intermediary site in the networks of scarabs and Cypriot pottery, and Thebes was a main site in the networks of beads and stone vessels. When the full range of types is examined, Abydos becomes a main site in the networks of beads and Tell el-Yahudiyah ware, while Hu becomes a main site in the networks of beads and stone vessels, and Balabish becomes a main site in the network of beads.

Remarkable is the isolation of Elephantine, which does not establish any contact during the Late Second Intermediate Period. This isolation can be due to a bias in the data published and analysed in the present work, given that only the settlement could be considered, and that pottery was not examined. Nevertheless, the described results can also reflect reality and show that Elephantine, from which Nubia could be accessed both via desert routes starting from the area of Aswan, as discussed above,¹²¹ and via the Nile, was a separate territory, or that at least it had closer contacts with Nubia than with the rest of Egypt. Strong contacts with Nubia and the presence of Nubian groups are suggested by the pottery imported from Nubia and its local

120 Bourriau 1997, 167-68; Bourriau 2010, 22-23.

121 For these routes: John C. Darnell 2004; Storemyr et al. 2013a.

imitation retrieved from Elephantine and the area around it.¹²² Moreover, an inscribed seal, made of fired clay and featuring a raised relief, mentioning a “Ruler of Kush” has been found at Elephantine, in the stratum corresponding to the Late Second Intermediate Period.¹²³ The Kerman origins of this seal are indicated by the unusual material, orthography and technique, and attest to diplomatic relations with Nubia,¹²⁴ or at least that a Nubian ruler was influential enough to have a seal there.¹²⁵ In addition, written sources, especially the so-called Second stela of Kamose,¹²⁶ mention that contacts between the Hyksos rulers and Nubia went via the oases during this time, as confirmed also by previous archaeological research at Bahariya.¹²⁷ Therefore, Elephantine had contacts with Nubia, but was not mediating between the latter and Egypt. While suggesting a Nubian influence can be too far-fetched given the available material, Elephantine should be at least acknowledged as a place where a mixed Egyptian and Nubian community lived, at the frontier between Egypt and the Kingdom of Kerma (mentioned in Chapter 10).¹²⁸

Balabish is known for its cemetery of people of the Pan-grave culture.¹²⁹ The types of objects it shared connect it mostly to other sites with communities of the Pan-grave culture and with Tell el-Dab’a. Therefore, it is possible that the community buried at the cemetery at Balabish was probably controlled by the Hyksos, or at least that it established close contacts with Tell el-Dab’a. Furthermore, the absence of scarabs, the range of beads not characterized by the main types, and the role in the network of weapons suggest that the community of Pan-grave culture occupying Balabish was probably mostly playing a military role.¹³⁰ Moreover, the types of weapons found at Balabish are in common with other sites where communities of Pan-grave culture were present. This suggests that the weapons are indicators both Pan-grave identity of this community and of the role that this community played. Furthermore, as already mentioned, the fact that Balabish, Mostagedda, and Tell el-Dab’a are the only sites connected when objects of materials found in the southern Eastern Desert are examined, suggests that the people of Pan-grave culture

122 Gatto, Curci, and Urcia 2014; Giuliani 2013; Näser 2013; Raue 2018, 208–262.

123 Cooper 2018; Fitzenreiter 2012; Von Pilgrim 2015.

124 Von Pilgrim 2015.

125 Fitzenreiter 2012.

126 Discussed in: Dirminti 2014, 242–243; Enmarch 2013, 56–63; Flammini 2012; Ḥabaṣī 1972; O’Connor 1997; Redford 1997, 68–69; Säve-Söderbergh 1956; Smith and Smith 1976.

127 Colin 2005.

128 As discussed in Fitzenreiter 2012; O’Connor 1984; Raue 2018, 208–262.

129 Wainwright and Whittemore 1920.

130 De Souza 2019, 149–50.

occupying these sites were at least partially involved, in a direct or indirect way, in the acquisition and circulation of the resources.

The results detected for Abydos show that it mainly had the role of connecting the sites in Lower and Middle Egypt to the sites in southern Upper Egypt (see Chapter 13). The types of objects that the site shared, especially the Tell el-Yahudiyah ware and the Cypriot pottery, show that it was in contact mostly with Lower Egypt and the Memphis-Fayyum area, while the types of beads and scarabs shared show that it was in contact with sites in Middle Egypt. Hu, like Abydos, shared more objects with Tell el-Dab'a and with the sites in Middle Egypt, especially Qau el-Kebir and Mostagedda, than with Thebes, though Thebes shared more objects with Hu than with Abydos. The described situation, and the fact that Abydos and Tell el-Dab'a are linked mostly through shared types of Cypriot pottery and Tell el-Yahudiyah ware, which are more common in Lower Egypt, both suggest that Abydos had close contacts with Tell el-Dab'a, or that it was even under Hyksos influence. At the same time, the links created by the shared objects between Abydos and Hu are not strong. While on one side this can be due to the fact that part of the data for Hu are missing in the analysis because the publications provide limited details on the objects unearthed at the site, it also shows that the two sites were more in contact with Tell el-Dab'a and Middle Egypt than with each other. All in all, the sites seem to have established separate networks, through separate communication routes.

From Abydos, Rifeh could be reached via the river, which seems to be suggested also by connections revealed by the present analysis between the two sites. As discussed above, Rifeh was under Hyksos influence, therefore Abydos, whose contacts with Thebes have been detected by the present analysis, could have bridged the area under the Theban rulers and the area under the Hyksos rulers. From Hu, Kharga Oasis could be reached through the Girga road (see Map 1), described above. Excavations at Abu Ziyâr and Tundaba have found outposts with ostraca, seal impressions, pottery, a cistern, and dry-stone structures of the Late Second Intermediate Period, as mentioned above. These finds have also stylistic affinities with the Seventeenth Dynasty, which shows that the route was intensively used by the Theban rulers.¹³¹ From Kharga, Dakhla Oasis could be reached in its eastern part, between Ain Asil and Teneida, through the Darb el-Ghubbari and the Darb Ain Amur (see Map 1), described above. Connections, though weak, detected between Hu and both the Theban area and Ain Asil, further suggest that the community buried at Hu could be a part of the communication network between the Theban area and the oases of the Western Desert. However, it is interesting that

131 Deborah Darnell 2002; John C. Darnell 2002; Darnell and Darnell 2002; Darnell and Darnell 2013.

no direct contacts between Thebes and Ain Asil have been detected. This will be discussed below. All in all, Abydos and Hu could belong not only to two different networks, but also to different territories. The fact that the range of types, from both Abydos and Hu, is not characterized by the more common types implies that the communities occupying these sites did not produce and distribute them and, therefore, that they probably received them from other places.

In the case of Hu, the shared objects, as explained above, suggest that people buried there had close contacts with, or was even under the influence of, the communities of Pan-grave culture found at Qau el-Kebir and Mostagedda; at the same time, the shared objects show that the site was in contact with Thebes. Abydos is known to be a part of the Theban kingdom during the Seventeenth Dynasty, as shown by royal stelae, and by stelae from officials working for the Theban rulers, unearthed at the site,¹³² and to be located at the frontier.¹³³ Regarding the earlier part of the Late Second Intermediate Period, stelae that can be dated to this phase have been found at Abydos, but have been interpreted in different ways, especially the stela belonging to King Sekhemraneferkhau Wepwawetemsaf. While Ryholt has ascribed the mentioned king, not attested in the Turin Canon, and his stelae to the Abydos Dynasty,¹³⁴ Marée has found stylistic similarities with stelae of what are considered early rulers of the Seventeenth Dynasty. Therefore, he has ascribed the mentioned king and his stelae to the late Sixteenth–early Seventeenth Dynasty, and placed Abydos under Theban influence, rejecting Ryholt’s idea of an independent territory in Abydos.¹³⁵ Nevertheless, the results of the present analysis suggest that Abydos was in close contacts with the Hyksos. These results are in agreement with Ryholt’s theory that, during the first part of the Late Second Intermediate Period, Abydos belonged to the kingdom of the so-called Abydos Dynasty and was soon conquered by the Hyksos, and ultimately taken over by the Seventeenth Dynasty, while Hu belonged to the kingdom of the Sixteenth Dynasty.¹³⁶

Moreover, the routes passing through the Theban Desert and connecting the southern side of the bend with the northern side (see Map 1), all described above, were mostly in use during the Late Second Intermediate Period. A chapel of the Seventeenth Dynasty at the Gebel Antef¹³⁷ and pottery from both

132 These are discussed in: Franke 1985; Ilin-Tomich 2014; Kubisch 2008; Marée 2010; Ryholt 1997, 171–74.

133 Ryholt 1997, 171–74.

134 Ryholt 1997, 163–166.

135 Marée 2010.

136 Ryholt 1997, 301–310.

137 Darnell and Darnell 1993; Darnell and Darnell 1994a; Darnell and Darnell 1994b; Darnell and Darnell 1995; Darnell and Darnell 1996; Darnell and Darnell 2002.

the Gebel Antef and the Wadi el-Hôl demonstrate the intense use of the main Luxor-Farshût route (see Map 1) by the Seventeenth Dynasty; graffiti datable to the same period have also been found.¹³⁸ The Darb Ba'irat (see Map 1) and the trail behind the Thoth mountain were also used by the Seventeenth Dynasty, though not intensively,¹³⁹ while the mud-brick towers with pottery of Second Intermediate Period, as well as graffiti possibly dating to the same period, discovered on the 'Alamat Tal road (see Map 1) show an intensive use by the same rulers.¹⁴⁰

The roles detected for Thebes are probably due to the fact that the territory of the Seventeenth Dynasty was centred in the Theban area, as suggested by royal names attested on stelae and architectural elements.¹⁴¹ The Sixteenth Dynasty was probably also centred at Thebes, but there is still discussion on which kings to ascribe to this dynasty (see Chapter 2), therefore also their capital is not certain yet. The present analysis shows that Thebes shared the highest number of objects with Mostagedda, which can be expected based on what has been discussed above about the situation in Middle Egypt. To a lesser degree, Thebes shared objects with Sedment and Tell el-Dab'a, as well as Hu. It can be noticed that Thebes had contacts mostly along the Nile Valley, and even a few with the Eastern Delta. The only activities in the Western Desert attested for the Seventeenth Dynasty concern Kharga Oasis, at Umm Mawagir, and the Girga road (see Map 1), namely the road between Hu and Kharga Oasis, at Tundaba and Abu Ziyar, as discussed above. The described situation shows that, though the Theban rulers invested in activities in the southern part of the Western Desert, they mostly used the Nile to reach sites under their influence, such as Mostagedda. The fact that no connections have been detected between Thebes and Ain Asil, while a weak connection existed between this latter and Hu, as mentioned above, further suggests this hypothesis. In the Eastern Desert, activities by these rulers in the central part are attested by the royal stelae at the mines at Gebel el-Zeit (number 14 on Map 1), mentioned above. Considering the connections between Thebes and Mostagedda, it is possible that the site was involved in these activities. Lastly, the objects shared by Thebes are mostly beads and stone vessels. While these objects indicate exchanges of objects and goods, they do not imply common burial customs, as in the case of the scarabs and the weapons used as burial equipment (see Chapter 12), nor that goods were stored and (re-)distributed

138 Darnell and Darnell 1993; Darnell and Darnell 1994a, Darnell and Darnell 1995.

139 Darnell and Darnell 1993; Darnell and Darnell 1994a; Darnell and Darnell 1994b; Darnell and Darnell 1995; John C. Darnell 2002.

140 Darnell and Darnell 1993; Darnell and Darnell 1994a; Darnell and Darnell 1994b; Darnell and Darnell 1995; Darnell and Darnell 1996; John C. Darnell 2002.

141 Ryholt 1997, 388–391.

from there, as in the case of scarab and seal impressions (see Chapter 9). The objects mostly shared by Thebes neither include Tell el-Yahudiyah ware and Cypriot pottery, hence they do not indicate contacts with Levantine or Cypriot communities, nor the presence of these communities, nor that their products, and especially their pottery, was valued and (re-)used (see Chapters 10 and 11). Therefore, the connections established by Thebes with Lower Egypt further support that the two areas belonged to different territories and attest to different material cultures.

The oases

In the northern part of the Western Desert, the oasis of Bahariya shows connections with the Hyksos, as suggested for example by the pottery excavated at Qaret el-Tub.¹⁴² At the same time, the oases of the southern part of the Western Desert, namely Dakhla and Kharga, were probably part of an independent territory, as suggested by the similar pottery and settlement structure, and by the production activities conducted at Umm Mawagir, as discussed in the previous sections. It can also be noticed that Ain Asil shares mostly scarabs and imitated Cypriot pottery with the sites in the Eastern Delta. Though the links are few and, therefore, the contacts are weak, they still are present and focus on the territory controlled by the Hyksos.

Considering the connections, mentioned above, between Ain Asil and Sedment, and between Sedment and the sites in the Eastern Delta, the described situation suggests the influence on the desert by the Hyksos. Moreover, the connections detected by the present analysis between Ain Asil and the sites in Middle Egypt, though weak, suggest that contacts could have passed through Darb el-Tawil (see Map 1), linking the eastern part of Dakhla Oasis and the area around Asyut, as described above.

Preliminary conclusions

During the Late Second Intermediate Period, Tell el-Dab'a is the most important site detected for the Delta, where other sites playing a major role are Tell el-Maskhuta and Tell el-Yahudiyah. Tell el-Dab'a was the capital of the Hyksos, while at Tell el-Maskhuta and Tell el-Yahudiyah, the upper echelons of society included the presence of, or contacts with, people of Levantine origins, who were dependent on the rulers at Tell el-Dab'a, as shown by their similar material culture. These sites gained importance in the trading, storage and (re-)distribution of goods under Hyksos rule. Other sites, such as Tell Hebua and

142 Colin 2005; Colin, Laisney, and Marchand 2000.

Tell el-Retaba, became important as intermediary places for communications between Egypt and the Levant.

The use of the desert routes is shown by the sites in the Memphis-Fayyum area, especially Sedment, whose contacts, though weak, with Dakhla Oasis have been detected by the present analysis. The result of the present analysis show that the community buried at Sedment played a role on these routes and was in contact with both Lower and southern Upper Egypt. The similarities between Tarkhan, and Harageh and Tell el-Dab'a also show that the Fayyum was especially in contact with the Eastern Delta, thus with the territory controlled by the Hyksos. Bahariya Oasis, in the northern part of the Western Desert, also seems to be under Hyksos influence, while the oases in the southern part of the Western Desert appear to belong to a separate territory.

At the same time, Middle Egypt was also an important node in contacts and trade, especially through routes through Qau el-Kebir and Mostagedda, which had strong contacts with both Lower and southern Upper Egypt. The location of these sites, with access to mineral resources, and the fact that these sites are characterized by the presence of communities of the Pan-grave culture shows the involvement of these communities, in a more direct or indirect way, in the acquisition and circulation of these resources. The communities buried at Matmar and Rifeh were also important and had contacts with both Lower and southern Upper Egypt, but they were respectively controlled by the Hyksos and by the communities of Pan-grave culture occupying Qau el-Kebir and Mostagedda.

In southern Upper Egypt, the Theban area was of great importance, due to its being the area of the capital of the Seventeenth Dynasty, and possibly of the Sixteenth Dynasty. As visible in the pottery and in the burial goods, these dynasties, and especially the Seventeenth Dynasty, ascended to power in the area and needed to legitimize themselves, to promote unity in their own territory and set themselves apart from other territories (see Chapter 3). Other important sites were Hu and Abydos, which maintained contacts with both Lower and southern Upper Egypt and through which the resources from the main wadis of the southern Eastern Desert were probably channelled. Hu was probably under the control of, or at least had close contacts with, the Theban rulers and played an important role as a hub on the desert routes connecting with the oases in the southern part of the Western Desert, especially through the Girga Road (see Map 1), in which the Theban rulers had an interest, the Darb el-Ghubbari, and the Darb Ain Amur (see Map 1). At the same time, Theban rulers were able to organize expeditions in the central Eastern Desert, probably involving the Pan-grave community whose cemetery is located at Mostagedda. Abydos had stronger contacts with the Hyksos, as shown by the Tell el-Yahudiyah ware and the Cypriot pottery. A possible explanation is

that the results give an image of the political situation at the beginning of the Late Second Intermediate Period, when the site was likely controlled by the Hyksos.

Lastly, the isolation of Elephantine can be due to archaeological bias or reflect an actual situation. On one side, the analysis of pottery suggests that the island could be a separate territory¹⁴³ and show strong contacts with Nubian groups or even their presence there;¹⁴⁴ these strong contacts are further shown by the seal of possible Kerman origins mentioning the “Ruler of Kush”.¹⁴⁵ On the other side, textual sources, such as the Kamose stela, indicate that the desert was used as a corridor between the Hyksos territory and Nubia,¹⁴⁶ and that Elephantine was not involved in the contacts between Egypt and Nubia during the Late Second Intermediate Period. All this suggests that Elephantine was a place inhabited by a mixed Egyptian and Nubian population, at the frontier between Egypt and the Kingdom of Kerma, with close contacts with Nubia but not with other regions in Egypt.¹⁴⁷

To conclude, the analysis has detected the following areas, associated by the material culture: the Eastern Delta, the oases in the southern part of the Western Desert (Dakhla and Kharga), Upper Egypt, and the area of Elephantine. The sites in the Memphis-Fayyum area and Bahariya Oasis were mostly in contact with the Hyksos, possibly under their influence, and gave access to the desert routes. The sites in Middle Egypt, from Rifeh to Abydos, were acting as border and were in contact with both Lower Egypt and the rest of Upper Egypt.

GENERAL CONCLUSIONS

During the Late Middle Kingdom, the results of the present analysis and the distribution of materials (see Chapter 13) show the activity of a centralized administration located in the capital area in the Memphis-Fayyum area, which controlled the circulation of materials. It was also a key production and distribution centre for the main types of objects, which were moved mostly through the Nile Valley and partially through the Western Desert. The material culture was generally uniform, and materials reached also areas located further away from their sources. The small variations do not suggest a regionalization process as during the Late second Intermediate Period. However, differences are visible in groups of objects that suggest the presence of or contacts with for-

143 Bourriau 1997, 159; Bourriau 2010, 12.

144 Gatto, Curci, and Urcia 2014; Giuliani 2013; Näser 2013; Raue 2018, 208–262.

145 Cooper 2018; Fitzenreiter 2012; Von Pilgrim 2015

146 As discussed in: Dirminti 2014, 242–243; O'Connor 1997; Redford 1997, 68–69; Säve-Söderbergh 1956; Smith and Smith 1976, 50–74.

147 As discussed in Fitzenreiter 2012; O'Connor 1984; Raue 2018, 208–262.

eign communities. These include the objects imported, their imitations, or the objects inspired by the ones found in the Levant (i.e. the metal weapons and the Tell el-Yahudiyah ware), Nubia, (i.e. the beads of shell and bone), and Cyprus (i.e. the Cypriot pottery), as well as imported materials, such as lapis lazuli, obsidian, and silver.

During the Early Second Intermediate Period, the major sites were Tell el-Dab'a in the Eastern Delta, Harageh in the Memphis-Fayyum area, Qau el-Kebir in Middle Egypt, and Ain Asil in Dakhla Oasis in the Western Desert. Tell el-Dab'a achieved independence and, consequently, became able to produce and distribute the main types of objects surveyed in the present research, while still acquiring material resources, even though in a smaller amount and less frequently than in the previous period. The material culture is more differentiated than during the Late Middle Kingdom, but the territories were not isolated. Contacts, even though weak, still continued between Lower Egypt, the Memphis-Fayyum area, and Dakhla Oasis, as well as with southern Upper Egypt, involving in a small part the desert routes in the Western Desert. The role detected for Qau el-Kebir and its geographical position suggests that communities of the Pan-grave culture became more important, probably because they played a role in the access to material resources and in their circulation. In southern Upper Egypt, Abydos and Edfu were main sites and still maintained connections with Lower Egypt. The fact that Tod and Hu were engaged in relations involving people of the Pan-grave culture and, through them, Tell el-Dab'a suggests a role played by these people in the communications during the Early Second Intermediate Period. There is the possibility that Tell el-Dab'a, Ain Asil, Harageh, Qau el-Kebir, and Abydos belonged to different territories, but this can be said with certainty only for the first two.

During the Late Second Intermediate Period, Tell el-Dab'a was an important site, under Hyksos rule, controlling the other sites in the Eastern Delta, which also oversaw the flow of goods between Egypt and the Levant. The use of the desert routes is shown by the contacts detected between the sites in the Memphis-Fayyum area, especially Sedment, the Eastern Delta, and Dakhla Oasis, though the contacts with Dakhla Oasis do not appear to have been strong. All in all, Dakhla Oasis, which had weak contacts also with the sites in Middle Egypt probably through the desert route of the Darb el-Tawil (see Map 1), could be part of a separate territory with Kharga Oasis, while Bahariya Oasis, in the northern part of the Western Desert, was under Hyksos influence. In Middle Egypt, Qau el-Kebir and Mostagedda were main sites and had strong contacts with both Lower and southern Upper Egypt, which shows that communities of the Pan-Grave culture were still involved, directly or indirectly, in the communications between different areas of Egypt. Matmar and Rifeh were also part of the routes between Lower and southern Upper Egypt,

even though they were respectively under control of the Hyksos and of other communities of Pan-grave culture such as the ones of Qau el-Kebir and Mostagedda. In southern Upper Egypt, the Theban area was a main site, because it was the centre of the kingdom of the Seventeenth Dynasty and possibly of the Sixteenth Dynasty.

Communications between the Theban area and the other sites in Egypt went mostly via the river, though the rulers of at least the Seventeenth Dynasty invested in the routes leading to the northern part of the Qena bend and to Kharga Oasis. These rulers were also able to organize activities in the central Eastern Desert, probably also involving the Pan-grave community present at Mostagedda. At the same time, Hu and Abydos had contacts with both the Eastern Delta and Middle Egypt. Hu had close contacts, or was even under the influence of, sites with communities of Pan-grave culture such as Qau el-Kebir and Mostagedda. It also had contacts with the Theban rulers and with the oases of the southern part of the Western Desert, through the Girga road, the Darb el-Ghubbari and the Darb Ain Amur (see Map 1). The strong contacts detected between Abydos and the Hyksos could indicate that it was under the influence of, or even controlled by, the Hyksos at the beginning of the Late Second Intermediate Period. Lastly, Elephantine could also be a separate territory, in close contacts with Nubia but not with other regions in Egypt, which reached Nubia through the Western Desert.

All in all, the analysis has detected four areas: the sites in the Eastern Delta, the oases in the southern part of the Western Desert (Dakhla and Kharga), Upper Egypt, and the area of Elephantine. The sites in the Memphis-Fayyum area and Bahariya Oasis were under the influence of the Hyksos and gave them access to the desert routes. Middle Egypt was a border area in contact with both Lower Egypt and the rest of Upper Egypt.

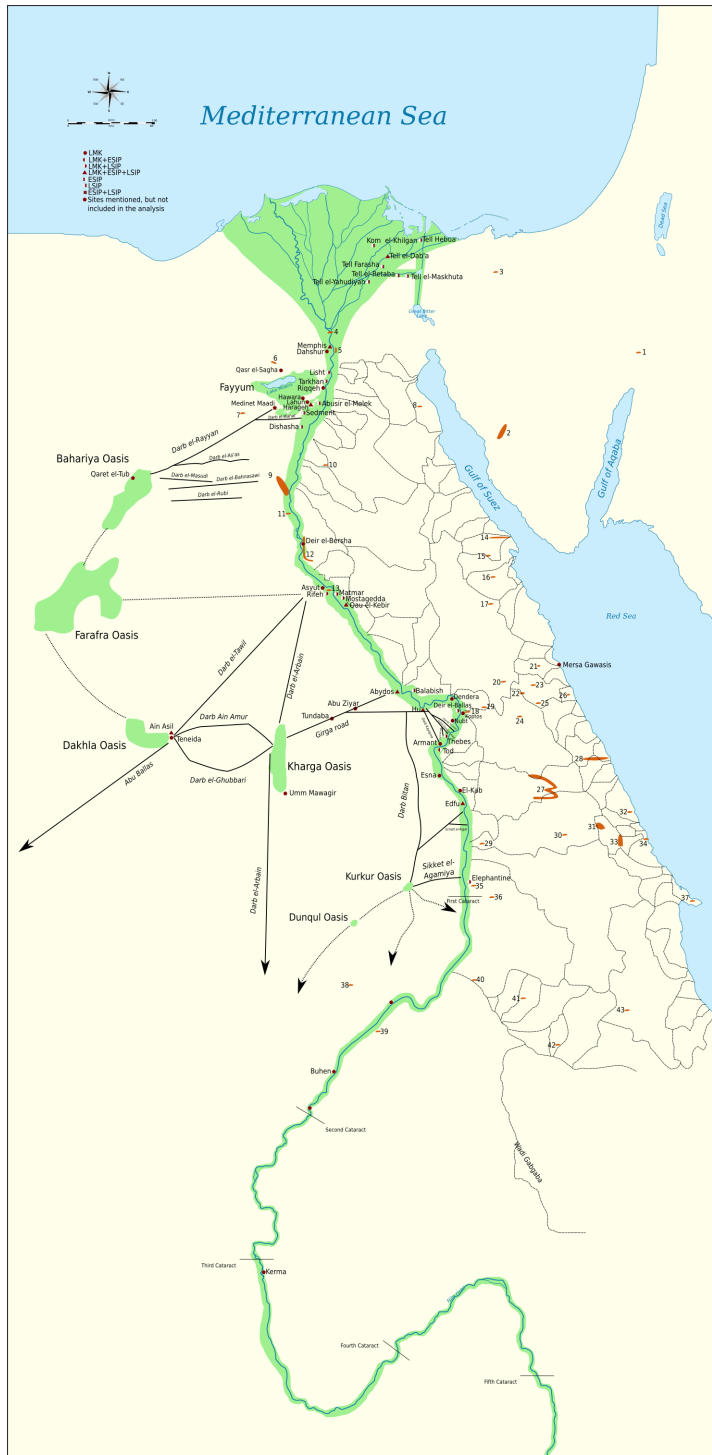
In general, the results of the present study have confirmed what is known about the period examined, giving at the same time more nuance and shedding more light on particular aspects. These concern firstly the role of the groups of Pan-grave culture. The present study has demonstrated how these communities played a central part in the communications between the different areas and in the access to the sources of stones and metals, located mostly in the desert. The second aspect is the changing role of Tell el-Dab'a and of the eastern Nile Delta. During the Late Middle Kingdom, when Egypt was united, the area was the place where goods coming from outside, through the Mediterranean Sea and through the Sinai Peninsula, entered Egypt and found their way to the capital. With the political fragmentation of the Second Intermediate Period, the eastern Nile Delta, and especially Tell el-Dab'a, was able to produce consumption goods and distribute them to other areas of Egypt. Thirdly, the present work has shown the particular role of Abydos during the

Second Intermediate Period. This site played a role in the networks during the Early Second Intermediate Period, and during the Late Second Intermediate Period it had stronger contacts with Lower Egypt, which could suggest that it was under Hyksos influence. Despite this, Abydos has material culture in common with both Lower and Upper Egypt. Therefore, the present study has also demonstrated how a mixed material culture is present there, probably because it was along the border of the Theban reign. Lastly, Elephantine has also been revealed to be an interesting site, whose material culture has little in common with the rest of Egypt, either because it was on the border with Nubia, either because it belonged to a separate territory.

FURTHER POSSIBILITIES

The present research has shown that network analysis can be of great help when it comes to examining material culture, especially when it comes to understanding historical periods about which much is still unknown or subject to scholarly debate. Network analysis is especially useful when it comes to studying relationships, between either places or groups of people. It is also useful in getting to grips with regionalization. Drawbacks of this methodology, which concern mostly the range of available data and the interpretations, can be overcome by considering carefully which data to analyse, and by contextualizing the results of the analysis in the light of what is known of the period in question.

Further possibilities are offered by this methodology, even for the period examined in the present work. Analysing other groups of objects, such as pottery, can give further confirmation or lead to new insights. Moreover, new excavations and new publications, as well as the revision of older archaeological work, will offer in the future the possibility of including more data in the analysis. The field of Egyptology can benefit from applying network analysis to the study of ancient Egyptian material culture, and it is my wish that the potential of this methodology is used to also study other periods of ancient Egyptian history through material culture.



MAP I

MAP OF EGYPT

This map shows:

- The sites analysed or mentioned in the present work. The icons describe the period when each site was in use, as explained in the legend in the map.
- The routes in the Western Desert and in the Theban desert. The dotted routes are only not discussed in the present work.
- The wadi basins of the Eastern Desert.
- The main mineral and metal resources.

The numbers refer to mines and quarries:

1. Copper – Timna
2. Copper and turquoise – Serabit el-Khadim
Turquoise – Wadi Umm Themaim
3. Turquoise – Gebel Maghara
4. Sedimentary quartzite – Gebel Ahmar
5. Calcite-alabaster – Wadi el-Garawi and Wadi Hof (approx. coordinates)
6. Basalt – Gebel el-Qatrani and Widan el-Faras
7. Alabaster – Umm el-Sawan
8. Copper and calcite-alabaster – Wadi Araba
9. Basalt – Samalut and Tilal Sawda
10. Calcite-alabaster – Wadi Umm Argub
11. Calcite-alabaster – El-Qawatir (approx. coordinates)
12. Anhydrite – Wadi Ibada and Wadi el-Imrani
Calcite-alabaster – Hatnub, Wadi el-Barshaw, and Wadi el-Zebeida
13. Calcite-alabaster – Wadi Assiut (approx. coordinates)
14. Haematite and marble – Wadi Dib (approx. coordinates)
Galena – Gebel el-Zeit

15. Amethyst – Wadi Abu Had
16. Haematite – Gebel Abu Marwat
17. Diorite– Umm Shegilat
18. Gold – Koptos
19. Serpentine – Umm Esh
20. Agate, carnelian, and haematite – Wadi Abu Gerida
21. Amethyst – Abu Diyeiba and Wadi Waseef
22. Jasper – Wadi Hameda
23. Steatite – Wadi Saqiyah
24. Siltstone – Wadi Hammamat
25. Garnet – Gebel Mitiq
26. Haematite and carnelian – Wadi Saga
27. Feldspar – Gebel Migif
 Feldspar and steatite – Wadi Abu Muawad
 Marble – Gebel Rokham
 Steatite – Gebel Rod el-Barram, Gebel Salatit, Wadi Abu Qureya, Wadi
 el-Humra, and Wadi Umm Salim
 Steatite and serpentine – Wadi Barramiya
28. Copper – Wadi Sitra
 Steatite – Wadi Mubarak
29. Serpentine – Wadi Shait
30. Copper – Hammash
31. Feldspar – Gebel Hafafit and Wadi Fayrouz
32. Alabaster and anhydrite – Wadi el-Anba'ut
33. Garnet – Wadi Sikait
 Serpentine – Gebel Sikait
 Steatite – Wadi Sikait
34. Feldspar and garnet – Wadi Gemal
35. Sedimentary quartzite – Gebel Gulab
36. Amethyst – Wadi el-Hudi
37. Alabaster and anhydrite – Ras Banas
38. Carnelian – Stela Ridge
39. Carnelian – Gebel el-Asr (coordinates approximated)
40. Gold – Wadi Allaqi
41. Marble – Wadi Haimur
42. Serpentine – Muqsim (coordinates approximated)
43. Steatite – Wadi Kamoyid

	<i>Latitude</i>	<i>Longitude</i>	<i>LMK</i>	<i>ESIP</i>	<i>LSIP</i>
Tell Hebua	30.931412	32.379642			X
Kom el-Khilgan	30.914768	31.630953			X
Tell el-Dab'a	30.783333	31.833332	X	X	X
Tell Farasha	30.6675	31.738611			X
Tell el-Maskhuta	30.551945	32.09861			X
Tell el-Retaba	30.5475	31.963612			X
Tell el-Yahudiyah	30.4925	31.554443			X
Memphis	29.844723	31.250834	X	X	X
Dahshur	29.816668	31.216667	X		
Qasr el-Sagha	29.595	30.677778	X		
Lisht	29.570278	31.231112	X		X
Tarkhan	29.5	31.225			X
Riqqeh	29.433332	31.216667	X		
Hawara	29.274166	30.89889	X		
Abusir el-Meleq	29.25026	31.08654			X
Lahun	29.233334	30.966667	X		
Harageh	29.216667	31.033333	X	X	X
Sedment	29.133333	30.9			X
Dishasha	29	30.833334			X
Rifeh	27.1	31.333332	X		X
Matmar	27.1	31.175	X		X
Mostagedda	27.083332	31.383333	X		X
Qau el-Kebir	26.9925	31.4156	X	X	X
Balabish	26.211971	32.135693			X
Abydos	26.18486	31.918879	X	X	X
Denderah	26.142195	32.669724	X		
Ballas / Deir el-Ballas	26.016787	32.766724	X		X
Hu	26.016666	32.283333	X	X	X
Nubt	25.9	32.716667	X		
Theban area	25.725	32.620834	X		X
Armant	25.616667	32.533333	X		

	<i>Latitude</i>	<i>Longitude</i>	<i>LMK</i>	<i>ESIP</i>	<i>LSIP</i>
Tod	25.583069	32.53354	X	X	
Ain Asil	25.516666	29.166668	X	X	X
Esna	25.2975	32.55417	X		
El-Kab	25.118889	32.79778	X		
Edfu	24.978167	32.8735	X	X	X
Elephantine	24.090279	32.88972	X		X

APPENDIX I

ANALYSIS OF CONTEXTS

Tables 7–24 in this appendix summarize, for each category of objects in each period, the number and types of context from the sites examined, to give an impression of how they contribute to the analysis. Nevertheless, in the analysis also a group of sites is included, for which the type of contexts is clear, but not their amount. In the following tables, these sites are mentioned under ‘Additional sites’. Given that the research is conducted binarizing the matrices, namely considering only the presence or absence of types on the sites, the exact number of contexts is not fundamental, thus the mentioned sites could be taken into consideration.

The contexts include the burials and contexts from settlements. Where applicable, the burials have been divided into common and royal, namely burials not belonging to members of the royal family and burials belonging to them. Furthermore, the contexts from settlements have also been divided, where applicable, in domestic and religious, namely contexts not coming from temple areas and contexts coming from temple areas. To be included in this analysis, the contexts must satisfy three conditions:

1. They must clearly date to one of the chronological phases examined in the present work;
2. They must contain the category of objects analysed;
3. The publication in which they are discussed needs to include the data needed to fill in the columns of the database. For the contexts, at least the type of context needs to be known.

This appendix has been divided into three sections, one for each of the three chronological phases analysed in the present work. In each section, the tables concern the contexts with following category of objects, in the order: beads, stone vessels, scarab and seal impressions, Tell el-Yahudiyah ware, Cypriot pottery, and weapons.

CONTEXTS OF THE LATE MIDDLE KINGDOM

<i>Sites</i>	<i>Contexts</i>	<i>Burial contexts</i>		<i>Settlement contexts</i>		<i>Types of beads</i>
		<i>Common</i>	<i>Royal</i>	<i>Domestic</i>	<i>Religious</i>	
Tell el-Dab'a	8=2.48%	8	0	0	0	36
Dahshur	10=3.42%	4	7	0	0	65
Lisht	4=1.24%	4	0	0	0	17
Hawara	2=0.62%	1	1	0	0	16
Lahun	23=7.14%	16	6	0	1	40
Harageh	136=42.24%	136	0	0	0	103
Riqqeh	17=5.28%	17	0	0	0	15
Matmar	11=3.42%	11	0	0	0	28
Mostagedda	8=2.48%	8	0	0	0	16
Qau el-Kebir	23=7.14%	23	0	0	0	26
Abydos	29=9.01%	29	0	0	0	36
Hu	5=1.55%	5	0	0	0	11
Denderah	1=0.31%	1	0	0	0	5
Theban area	1=0.31%	1	0	0	0	13
Armant	1=0.31%	1	0	0	0	24
Tod	2=0.62%	0	0	0	2	4
Esna	24=7.45%	24	0	0	0	47
Edfu	12=3.73%	12	0	0	0	24
Elephantine	2=0.62%	0	0	2	0	11
Ain Asil	2=0.62%	0	0	2	0	3
<i>Total</i>	322	301=93.48%	14=4.35%	4=1.24%	3=0.93%	
<i>Additional sites</i>						
<i>Site</i>	<i>Type of contexts</i>		<i>Types of beads</i>			
Lahun	Settlement		4			
Rifeh	Common burials		4			
Ballas	Common burials		8			
El-Kab	Common burials		19			

Table 7: Contexts of the Late Middle Kingdom with beads.

<i>Site</i>	<i>Contexts</i>	<i>Burial contexts</i>		<i>Settlement contexts</i>		<i>Types of stone vessels</i>
		<i>Common</i>	<i>Royal</i>	<i>Domestic</i>	<i>Religious</i>	
Tell el-Dab'a	4=1.65%	4	0	0	0	4
Dahshur	11=4.62%	2	9	0	0	13
Lisht	2=0.84%	1	1	0	0	3
Hawara	2=0.84%	0	2	0	0	2
Lahun	6=2.55%	2	1	3	0	7
Harageh	28=11.76%	28	0	0	0	28
Qasr el-Sagha	5=1.28%	0	0	4	1	5
Riqqeh	14=5.88%	14	0	0	0	10
Rifeh	30=12.61%	30	0	0	0	17
Matmar	5=2.10%	5	0	0	0	4
Mostagedda	4=1.68%	4	0	0	0	4
Qau el-Kebir	13=5.46%	13	0	0	0	12
Abydos	20=8.40%	20	0	0	0	28
Hu	62=27.31%	65	0	0	0	29
Denderah	3=1.26%	3	0	0	0	5
Armant	1=0.42%	1	0	0	0	1
Esna	10=4.20%	10	0	0	0	16
Edfu	14=5.88%	14	0	0	0	25
Elephantine	1=0.42%	0	0	1	0	1
<i>Total contexts</i>	238	216=90.76%	11=4.68%	6=2.55%	1=0.43%	
<i>Additional sites</i>						
<i>Site</i>	<i>Type of contexts</i>		<i>Types of stone vessels</i>			
Ballas	Settlement and burial		4			

Table 8: Contexts of the Late Middle Kingdom with stone vessels.

<i>Sites</i>	<i>Contexts</i>	<i>Burial contexts</i>		<i>Settlement contexts</i>	<i>Types of scarab and seal impressions</i>
		<i>Common</i>	<i>Royal</i>		
Tell el-Dab'a	16=10.39%	16	0	0	13
Dahshur	5=3.40%	1	4	0	4
Lahun	3=2.04%	2	1	0	2
Harageh	30=20.41%	30	0	0	18
Riqqeh	7=4.76%	7	0	0	6
Matmar	6=3.90%	6	0	0	5
Mostagedda	8=5.19%	8	0	0	5
Qau el-Kebir	16=10.88%	16	0	0	9
Abydos	18=11.69%	15	3	0	16
Hu	7=4.76%	7	0	0	1
Denderah	2=1.36%	2	0	0	5
Theban area	4=2.72%	3	0	1	4
Esna	29=18.83%	29	0	0	25
Edfu	3=1.95%	3	0	0	1
<i>Total contexts</i>	154	146=94.81%	8=5.19%	1=0.68%	
<i>Additional sites</i>					
<i>Site</i>	<i>Type of contexts</i>		<i>Types of scarab and seal impressions</i>		
Lahun	Settlement		32		
Lisht	Common burials		23		
Ballas	Common burials		1		
Nubt	Settlement		17		
Elephantine	Deposits in settlement		26		

Table 9: Contexts of the Late Middle Kingdom with scarab and seal designs.

<i>Sites</i>	<i>Total contexts</i>	<i>Burial contexts</i>	<i>Settlement contexts</i>	<i>Types of Tell el-Yahudiyah ware</i>
Tell el-Dab'a	21=67.74%	9	12	11
Memphis	1=3.23%	0	1	1
Lisht	4=12.90%	4	0	5
Harageh	2=6.45%	1	1	2
Qasr el-Sagha	2=6.45%	0	2	2
Theban area	1=3.23%	1	0	1
<i>Total contexts</i>	31	15=48.14%	16=51.61%	
<i>Additional sites</i>				
<i>Site</i>	<i>Type of contexts</i>	<i>Types of Tell el-Yahudiyah ware</i>		
Lahun	Settlement	3		

Table 10: Contexts of the Late Middle Kingdom with Tell el-Yahudiyah ware.

<i>Sites</i>	<i>Total contexts</i>	<i>Burial contexts</i>	<i>Settlement contexts</i>	<i>Types of Cypriot pottery</i>
Tell el-Dab'a	9=81.82%	1	8	4
Dahshur	1=10%	1	0	1
Lahun	1=10%	0	1	1
<i>Total contexts</i>	11	2=18.18%	9=81.82%	

Table 11: Contexts of the Late Middle Kingdom with Cypriot pottery.

<i>Sites</i>	<i>Contexts</i>	<i>Burial contexts</i>		<i>Settlement contexts</i>		<i>Types of weapons</i>
		<i>Common</i>	<i>Royal</i>	<i>Domestic</i>	<i>Religious</i>	
Tell el-Dab'a	14=46.67%	13	0	1	0	11
Dahshur	2=6.67%	0	2	0	0	1
Lisht	1=3.33%	1	0	0	0	1
Harageh	1=3.33%	1	0	0	0	1
Qau el-Ke-bir	1=3.33%	1	0	0	0	1
Abydos	1=3.33%	1	0	0	0	1
Hu	8=26.67%	8	0	0	0	7
Esna	1=3.33%	1	0	0	0	1
Edfu	1=3.33%	1	0	0	0	1
<i>Total</i>	30	27=90%	2=6.67%	1=3.33%	0=0%	
<i>Additional sites</i>						
<i>Site</i>	<i>Type of contexts</i>		<i>Types of weapons</i>			
Lahun	Settlement		7			

Table 12: Contexts of the Late Middle Kingdom with weapons.

CONTEXTS OF THE EARLY SECOND INTERMEDIATE PERIOD

<i>Sites</i>	<i>Total contexts</i>	<i>Burial contexts</i>	<i>Settlement contexts</i>	<i>Types of beads</i>
Tell el-Dab'a	9=12.33%	9	0	34
Harageh	10=13.70%	10	0	30
Qau el-Kebir	42=57.53%	42	0	26
Abydos	3=4.11%	3	0	5
Tod	3=4.11%	3	0	4
Edfu	1=1.37%	1	0	4
Ain Asil	5=6.85%	0	5	15
<i>Total contexts</i>	73	68=93.15%	5=6.85%	

Table 13: Contexts of the Early Second Intermediate Period with beads.

<i>Sites</i>	<i>Total contexts</i>	<i>Burial contexts</i>	<i>Settlement contexts</i>	<i>Types of stone vessels</i>
Tell el-Dab'a	7=38.89%	6	1	10
Qau el-Kebir	1=5.56%	1	0	1
Abydos	2=11.11%	2	0	7
Tod	2=11.11%	2	0	2
Edfu	2=11.11%	2	0	15
Ain Asil	4=22.22%	0	4	4
<i>Total contexts</i>	18	13=72.22%	5=27.78%	

Table 14: Contexts of the Early Second Intermediate Period with stone vessels.

<i>Sites</i>	<i>Total contexts</i>	<i>Burial contexts</i>	<i>Settlement contexts</i>	<i>Types of scarab and seal impressions</i>
Tell el-Dab'a	18=66.67%	18	0	11
Qau el-Kebir	1=3.70%	1	0	1
Abydos	6=22.22%	6	0	7
Ain Asil	2=7.41%	0	2	2
<i>Total contexts</i>	27	25=92.59%	2=7.41%	

Table 15: Contexts of the Early Second Intermediate Period with scarab and seal designs.

<i>Sites</i>	<i>Total contexts</i>	<i>Burial contexts</i>	<i>Settlement contexts</i>	<i>Types Tell el-Yahudiyah ware</i>
Tell el-Dab'a	35=94.59%	29	6	27
Memphis	1=2.70%	0	1	1
Abydos	1=2.70%	1	0	1
<i>Total contexts</i>	37	30=81.08%	7=18.92%	

Table 16: Contexts of the Early Second Intermediate Period with Tell el-Yahudiyah ware.

<i>Sites</i>	<i>Total contexts</i>	<i>Burial contexts</i>	<i>Settlement contexts</i>	<i>Types of Cypriot pottery</i>
Tell el-Dab'a	18	0	18	3
<i>Total contexts</i>	18	0	18	

Table 17: Contexts of the Early Second Intermediate Period with Cypriot pottery.

<i>Sites</i>	<i>Total contexts</i>	<i>Burial contexts</i>	<i>Settlement contexts</i>	<i>Types of weapons</i>
Tell el-Dab'a	9=52.94%	8	1	8
Qau el-Kebir	2=11.76%	2	0	1
Abydos	4=23.53%	4	0	3
Hu	2=11.76%	2	0	2
<i>Total contexts</i>	17	16=94.12%	1=5.88%	

Table 18: Contexts of the Early Second Intermediate Period with weapons.

CONTEXTS OF THE LATE SECOND INTERMEDIATE PERIOD

<i>Site</i>	<i>Total contexts</i>	<i>Burial contexts</i>	<i>Settlement contexts</i>	<i>Types of beads</i>
Tell el-Dab'a	45=17.58%	31	14	61
Tell el-Retaba	1=0.39%	1	0	1
Tell el-Maskhuta	7=2.73%	6	1	22
Sedment	34=13.28%	34	0	31
Tarkhan	1=0.39%	1	0	1
Matmar	9=3.52%	9	0	19
Mostagedda	95=37.11%	95	0	56
Qau el-Kebir	20=7.81%	20	0	38
Balabish	32=12.50%	32	0	14
Abydos	7=2.73%	7	0	9
Deir el-Ballas	1=0.39%	0	1	2
Elephantine	1=0.39%	0	1	1
Tell Hebua	3=1.17%	1	2	3
<i>Total contexts</i>	256	237=92.58%	19=7.42%	
<i>Additional sites</i>				
<i>Site</i>	<i>Type of contexts</i>		<i>Types of beads</i>	
Lisht	Burials		15	
Hu	Burials		5	
Theban area	Burials		21	

Table 19: Contexts of the Late Second Intermediate Period with beads.

<i>Site</i>	<i>Total contexts</i>	<i>Burial contexts</i>	<i>Settlement contexts</i>	<i>Types of stone vessels</i>
Tell el-Dab'a	9=12.16%	8	1	8
Sedment	7=9.46%	7	0	13
Tarkhan	1=1.35%	1	0	1
Matmar	4=5.41%	4	0	3
Mostagedda	18=24.32%	18	0	7
Qau el-Kebir	16=21.62%	16	0	13
Balabish	6=8.11%	6	0	4
Abydos	5=6.76%	5	0	8
Hu	2=2.70%	2	0	1
Theban area	3=4.05%	3	0	8
Tell Hebua	5=4.05%	0	3	15
<i>Total contexts</i>	74	70=94.59%	4=5.41%	

Table 20: Contexts of the Late Second Intermediate Period with stone vessels.

<i>Site</i>	<i>Total contexts</i>	<i>Burial contexts</i>	<i>Settlement contexts</i>	<i>Types of scarab and seal impressions</i>
Tell el-Dab'a	52=33.77%	34	18	35
Tell el-Maskhuta	11=7.14%	11	0	17
Tell el-Retaba	1=0.65%	1	0	2
Sedment	18=11.69%	18	0	19
Matmar	7=4.55%	7	0	9
Mostagedda	33=21.43%	33	0	19
Qau el-Kebir	11=7.14%	11	0	19
Abydos	2=1.30%	2	0	1
Hu	7=4.55%	7	0	9
Theban area	6=3.90%	6	0	4
Deir el-Ballas	1=0.65%	0	1	2
Tell Hebua	2=1.30%	1	1	2
Ain Asil	3=1.95%	0	3	4
<i>Total contexts</i>	154	131=85.06%	23=14.94%	
<i>Additional sites</i>				
<i>Site</i>	<i>Type of contexts</i>		<i>Types of scarab and seal impressions</i>	
Tell el-Maskhuta	Settlement		4	
Tell el-Yahudiyah	Settlement; Burials		42	
Rifeh	Burials		17	

Table 21: Contexts of the Late Second Intermediate Period with scarab and seal designs.

<i>Site</i>	<i>Total contexts</i>	<i>Burial contexts</i>	<i>Settlement contexts</i>	<i>Types of Tell el-Yahudiyah ware</i>
Tell el-Dab'a	135=93.10%	72	63	58
Harageh	2=1.38%	2	0	2
Sedment	1=0.69%	1	0	1
Mostagedda	1=0.69%	1	0	1
Abydos	3=2.07%	3	0	3
Hu	2=1.38%	2	0	2
Tell Hebua	1=0.69%	0	1	1
<i>Total contexts</i>	<i>145</i>	<i>81=55.86%</i>	<i>64=44.14%</i>	
<i>Additional sites</i>				
<i>Site</i>	<i>Type of contexts</i>		<i>Types of Tell el-Yahudiyah ware</i>	
Tell el-Yahudiyah	Settlement; Burials		19	
Rifeh	Burials		3	
Edfu	Burials		1	

Table 22: Contexts of the Late Second Intermediate Period with Tell el-Yahudiyah ware.

<i>Site</i>	<i>Total contexts</i>	<i>Burial contexts</i>	<i>Settlement contexts</i>	<i>Types of Cypriot pottery</i>
Kom el-Khilgan	1=1.37%	0	1	1
Tell el-Dab'a	59=80.82%	6	53	16
Tarkhan	2=2.74%	2	0	2
Abusir el-Meleq	1=1.37%	1	0	1
Sedment	3=4.11%	3	0	3
Dishasha	1=1.37%	1	0	1
Rifeh	1=1.37%	1	0	1
Abydos	2=2.74%	2	0	3
Tell Hebua	2=2.74%	0	2	2
Ain Asil	1=1.37%	0	1	1
<i>Total contexts</i>	73	16=21.92%	57=78.08%	
<i>Additional sites</i>				
<i>Site</i>	<i>Type of contexts</i>	<i>Types of Cypriot pottery</i>		
Tell el-Maskhuta	Settlement	4		
Memphis	Settlement	2		

Table 23: Contexts of the Late Second Intermediate Period with Cypriot pottery.

<i>Site</i>	<i>Total contexts</i>	<i>Burial contexts</i>	<i>Settlement contexts</i>	<i>Types of weapons</i>
Tell el-Dab'a	21=45.65%	17	4	9
Tell el-Maskhuta	4=8.70%	4	0	5
Tell el-Yahudiyah	3=6.52%	3	0	4
Tell Farasha	2=4.35%	2	0	4
Mostagedda	9=19.57%	9	0	5
Qau el-Kebir	2=4.35%	2	0	2
Balabish	3=6.52%	3	0	2
Theban area	2=4.35%	2	0	2
<i>Total contexts</i>	46	42=91.30%	4=8.70%	

Table 24: Contexts of the Late Second Intermediate Period with weapons.

APPENDIX II

THE FIRST ONE-MODE GRAPH

Tables 25–76 in this appendix show how the sites rank concerning the centrality measures in the first one-mode graph, for all the phases and objects examined in the present work. In detail, this appendix is divided into four sections, each for every one of the centrality measures analysed. Each section is further divided into three subsections, each for every chronological phase studied in the present work. Thus, in each subsection are reported the tables, for all the categories of objects, concerning a particular measure in a particular chronological phase. For example, in the first subsection are the tables concerning the degree measure for the sites of the Late Middle Kingdom.

In each table, it is reported how the sites rank concerning that specific measure analysed, starting from the one with the highest score and then decreasing to the one with the lowest score: each line corresponds to a rank. The ranks and its range are respectively reported in the first and in the second column, while the scale is written at the head of the second column. In the third column, the sites have been grouped in the ranks whose range include their scores. The sites are listed from the one with the highest to the one with the lowest score of that rank.

THE DEGREE CENTRALITY

The Late Middle Kingdom

<i>Rank</i>	<i>Degree centrality (scale: 50.2)</i>	<i>Sites</i>
1-VH	280-229.8	Harageh
2-H	229.8-179.6	Lahun, Abydos, Dahshur
3-M	179.6-129.4	Esna, Qau el-Kebir, Matmar, Edfu
4-L	129.4-79.2	Armant, El-Kab, Tell el-Dab'a, Theban area, Lisht, Mostagedda, Riqqeh, Elephantine, Hawara
5-VL	79.2-29	Hu, Denderah, Rifeh, Ballas, Tod, Ain Anil

Table 25: Degree centrality scores of the first one-mode graph of the beads during the LMK.

<i>Rank</i>	<i>Degree centrality (scale: 15.6)</i>	<i>Sites</i>
1-VH	78-62.4	Hu, Abydos
2-H	62.4-46.8	Edfu, Harageh, Rifeh
3-M	46.8-31.2	Riqqeh, Esna
4-L	31.2-15.6	Dahshur, Lahun, Qau el-Kebir, Qasr el-Sagha, Ballas, Hawara
5-VL	15.6-0	Tell el-Dab'a, Denderah, Matmar, Lisht, Mostagedda, Armant, Elephantine

Table 26: Degree centrality scores of the first one-mode graph of the stone vessels during the LMK.

<i>Rank</i>	<i>Degree centrality (scale: 32.6)</i>	<i>Sites</i>
1-VH	168-135.2	Lahun, Elephantine
2-H	135.2-102.4	Harageh, Lisht, Esna, Nubt
3-M	102.4-69.6	Abydos, Tell el-Dab'a, Qau el-Kebir
4-L	69.6-36.8	Riqqeh, Denderah, Theban area, Matmar
5-VL	36.8-4	Mostagedda, Dahshur, Ballas, Edfu, Hu

Table 27: Degree centrality scores of the first one-mode graph of the scarab and seal designs during the LMK.

<i>Rank</i>	<i>Degree centrality (scale: 1)</i>	<i>Sites</i>
1-VH	5-4	Tell el-Dab'a, Lahun, Lisht, Qasr el-Sagha
2-H	4-3	-
3-M	3-2	Harageh
4-L	2-1	Memphis
5-VL	1-0	Theban area

Table 28: Degree centrality scores of the first one-mode graph of the Tell el-Yahudiyah ware during the LMK.

<i>Rank</i>	<i>Degree centrality (scale: 1)</i>	<i>Sites</i>
1-VH	5-4	Hu
2-H	4-3	Lahun, Tell el-Dab'a
3-M	3-2	Qau el-Kebir
4-L	2-1	Esna, Harageh, Lisht
5-VL	1-0	Abydos, Dahshur, Edfu

Table 29: Degree centrality scores of the first one-mode graph of the weapons during the LMK.

The Early Second Intermediate Period

<i>Rank</i>	<i>Degree centrality (scale: 7.4)</i>	<i>Sites</i>
1-VH	42-34.6	Tell el-Dab'a, Harageh, Qau el-Kebir
2-H	34.6-27.2	Ain Asil
3-M	27.2-19.8	-
4-L	19.8-12.4	Abydos
5-VL	12.4-5	Edfu, Tod

Table 30: Degree centrality scores of the first one-mode graph of the beads during the ESIP.

<i>Rank</i>	<i>Degree centrality (scale: 0.8)</i>	<i>Sites</i>
1-VH	4-3.2	Edfu
2-H	3.2-2.4	Tell el-Dab'a
3-M	2.4-1.6	Abydos
4-L	1.6-0.8	Tod
5-VL	0.8-0	Ain Asil, Qau el-Kebir

Table 31: Degree centrality scores of the first one-mode graph of the stone vessels during the ESIP.

The Late Second Intermediate Period

<i>Rank</i>	<i>Degree centrality (scale: 23.4)</i>	<i>Sites</i>
1-VH	117-93.6	Mostagedda, Tell el-Dab'a, Qau el-Kebir
2-H	93.6-70.2	Sedment, Theban area
3-M	70.2-46.8	Matmar, Balabish, Tell el-Maskhuta
4-L	46.8-23.4	Abydos, Hu, Lisht
5-VL	23.4-0	Deir el-Ballas, Tell Hebua, Tell el-Retaba, Elephantine, Tarkhan

Table 32: Degree centrality scores of the first one-mode graph of the beads during the LSIP.

<i>Rank</i>	<i>Degree centrality (scale: 2.4)</i>	<i>Sites</i>
1-VH	13-10.6	Qau el-Kebir, Sedment
2-H	10.6-8.2	Mostagedda, Tell Hebua
3-M	8.2-5.8	Abydos, Matmar
4-L	5.8-3.4	Theban area, Balabish, Hu
5-VL	3.4-1	Tell el-Dab'a, Tarkhan

Table 33: Degree centrality scores of the first one-mode graph of the stone vessels during the LSIP.

<i>Rank</i>	<i>Degree centrality (scale: 27.8)</i>	<i>Sites</i>
1-VH	145-117.2	Tell el-Yahudiyah, Tell el-Dab'a
2-H	117.2-89.4	Sedment
3-M	89.4-61.6	Mostagedda, Rifeh, Qau el-Kebir, Tell el-Maskhuta
4-L	61.6-33.8	Matmar, Hu
5-VL	33.8-6	Ain Asil, Theban area, Tell Hebua, Deir el-Ballas, Abydos, Tell el-Retaba

Table 34: Degree centrality scores of the first one-mode graph of the scarab and seal designs during the LSIP.

<i>Rank</i>	<i>Degree centrality (scale: 4.4)</i>	<i>Sites</i>
1-VH	23-18.6	Tell el-Dab'a, Tell el-Yahudiyah
2-H	18.6-14.2	-
3-M	14.2-9.8	-
4-L	9.8-5.4	Abydos, Harageh, Hu, Rifeh
5-VL	5.4-1	Edfu, Mostagedda, Tell Hebua, Sedment

Table 35: Degree centrality scores of the first one-mode graph of the Tell el-Yahudiyah ware during the LSIP.

<i>Rank</i>	<i>Degree centrality (scale: 2.6)</i>	<i>Sites</i>
1-VH	14-11.4	Tell el-Dab'a
2-H	11.4-8.8	Tell el-Maskhuta
3-M	8.8-6.2	Tell Hebua, Abydos, Sedment
4-L	6.2-3.6	Tarkhan, Abusir el-Meleq, Dishasha
5-VL	3.6-1	Ain Asil, Kom el-Khilgan, Memphis, Rifeh

Table 36: Degree centrality scores of the first one-mode graph of the Cypriot pottery during the LSIP.

<i>Rank</i>	<i>Degree centrality (scale: 1.4)</i>	<i>Sites</i>
1-VH	7-5.6	Tell el-Dab'a, Tell el-Maskhuta
2-H	5.6-4.2	–
3-M	4.2-2.8	Mostagedda, Tell el-Yahudiyah, Tell Farasha
4-L	2.8-1.4	Balabish, Qau el-Kebir
5-VL	1.4-0	Theban area

Table 37: Degree centrality scores of the first one-mode graph of the weapons during the LSIP.

THE BETWEENNESS CENTRALITY

The Late Middle Kingdom

<i>Rank</i>	<i>Betweenness centrality (scale: 12.76)</i>	<i>Sites</i>
1-VH	63.8-51.04	Ain Asil, Tod, Ballas
2-H	51.04-38.28	–
3-M	38.28-25.52	–
4-L	25.52-12.76	–
5-VL	12.76-0	Rifeh, Denderah, Lisht, Hawara, Elephantine, Lahun, Qau el-Kebir, Armant, Theban area, Riqqeh, Hu, Tell el-Dab'a, Harageh, Abydos, Dahshur, Esna, Matmar, Edfu, El-Kab, Mostagedda

Table 38: Betweenness centrality scores of the first one-mode graph of the beads during the LMK.

<i>Rank</i>	<i>Betweenness centrality (scale: 5)</i>	<i>Sites</i>
1-VH	30-24	Matmar
2-H	24-18	Denderah
3-M	18-12	Qau el-Kebir, Abydos, Dahshur
4-L	12-6	Lahun, Lisht
5-VL	6-0	Tell el-Dab'a, Rifeh, Ballas, Hawara, Qasr el-Sagha, Riqqeh, Harageh, Edfu, Esna, Hu, Mostagedda, Armant, Elephantine

Table 39: Betweenness centrality scores of the first one-mode graph of the stone vessels during the LMK.

<i>Rank</i>	<i>Betweenness centrality (scale: 10.29)</i>	<i>Sites</i>
1-VH	51.45-41.16	Ballas
2-H	41.16-30.87	—
3-M	30.87-20.58	Dahshur, Edfu
4-L	20.58-10.29	Matmar
5-VL	10.29-0	Hu, Qau el-Kebir, Riqqeh, Lahun, Denderah, Mostagedda, Esna, Elephantine, Harageh, Tell el-Dab'a, Abydos, Lisht, Nubt, Theban area

Table 40: Betweenness centrality scores of the first one-mode graph of the scarab and seal designs during the LMK.

<i>Rank</i>	<i>Betweenness centrality (scale: 0.8)</i>	<i>Sites</i>
1-VH	4-3.2	Tell el-Dab'a
2-H	3.2-2.4	—
3-M	2.4-1.6	Lahun, Lisht
4-L	1.6-0.8	—
5-VL	0.8-0	Harageh, Memphis, Qasr el-Sagha, Theban area

Table 41: Betweenness centrality scores of the first one-mode graph of the Tell el-Yahudiyah ware during the LMK.

<i>Rank</i>	<i>Betweenness centrality (scale: 2.2)</i>	<i>Sites</i>
1-VH	11-8.8	Hu, Tell el-Dab'a
2-H	8.8-6.6	—
3-M	6.6-4.4	—
4-L	4.4-2.2	Qau el-Kebir
5-VL	2.2-0	Abydos, Dahshur, Edfu, Esna, Harageh, Lahun, Lisht

Table 42: Betweenness centrality scores of the first one-mode graph of the weapons during the LMK.

The Early Second Intermediate Period

<i>Rank</i>	<i>Betweenness centrality (scale: 1.15)</i>	<i>Sites</i>
1-VH	5.75-4.6	Edfu
2-H	4.6-3.45	Tod
3-M	3.45-2.3	—
4-L	2.3-1.15	—
5-LV	1.15-0	Abydos, Tell el-Dab'a, Harageh, Qau el-Kebir, Ain Asil

Table 43: Betweenness centrality scores of the first one-mode graph of the beads during the ESIP.

<i>Rank</i>	<i>Betweenness centrality (scale: 0.4)</i>	<i>Sites</i>
1-VH	2-1.6	Edfu, Abydos
2-H	1.6-1.2	–
3-M	1.2-0.8	–
4-L	0.8-0.4	–
5-VL	0.4-0	Tell el-Dab'a, Tod, Ain Asil, Qau el-Kebir

Table 44: Betweenness centrality scores of the first one-mode graph of the stone vessels during the ESIP.

The Late Second Intermediate Period

<i>Rank</i>	<i>Betweenness centrality (scale: 6.56)</i>	<i>Sites</i>
1-VH	32.8-26.24	Tell Hebua
2-H	26.24-19.68	–
3-M	19.68-13.12	Tell el-Retaba
4-L	13.12-6.56	–
5-VL	6.56-0	Deir el-Ballas, Hu, Tell el-Maskhuta, Qau el-Kebir, Tell el-Dab'a, Mostagedda, Theban area, Abydos, Matmar, Sedment, Balabish, Lisht, Elephantine, Tarkhan

Table 45: Betweenness centrality scores of the first one-mode graph of the beads during the LSIP.

<i>Rank</i>	<i>Betweenness centrality (scale: 2.74)</i>	<i>Sites</i>
1-VH	13.7-10.96	Sedment,
2-H	10.96-8.22	Tell Hebua, Qau el-Kebir
3-M	8.22-5.48	Hu
4-L	5.48-2.74	–
5-VL	2.74-0	Theban area, Abydos, Mostagedda, Matmar, Balabish, Tell el-Dab'a, Tarkhan

Table 46: Betweenness centrality scores of the first one-mode graph of the stone vessels during the LSIP.

<i>Rank</i>	<i>Betweenness centrality (scale: 7.36)</i>	<i>Sites</i>
1-VH	36.8–29.44	Abydos
2-H	29.44–22.08	–
3-M	22.08–14.72	–
4-L	14.72–7.36	Tell el-Retaba, Tell el-Maskhuta
5-VL	7.36–0	Matmar, Hu, Tell Hebua, Sedment, Ain Asil, Deir el-Ballas, Rifeh, Tell el-Dab'a, Tell el-Yahudiyah, Theban area, Mostagedda, Qau el-Kebir

Table 47: Betweenness centrality scores of the first one-mode graph of the scarab and seal designs during the LSIP.

<i>Rank</i>	<i>Betweenness centrality (scale: 3.02)</i>	<i>Sites</i>
1-VH	15.1–12.08	Tell el-Dab'a
2-H	12.08–9.06	–
3-M	9.06–6.04	Tell el-Yahudiyah
4-L	6.04–3.02	Rifeh
5-VL	3.02–0	Abydos, Harageh, Edfu, Mostagedda, Tell Hebua, Hu, Sedment

Table 48: Betweenness centrality scores of the first one-mode graph of the Tell el-Yahudiyah ware during the LSIP.

<i>Rank</i>	<i>Betweenness centrality (scale: 3.25)</i>	<i>Sites</i>
1-VH	16.25–13	Tell el-Dab'a, Abydos
2-H	13–9.75	–
3-M	9.75–6.5	–
4-L	6.5–3.25	Tell Hebua, Tell el-Maskhuta
5-VL	3.25–0	Sedment, Abusir el-Meleq, Dishasha, Ain Asil, Kom el-Khilgan, Tarkhan, Memphis, Rifeh

Table 49: Betweenness centrality scores of the first one-mode graph of the Cypriot pottery during the LSIP.

<i>Rank</i>	<i>Betweenness centrality (scale: 1.7)</i>	<i>Sites</i>
1-VH	8.5–6.8	Mostagedda
2-H	6.8–5.1	–
3-M	5.1–3.4	Tell el-Maskhuta
4-L	3.4–1.7	–
5-VL	1.7–0	Tell el-Dab'a, Tell Farasha, Balabish, Qau el-Kebir, Tell el-Yahudiyah, Theban area

Table 50: Betweenness centrality scores of the first one-mode graph of the weapons during the LSIP.

THE EIGENVECTOR CENTRALITY

The Late Middle Kingdom

Rank	Eigenvector centrality (scale: 0.078)	Sites
1-VH	0.43–0.352	Harageh
2-H	0.352–0.274	Lahun, Dahshur, Abydos, Esna, Qau el-Kebir
3-M	0.274–0.196	Matmar, Edfu, Armant
4-L	0.196–0.118	Tell el-Dab'a, El-Kab, Lisht, Theban area, Mostagedda, Hawara, Riqqeh, Elephantine
5-VL	0.118–0.04	Hu, Denderah, Rifeh, Ballas, Tod, Ain Asil

Table 51: Eigenvector centrality scores of the first one-mode graph of the beads during the LMK.

Rank	Eigenvector centrality (scale: 0.088)	Sites
1-VH	0.44–0.352	Hu, Abydos
2-H	0.352–0.264	Rifeh, Edfu, Harageh
3-M	0.264–0.176	Riqqeh, Esna, Lahun, Dahshur
4-L	0.176–0.088	Qau el-Kebir, Qasr el-Sagha, Ballas, Hawara, Tell el-Dab'a
5-VL	0.088–0	Denderah, Matmar, Lisht, Mostagedda, Armant, Elephantine

Table 52: Eigenvector centrality scores of the first one-mode graph of the stone vessels during the LMK.

Rank	Eigenvector centrality (scale: 0.088)	Sites
1-VH	0.44–0.352	Lahun, Elephantine
2-H	0.352–0.264	Lisht, Esna, Harageh, Nubt, Abydos
3-M	0.264–0.176	Tell el-Dab'a, Qau el-Kebir
4-L	0.176–0.088	Riqqeh, Denderah, Theban area, Mostagedda, Matmar
5-VL	0.088–0	Dahshur, Ballas, Edfu, Hu

Table 53: Eigenvector centrality scores of the first one-mode graph of the scarab and seal designs during the LMK.

Rank	Eigenvector centrality (scale: 0.092)	Sites
1-VH	0.46–0.368	Tell el-Dab'a, Qasr el-Sagha, Lahun, Lisht
2-H	0.368–0.276	-
3-M	0.276–0.184	Harageh
4-L	0.184–0.092	Memphis
5-VL	0.092–0	Theban area

Table 54: Eigenvector centrality scores of the first one-mode graph of the Tell el-Yahudiyah ware during the LMK.

Rank	Eigenvector centrality (scale: 0.09)	Sites
1-VH	0.45-0.36	Hu, Lahun
2-H	0.36-0.27	Qau el-Kebir
3-M	0.27-0.18	Tell el-Dab'a
4-L	0.18-0.09	Harageh
5-VL	0.09-0	Esna, Lisht, Abydos, Dahshur, Edfu

Table 55: Eigenvector centrality scores of the first one-mode graph of the weapons during the LMK.

The Early Second Intermediate Period

Rank	Eigenvector centrality (scale: 0.094)	Sites
1-VH	0.53-0.436	Tell el Dab'a, Harageh, Qau el-Kebir
2-H	0.436-0.342	Ain Asil
3-M	0.342-0.248	-
4-L	0.248-0.154	Abydos
5-VL	0.154-0.06	Edfu, Tod

Table 56: Eigenvector centrality scores of the first one-mode graph of the beads during the ESIP.

Rank	Eigenvector centrality (scale: 0.094)	Sites
1-VH	0.47-0.376	Edfu, Tell el-Dab'a
2-H	0.376-0.282	-
3-M	0.282-0.188	-
4-L	0.188-0.094	Abydos, Tod
5-VL	0.094-0	Ain Asil, Qau el-Kebir

Table 57: Eigenvector centrality scores of the first one-mode graph of the stone vessels during the ESIP.

The Late Second Intermediate Period

Rank	Eigenvector centrality (scale: 0.08)	Sites
1-VH	0.40-0.32	Mostagedda, Tell el-Dab'a, Qau el-Kebir
2-H	0.32-0.24	Sedment, Theban area, Matmar
3-M	0.24-0.16	Tell el-Maskhuta, Balabish
4-L	0.16-0.08	Abydos, Hu Lisht
5-VL	0.08-0	Deir el-Ballas, Tell Hebua, Tell el-Retaba, Elephantine, Tarkhan

Table 58: Eigenvector centrality scores of the first one-mode graph of the beads during the LSIP.

<i>Rank</i>	<i>Eigenvector centrality (scale: 0.084)</i>	<i>Sites</i>
1-VH	0.47–0.386	Qau el-Kebir, Sedment, Mostagedda
2-H	0.386–0.302	Tell Hebua
3-M	0.302–0.218	Matmar, Abydos, Theban area
4-L	0.218–0.134	Balabish, Hu
5-VL	0.134–0.05	Tell el-Dab'a, Tarkhan

Table 59: Eigenvector centrality scores of the first one-mode graph of the stone vessels during the LSIP.

<i>Rank</i>	<i>Eigenvector centrality (scale: 0.096)</i>	<i>Sites</i>
1-VH	0.5–0.404	Tell el-Yahudiyah, Tell el-Dab'a
2-H	0.404–0.308	Sedment, Mostagedda
3-M	0.308–0.212	Rifeh, Tell el-Maskhuta, Qau el-Kebir
4-L	0.212–0.116	Matmar, Hu
5-VL	0.116–0.02	Theban area, Ain Asil, Tell Hebua, Deir el-Ballas, Abydos, Tell el-Retaba

Table 60: Eigenvector centrality scores of the first one-mode graph of the scarab and seal designs during the LSIP.

<i>Rank</i>	<i>Eigenvector centrality (scale: 0.122)</i>	<i>Sites</i>
1-VH	0.65–0.528	Tell el-Dab'a, Tell el-Yahudiyah
2-H	0.528–0.406	–
3-M	0.406–0.284	–
4-L	0.284–0.162	Abydos, Hu, Harageh, Rifeh
5-VL	0.162–0.04	Edfu, Mostagedda, Tell Hebua, Sedment

Table 61: Eigenvector centrality scores of the first one-mode graph of the Tell el-Yahudiyah ware during the LSIP.

<i>Rank</i>	<i>Eigenvector centrality (scale: 0.106)</i>	<i>Sites</i>
1-VH	0.56–0.454	Tell el-Dab'a, Tell el-Maskhuta
2-H	0.454–0.348	-
3-M	0.348–0.242	Tell Hebua, Abydos, Sedment
4-L	0.242–0.136	Dishasha, Tarkhan, Abusir el-Meleq, Ain Asil, Kom el-Khilgan, Memphis
5-VL	0.136–0.03	Rifeh

Table 62: Eigenvector centrality scores of the first one-mode graph of the Cypriot pottery during the LSIP.

<i>Rank</i>	<i>Eigenvector centrality (scale: 0.106)</i>	<i>Sites</i>
1-VH	0.53–0.424	Tell el-Dab'a, Tell el-Maskhuta
2-H	0.424–0.318	Tell el-Yahudiyah
3-M	0.318–0.212	Tell Farasha, Mostagedda
4-L	0.212–0.106	-
5-VL	0.106–0	Balabish, Qau el-Kebir, Theban area

Table 63: Eigenvector centrality scores of the first one-mode graph of the weapons during the LSIP.

THE CLOSENESS CENTRALITY

The Late Middle Kingdom

<i>Rank</i>	<i>Closeness centrality (scale: 0.003)</i>	<i>Sites</i>
1-VH	0.027–0.024	Ain Asil, Ballas, Tod
2-H	0.024–0.021	Lisht, Rifeh
3-M	0.021–0.018	Elephantine, Hawara, Riqqeh, Hu, Denderah, Lahun, Qau el-Kebir, Armant, Theban area
4-L	0.018–0.015	Mostagedda, Matmar, Tell el-Dab'a, Esna, Dahshur
5-VL	0.015–0.012	El-Kab, Abydos, Edfu, Harageh

Table 64: Closeness centrality scores of the first one-mode graph of the beads during the LMK.

<i>Rank</i>	<i>Closeness centrality (scale: 1.67)</i>	<i>Sites</i>
1-VH	0.0035–0.0028	Matmar, Denderah, Dahshur, Lahun, Lisht, Rifeh, Ballas, Abydos, Esna, Qau el-Kebir, Qasr el-Sagha, Hawara, Tell el-Dab'a, Edfu, Harageh, Riqqeh, Hu, Mostagedda, Armant
2-H	0.0028–0.0021	–
3-M	0.0021–0.0014	–
4-L	0.0014–0.0007	–
5-VL	0.0007–0	Elephantine

Table 65: Closeness centrality scores of the first one-mode graph of the stone vessels during the LMK.

<i>Rank</i>	<i>Closeness centrality (scale: 0.003)</i>	<i>Sites</i>
1-VH	0.038–0.035	Ballas
2-H	0.035–0.032	Dahshur, Matmar
3-M	0.032–0.029	Edfu, Qau el-Kebir, Lahun
4-L	0.029–0.026	Riqqeh, Elephantine, Harageh, Esna, Tell el-Dab'a, Mostagedda
5-VL	0.026–0.023	Abydos, Denderah, Hu, Lisht, Nubt, Theban area

Table 66: Closeness centrality scores of the first one-mode graph of the scarab and seal designs during the LMK.

<i>Rank</i>	<i>Closeness centrality (scale: 0.008)</i>	<i>Sites</i>
1-VH	0.05–0.042	Lahun, Lisht, Tell el-Dab'a, Qasr el-Sagha, Harageh
2-H	0.042–0.034	Memphis
3-M	0.034–0.026	–
4-L	0.026–0.018	–
5-VL	0.018–0.01	Theban area

Table 67: Closeness centrality scores of the first one-mode graph of the Tell el-Yahudiyah ware during the LMK.

<i>Rank</i>	<i>Closeness centrality (scale: 0.002)</i>	<i>Sites</i>
1 –VH	0.015–0.013	Hu, Tell el-Dab'a, Qau el-Kebir, Harageh, Esna, Lisht
2–H	0.013–0.011	Lahun
3–M	0.011–0.009	–
4–L	0.009–0.007	–
5–VL	0.007–0.005	Abydos, Dahshur, Edfu

Table 68: Closeness centrality scores of the first one-mode graph of the weapons during the LMK.

The Early Second Intermediate Period

<i>Rank</i>	<i>Closeness centrality (scale: 0.01)</i>	<i>Sites</i>
1 –VH	0.1–0.09	Edfu, Tod
2–H	0.09–0.08	Tell el-Dab'a, Harageh, Abydos
3–M	0.08–0.07	–
4–L	0.07–0.06	–
5–VL	0.06–0.05	Qau el-Kebir, Ain Asil

Table 69: Closeness centrality scores of the first one-mode graph of the beads during the ESIP.

<i>Rank</i>	<i>Closeness centrality (scale: 0.0028)</i>	<i>Sites</i>
1–VH	0.024–0.0212	Edfu, Abydos, Tod
2–H	0.0212–0.0184	Tell el-Dab'a
3–M	0.0184–0.0156	–
4–L	0.0156–0.0128	–
5–VL	0.0128–0.01	Ain Asil, Qau el-Kebir

Table 70: Closeness centrality scores of the first one-mode graph of the stone vessels during the ESIP.

The Late Second Intermediate Period

<i>Rank</i>	<i>Closeness centrality (scale: 0.0003)</i>	<i>Sites</i>
1 –VH	0.017–0.0014	Tell Hebua, Deir el-Ballas, Hu, Tell el-Maskhuta, Tell el-Retaba, Qau el-Kebir, Tell el-Dab'a, Mostagedda, Theban area, Abydos, Matmar, Balabish, Sedment, Lisht
2–H	0.0014–0.0011	–
3–M	0.0011–0.0008	–
4–L	0.0008–0.0005	–
5–VL	0.0005–0.0002	Elephantine, Tarkhan

Table 71: Closeness centrality scores of the first one-mode graph of the beads during the LSIP.

<i>Rank</i>	<i>Closeness centrality (scale: 0.0046)</i>	<i>Sites</i>
1-VH	0.063–0.0584	Qau el-Kebir, Sedment, Tell Hebua, Hu
2-H	0.0584–0.0538	–
3-M	0.0538–0.0492	Theban area
4-L	0.0492–0.0446	Balabish, Mostagedda, Abydos, Tell el-Dab'a
5-VL	0.0446–0.04	Matmar, Tarkhan

Table 72: Closeness centrality scores of the first one-mode graph of the stone vessels during the LSIP.

<i>Rank</i>	<i>Closeness centrality (scale: 0.006)</i>	<i>Sites</i>
1-VH	0.06–0.054	Abydos
2-H	0.054–0.048	–
3-M	0.048–0.042	Tell el-Maskhuta
4-L	0.042–0.036	Hu, Tell Hebua, Sedment, Matmar, Tell el-Retaba, Rifeh, Ain Asil, Deir el-Ballas, Tell el-Yahudiyah, Tell el-Dab'a
5-VL	0.036–0.03	Mostagedda, Qau el-Kebir, Theban area

Table 73: Closeness centrality scores of the first one-mode graph of the scarab and seal designs during the LSIP.

<i>Rank</i>	<i>Closeness centrality (scale: 0.006)</i>	<i>Sites</i>
1-VH	0.077–0.071	Tell el-Dab'a,
2-H	0.071–0.065	Tell el-Yahudiyah, Rifeh
3-M	0.065–0.059	Harageh
4-L	0.059–0.053	Edfu, Mostagedda, Tell Hebua
5-VL	0.053–0.047	Abydos, Hu, Sedment

Table 74: Closeness centrality scores of the first one-mode graph of the Tell el-Yahudiyah ware during the LSIP.

<i>Rank</i>	<i>Closeness centrality (scale: 0.006)</i>	<i>Sites</i>
1-VH	0.07–0.064	Tell el-Dab'a, Abydos
2-H	0.064–0.058	Tell Hebua, Tell el-Maskhuta, Sedment
3-M	0.058–0.052	Dishasha, Abusir el-Meleq, Memphis
4-L	0.052–0.046	Tarkhan, Ain Asil, Kom el-Khilgan
5-VL	0.046–0.04	Rifeh

Table 75: Closeness centrality scores of the first one-mode graph of the Cypriot pottery during the LSIP.

<i>Rank</i>	<i>Closeness centrality (scale: 0.0052)</i>	<i>Sites</i>
1-VH	0.031–0.0258	Mostagedda, Tell el-Dab'a, Tell el-Maskhuta, Tell Farasha, Balabish, Qau el-Kebir, Tell el-Ya- hadiyah
2-H	0.0258–0.0206	–
3-M	0.0206–0.0154	–
4-L	0.0154–0.0102	–
5-VL	0.0102–0.005	Theban area

Table 76: Closeness centrality scores of the first one-mode graph of the weapons during the LSIP.

APPENDIX III

THE ONE-MODE GRAPH BASED ON THE JACCARD SIMILARITY

Tables 77–128 in this appendix report how the sites rank concerning the centrality measures in the second one-mode graph, based on the Jaccard similarity, for all the phases and objects examined in the present work.

This appendix is organized in the same way as [Appendix II](#). In other words, there are four sections, each for every one of the centrality measures examined and each divided into three subsections, for every chronological phase analysed in the present work. The tables and the ranks are also organized in the same way as for the centrality measures of the first one-mode graph, namely they start from the site with the highest score and then decrease to the one with the lowest score, and each rank corresponds to a line in the table.

THE DEGREE CENTRALITY

The Late Middle Kingdom

Rank	Degree centrality (scale: 0.468)	Sites
1-VH	3.55–3.082	Qau el-Kebir, Edfu, Abydos, Theban area, Matmar, Lahun, Hu
2-H	3.082–2.614	El-Kab, Rifeh, Mostagedda, Armant, Riqqeh, Elephantine, Denderah
3-M	2.614–2.146	Esna, Lisht, Harageh
4-L	2.146–1.678	Dahshur Tod, Hawara, Tell el-Dab'a
5-VL	1.678–1.21	Ballas, Ain Asil

Table 77: Degree centrality scores of the second one-mode graph of the beads during the LMK.

<i>Rank</i>	<i>Degree centrality (scale: 0.414)</i>	<i>Sites</i>
1-VH	2.07–1.656	Hu, Abydos, Riqqeh, Rifeh, Lahun
2-H	1.656–1.242	Edfu, Hawara, Harageh, Dahshur, Qasr el-Sagha
3-M	1.242–0.828	Qau el-Kebir, Esna, Ballas
4-L	0.828–0.414	Tell el-Dab'a, Denderah, Matmar, Lisht
5-VL	0.414–0	Mostagedda, Armant, Elephantine

Table 78: Degree centrality scores of the second one-mode graph of the stone vessels during the LMK.

<i>Rank</i>	<i>Degree centrality (scale: 0.988)</i>	<i>Sites</i>
1-VH	5.31–4.322	Elephantine, Harageh, Lahun, Lisht, Esna
2-H	4.322–3.334	Nubt, Abydos, Qau el-Kebir, Tell el-Dab'a
3-M	3.334–2.346	Riqqeh, Theban area, Matmar, Denderah
4-L	2.346–1.358	Mostagedda, Dahshur
5-VL	1.358–0.37	Ballas, Edfu, Hu

Table 79: Degree centrality scores of the second one-mode graph of the scarab and seal designs during the LMK.

<i>Rank</i>	<i>Degree centrality (scale: 0.144)</i>	<i>Sites</i>
1-VH	0.72–0.576	Lahun, Qasr el-Sagha
2-H	0.576–0.432	Lisht
3-M	0.432–0.288	Harageh, Tell el-Dab'a
4-L	0.288–0.144	–
5-VL	0.144–0	Memphis, Theban area

Table 80: Degree centrality scores of the second one-mode graph of the Tell el-Yahudiyah ware during the LMK.

<i>Rank</i>	<i>Degree centrality (scale: 0.106)</i>	<i>Sites</i>
1-VH	0.53–0.424	Hu
2-H	0.424–0.318	Lahun
3-M	0.318–0.212	Qau el-Kebir, Tell el-Dab'a
4-L	0.212–0.106	Harageh
5-VL	0.106–0	Esna, Lisht, Abydos, Dahshur, Edfu

Table 81: Degree centrality scores of the second one-mode graph of the weapons during the LMK.

The Early Second Intermediate Period

<i>Rank</i>	<i>Degree centrality (scale: 0.18)</i>	<i>Sites</i>
1-VH	1.1-0.92	Qau el-Kebir, Harageh, Ain Asil, Tell el-Dab'a
2-H	0.92-0.74	Abydos
3-M	0.74-0.56	-
4-L	0.56-0.38	Edfu
5-VL	0.38-0.2	Tod

Table 82: Degree centrality scores of the second one-mode graph of the beads during the ESIP.

<i>Rank</i>	<i>Degree centrality (scale: 0.038)</i>	<i>Sites</i>
1-VH	0.19-0.152	Edfu, Abydos
2-H	0.152-0.114	Tell el-Dab'a, Tod
3-M	0.114-0.076	-
4-L	0.076-0.038	-
5-VL	0.038-0	Ain Asil, Qau el-Kebir

Table 83: Degree centrality scores of the second one-mode graph of the stone vessels during the ESIP.

The Late Second Intermediate Period

<i>Rank</i>	<i>Degree centrality (scale: 0.43)</i>	<i>Sites</i>
1-VH	2.15-1.72	Balabish, Theban area, Qau el-Kebir, Sedment, Hu, Tell el-Maskhuta, Matmar
2-H	1.72-1.29	Mostagedda, Abydos, Tell el-Dab'a
3-M	1.29-0.86	Lisht
4-L	0.86-0.43	Deir el-Ballas, Tell Hebua
5-VL	0.43-0	Tell el-Retaba, Elephantine, Tarkhan

Table 84: Degree centrality scores of the second one-mode graph of the beads during the LSIP.

<i>Rank</i>	<i>Degree centrality (scale: 0.14)</i>	<i>Sites</i>
1-VH	0.7-0.56	Qau el-Kebir, Matmar, Sedment, Hu
2-H	0.56-0.42	Mostagedda
3-M	0.42-0.28	Tell Hebua, Abydos
4-L	0.28-0.14	Theban area, Balabish
5-VL	0.14-0	Tell el-Dab'a, Tarkhan

Table 85: Degree centrality scores of the second one-mode graph of the stone vessels during the LSIP.

<i>Rank</i>	<i>Degree centrality (scale: 0.62)</i>	<i>Sites</i>
1-VH	3.5–2.88	Tell el-Yahudiyah, Tell el-Dab'a, Sedment, Rifeh, Mostagedda
2-H	2.88–2.26	Tell el-Maskhuta
3-M	2.26–1.64	Qau el-Kebir, Matmar, Hu, Tell Hebua
4-L	1.64–1.02	–
5-VL	1.02–0.4	Abydos, Ain Asil, Deir el-Ballas, Theban area, Tell el-Retaba

Table 86: Degree centrality scores of the second one-mode graph of the scarab and seal designs during the LSIP.

<i>Rank</i>	<i>Degree centrality (scale: 0.198)</i>	<i>Sites</i>
1-VH	1–0.802	Tell el-Yahudiyah, Abydos
2-H	0.802–0.604	Rifeh, Harageh
3-M	0.604–0.406	Hu
4-L	0.406–0.208	Tell el-Dab'a
5-VL	0.208–0.01	Edfu, Mostagedda, Tell Hebua, Sedment

Table 87: Degree centrality scores of the second one-mode graph of the Tell el-Yahudiyah ware during the LSIP.

<i>Rank</i>	<i>Degree centrality (scale: 0.366)</i>	<i>Sites</i>
1-VH	2.16–1.794	Tell Hebua
2-H	1.794–1.428	Sedment, Abydos, Tarkhan
3-M	1.428–1.062	Abusir el-Meleq, Tell el-Maskhuta, Ain Asil, Kom el-Khilgan, Dishasha
4-L	1.062–0.696	Tell el-Dab'a
5-VL	0.696–0.33	Memphis, Rifeh

Table 88: Degree centrality scores of the second one-mode graph of the Cypriot pottery during the LSIP.

<i>Rank</i>	<i>Degree centrality (scale: 0.128)</i>	<i>Sites</i>
1-VH	0.64–0.512	Tell el-Maskhuta, Tell el-Dab'a, Mostagedda
2-H	0.512–0.384	Balabish, Qau el-Kebir, Tell el-Yahudiyah
3-M	0.384–0.256	Tell Farasha
4-L	0.256–0.128	–
5-VL	0.128–0	Theban area

Table 89: Degree centrality scores of the second one-mode graph of the weapons during the LSIP.

THE BETWEENNESS CENTRALITY

The Late Middle Kingdom

<i>Rank</i>	<i>Betweenness centrality (scale: 6.8)</i>	<i>Sites</i>
1-VH	34–27.2	Ballas, Tell el-Dab'a, Tod
2-H	27.2–20.4	Ain Asil
3-M	20.4–13.6	Dahshur
4-L	13.6–6.8	Harageh
5-VL	6.8–0	Denderah, Rifeh, Esna, Lahun, Armant, Lisht, Qau el-Kebir, Edfu, Abydos, Theban area, Matmar, Hu, El-Kab, Mostagedda, Riqqeh, Elephantine, Hawara

Table 90: Betweenness centrality scores of the second one-mode graph of the beads during the LMK.

<i>Rank</i>	<i>Betweenness centrality (scale: 4)</i>	<i>Sites</i>
1-VH	20–16	Denderah, Qau el-Kebir
2-H	16–12	Abydos, Hu, Harageh, Dahshur, Matmar
3-M	12–8	–
4-L	8–4	Edfu, Esna
5-VL	4–0	Rifeh, Ballas, Riqqeh, Lahun, Hawara, Qasr el-Sagha, Tell el-Dab'a, Lisht, Mostagedda, Armant, Elephantine

Table 91: Betweenness centrality scores of the second one-mode graph of the stone vessels during the LMK.

<i>Rank</i>	<i>Betweenness centrality (scale: 8)</i>	<i>Sites</i>
1-VH	40–32	Ballas
2-H	32–24	Lahun
3-M	24–16	–
4-L	16–8	Edfu, Esna
5-VL	8–0	Lisht, Dahshur, Hu, Elephantine, Tell el-Dab'a, Matmar, Nubt, Abydos, Riqqeh, Harageh, Qau el-Kebir, Theban area, Denderah, Mostagedda

Table 92: Betweenness centrality scores of the second one-mode graph of the scarab and seal designs during the LMK.

<i>Rank</i>	<i>Betweenness centrality (scale: 0.8)</i>	<i>Sites</i>
1-VH	4-3.2	Tell el-Dab'a
2-H	3.2-2.4	Lisht
3-M	2.4-1.6	-
4-L	1.6-0.8	-
5-VL	0.8-0	Lahun, Qasr el-Sagha, Harageh, Memphis, Theban area

Table 93: Betweenness centrality scores of the second one-mode graph of the Tell el-Yahudiyah ware during the LMK.

<i>Rank</i>	<i>Betweenness centrality (scale: 2.2)</i>	<i>Sites</i>
1-VH	11-8.8	Hu, Tell el-Dab'a
2-H	8.8-6.6	-
3-M	6.6-4.4	-
4-L	4.4-2.2	-
5-VL	2.2-0	Abydos, Dahshur, Edfu, Esna, Harageh, Lahun, Lisht, Qau el-Kebir

Table 94: Betweenness centrality scores of the second one-mode graph of the weapons during the LMK.

The Early Second Intermediate Period

<i>Rank</i>	<i>Betweenness centrality (scale: 0.9)</i>	<i>Sites</i>
1-VH	4.5-3.6	Edfu
2-H	3.6-2.7	-
3-M	2.7-1.8	Tod, Tell el-Dab'a
4-L	1.8-0.9	-
5-VL	0.9-0	Qau el-Kebir, Harageh, Ain Asil, Abydos

Table 95: Betweenness centrality scores of the second one-mode graph of the beads during the ESIP.

<i>Rank</i>	<i>Betweenness centrality (scale: 0.4)</i>	<i>Sites</i>
1-VH	2-1.6	Edfu, Abydos
2-H	1.6-1.2	-
3-M	1.2-0.8	-
4-L	0.8-0.4	-
5-VL	0.4-0	Tell el-Dab'a, Tod, Ain Asil, Qau el-Kebir

Table 96: Betweenness centrality scores of the second one-mode graph of the stone vessels during the ESIP.

The Late Second Intermediate Period

<i>Rank</i>	<i>Betweenness centrality (scale: 8)</i>	<i>Sites</i>
1-VH	40-32	Tell Hebua
2-H	32-24	Tell el-Dab'a
3-M	24-16	—
4-L	16-8	Tell el-Retaba
5-VL	8-0	Tell el-Maskhuta, Abydos, Balabish, Deir el-Ballas, Elephantine, Hu, Lisht, Matmar, Mostagedda, Qau el-Kebir, Sedment, Tarkhan, Theban area

Table 97: Betweenness centrality scores of the second one-mode graph of the beads during the LSIP.

<i>Rank</i>	<i>Betweenness centrality (scale: 3.8)</i>	<i>Sites</i>
1-VH	19-15.2	Tell Hebua, Sedment
2-H	15.2-11.4	—
3-M	11.4-7.6	—
4-L	7.6-3.8	Mostagedda, Qau el-Kebir
5-VL	3.8-0	Matmar, Hu, Abydos, Theban area, Balabish, Tell el-Dab'a, Tarkhan

Table 98: Betweenness centrality scores of the second one-mode graph of the stone vessels during the LSIP.

<i>Rank</i>	<i>Betweenness centrality (scale: 6.2)</i>	<i>Sites</i>
1-VH	31-24.8	Abydos
2-H	24.8-18.6	—
3-M	18.6-12.4	Tell el-Yahudiyah
4-L	12.4-6.2	—
5-VL	6.2-0	Tell el-Retaba, Tell el-Dab'a, Tell el-Maskhuta, Matmar, Hu, Sedment, Ain Asil, Deir el-Ballas, Theban area, Rifeh, Mostagedda, Qau el-Kebir, Tell Hebua

Table 99: Betweenness centrality scores of the second one-mode graph of the scarab and seal designs during the LSIP.

<i>Rank</i>	<i>Betweenness centrality (scale: 6.2)</i>	<i>Sites</i>
1-VH	31-24.8	Tell el-Dab'a
2-H	24.8-18.6	—
3-M	18.6-12.4	—
4-L	12.4-6.2	—
5-VL	6.2-0	Edfu, Mostagedda, Tell Hebua, Abydos, Tell el-Yahudiyah, Harageh, Rifeh, Hu, Sedment

Table 100: Betweenness centrality scores of the second one-mode graph of the Tell el-Yahudiyah ware during the LSIP.

<i>Rank</i>	<i>Betweenness centrality (scale: 9.6)</i>	<i>Sites</i>
1-VH	48–38.4	Tell el-Dab'a
2-H	38.4–28.8	–
3-M	28.8–19.2	–
4-L	19.2–9.6	Abydos
5-VL	9.6–0	Abusir el-Meleq, Ain Asil, Dishasha, Kom el-Khilgan, Memphis, Rifeh, Sedment, Tarkhan, Tell el-Maskhuta, Tell Hebua

Table 101: Betweenness centrality scores of the second one-mode graph of the Cypriot pottery during the LSIP.

<i>Rank</i>	<i>Betweenness centrality (scale: 1.9)</i>	<i>Sites</i>
1-VH	9.5–7.6	Mostagedda
2-H	7.6–5.7	–
3-M	5.7–3.8	–
4-L	3.8–1.9	Tell el-Dab'a, Tell el-Maskhuta
5-VL	1.9–0	Balabish, Qau el-Kebir, Tell el-Yahudiyah, Tell Farasha, Theban area

Table 102: Betweenness centrality scores of the second one-mode graph of the weapons during the LSIP.

THE EIGENVECTOR CENTRALITY

The Late Middle Kingdom

<i>Rank</i>	<i>Eigenvector centrality (scale: 0.04)</i>	<i>Sites</i>
1-VH	0.28–0.24	Qau el-Kebir, Edfu, Abydos, Theban area, Matmar
2-H	0.24–0.2	Hu, Lahun, El-Kab, Mostagedda, Rifeh, Armant, Riqqeh, Denderah, Elephantine
3-M	0.2–0.16	Esna, Harageh, Lisht, Tod
4-L	0.16–0.12	Dahshur, Hawara, Tell el-Dab'a
5-VL	0.12–0.08	Ballas, Ain Asil

Table 103: Eigenvector centrality scores of the second one-mode graph of the beads during the LMK.

<i>Rank</i>	<i>Eigenvector centrality (scale: 0.07)</i>	<i>Sites</i>
1-VH	0.35–0.28	Hu, Abydos, Riqqeh, Rifeh
2-H	0.28–0.21	Lahun, Edfu, Harageh, Dahshur, Hawara
3-M	0.21–0.14	Qasr el-Sagha, Qau el-Kebir, Esna, Ballas
4-L	0.14–0.07	Tell el-Dab'a, Denderah, Matmar, Lisht
5-VL	0.07–0	Mostagedda, Armant, Elephantine

Table 104: Eigenvector centrality scores of the second one-mode graph of the stone vessels during the LMK.

<i>Rank</i>	<i>Eigenvector centrality (scale: 0.07)</i>	<i>Sites</i>
1-VH	0.36–0.29	Elephantine, Lahun, Harageh, Lisht, Esna, Nubt
2-H	0.29–0.22	Abydos, Tell el-Dab'a, Qau el-Kebir
3-M	0.22–0.15	Riqqeh, Theban area, Denderah, Matmar
4-L	0.15–0.08	Mostagedda, Dahshur
5-VL	0.08–0.01	Ballas, Edfu, Hu

Table 105: Eigenvector centrality scores of the second one-mode graph of the scarab and seal designs during the LMK.

<i>Rank</i>	<i>Eigenvector centrality (scale: 0.096)</i>	<i>Sites</i>
1-VH	0.48–0.384	Lahun, Qasr el-Sagha, Lisht
2-H	0.384–0.288	Harageh
3-M	0.288–0.192	Tell el-Dab'a
4-L	0.192–0.096	–
5-VL	0.096–0	Memphis, Theban area

Table 106: Eigenvector centrality scores of the second one-mode graph of the Tell el-Yahudiyah ware during the LMK.

<i>Rank</i>	<i>Eigenvector centrality (scale: 0.086)</i>	<i>Sites</i>
1-VH	0.43–0.344	Hu, Lahun, Qau el-Kebir
2-H	0.344–0.258	–
3-M	0.258–0.172	Harageh
4-L	0.172–0.086	–
5-VL	0.086–0	Tell el-Dab'a, Esna, Lisht, Abydos, Dahshur, Edfu

Table 107: Eigenvector centrality scores of the second one-mode graph of the weapons during the LMK.

The Early Second Intermediate Period

Rank	Eigenvector centrality (scale: 0.076)	Sites
1-VH	0.48–0.404	Qau el-Kebir, Harageh, Tell el-Dab'a, Ain Asil
2-H	0.404–0.328	Abydos
3-M	0.328–0.252	–
4-L	0.252–0.176	Edfu
5-VL	0.176–0.1	Tod

Table 108: Eigenvector centrality scores of the second one-mode graph of the beads during the ESIP.

Rank	Eigenvector centrality (scale: 0.08)	Sites
1-VH	0.4–0.32	Edfu, Tell el-Dab'a, Abydos
2-H	0.32–0.24	Tod
3-M	0.24–0.16	–
4-L	0.16–0.08	–
5-VL	0.08–0	Ain Asil, Qau el-Kebir

Table 109: Eigenvector centrality scores of the second one-mode graph of the stone vessels during the ESIP.

The Late Second Intermediate Period

Rank	Eigenvector centrality (scale: 0.062)	Sites
1-VH	0.31–0.248	Balabish, Qau el-Kebir, Theban area, Sedment, Matmar, Tell el-Maskhuta, Mostagedda
2-H	0.248–0.186	Hu, Abydos, Tell el-Dab'a
3-M	0.186–0.124	Lisht
4-L	0.124–0.062	Deir el-Ballas, Tell Hebua
5-VL	0.062–0	Tell el-Retaba, Elephantine, Tarkhan

Table 110: Eigenvector centrality scores of the second one-mode graph of the beads during the LSIP.

Rank	Eigenvector centrality (scale: 0.098)	Sites
1-VH	0.54–0.442	Matmar, Hu
2-H	0.442–0.344	Qau el-Kebir, Sedment
3-M	0.344–0.246	Mostagedda
4-L	0.246–0.148	Abydos, Tell Hebua
5-VL	0.148–0.05	Theban area, Balabish, Tarkhan, Tell el-Dab'a

Table 111: Eigenvector centrality scores of the second one-mode graph of the stone vessels during the LSIP.

<i>Rank</i>	<i>Eigenvector centrality (scale: 0.074)</i>	<i>Sites</i>
1-VH	0.41–0.336	Tell el-Yahudiyah, Tell el-Dab'a, Sedment, Rifeh
2-H	0.336–0.262	Mostagedda, Tell el-Maskhuta, Qau el-Kebir
3-M	0.262–0.188	Matmar, Hu
4-L	0.188–0.114	Tell Hebua
5-VL	0.114–0.04	Theban area, Ain Asil, Deir el-Ballas, Abydos, Tell el-Retaba

Table 112: Eigenvector centrality scores of the second one-mode graph of the scarab and seal designs during the LSIP.

<i>Rank</i>	<i>Eigenvector centrality (scale: 0.1046)</i>	<i>Sites</i>
1-VH	0.529–0.4244	Abydos, Tell el-Yahudiyah, Rifeh
2-H	0.4244–0.3198	Harageh, Hu
3-M	0.3198–0.2152	Tell el-Dab'a
4-L	0.2152–0.1106	–
5-VL	0.1106–0.006	Edfu, Mostagedda, Tell Hebua, Sedment

Table 113: Eigenvector centrality scores of the second one-mode graph of the Tell el-Yahudiyah ware during the LSIP.

<i>Rank</i>	<i>Eigenvector centrality (scale: 0.086)</i>	<i>Sites</i>
1-VH	0.48–0.394	Tell Hebua, Tarkhan, Sedment, Abusir el-Meleq
2-H	0.394–0.308	–
3-M	0.308–0.222	Dishasha, Abydos
4-L	0.222–0.136	Tell el-Maskhuta, Tell el-Dab'a
5-VL	0.136–0.05	Ain Asil, Kom el-Khilgan, Memphis, Rifeh

Table 114: Eigenvector centrality scores of the second one-mode graph of the Cypriot pottery during the LSIP.

<i>Rank</i>	<i>Eigenvector centrality (scale: 0.084)</i>	<i>Sites</i>
1-VH	0.42–0.336	Tell el-Maskhuta, Tell el-Dab'a
2-H	0.336–0.252	Mostagedda, Tell el-Yahudiyah, Balabish, Qau el-Kebir
3-M	0.252–0.168	Tell Farasha
4-L	0.168–0.084	–
5-VL	0.084–0	Theban area

Table 115: Eigenvector centrality scores of the second one-mode graph of the weapons during the LSIP.

THE CLOSENESS CENTRALITY

The Late Middle Kingdom

<i>Rank</i>	<i>Closeness centrality (scale: 0.08)</i>	<i>Sites</i>
1-VH	0.78–0.70	Ain Asil, Dahshur, Ballas, Harageh, Tod, Tell el-Dab'a
2-H	0.70–0.62	Rifeh, Lahun, Esna
3-M	0.62–0.54	Denderah, Armant, Qau el-Kebir, Mostagedda, Riqqeh
4-L	0.54–0.46	Hu, Matmar, Lisht, Hawara, Elephantine
5-VL	0.46–0.38	Abydos, Theban area, El-Kab, Edfu

Table 116: Closeness centrality scores of the second one-mode graph of the beads during the LMK.

<i>Rank</i>	<i>Closeness centrality (scale: 0.028)</i>	<i>Sites</i>
1-VH	0.14–0.112	Matmar, Denderah, Harageh, Edfu, Dahshur, Abydos, Hu, Rifeh, Tell el-Dab'a, Lisht, Esna, Qau el-Kebir, Ballas, Lahun, Qasr el-Sagha, Mostagedda, Hawara, Riqqeh, Armant
2-H	0.112–0.084	–
3-M	0.084–0.056	–
4-L	0.056–0.028	–
5-VL	0.028–0	Elephantine

Table 117: Closeness centrality scores of the second one-mode graph of the stone vessels during the LMK.

<i>Rank</i>	<i>Closeness centrality (scale: 0.064)</i>	<i>Sites</i>
1-VH	0.62–0.556	Ballas, Lahun
2-H	0.556–0.492	Edfu, Elephantine, Hu, Esna
3-M	0.492–0.428	Lisht, Nubt, Abydos, Harageh
4-L	0.428–0.364	Dahshur, Tell el-Dab'a, Matmar
5-VL	0.364–0.3	Riqqeh, Mostagedda, Qau el-Kebir, Denderah, Theban area

Table 118: Closeness centrality scores of the second one-mode graph of the scarab and seal designs during the LMK.

<i>Rank</i>	<i>Closeness centrality (scale: 0.066)</i>	<i>Sites</i>
1-VH	0.42–0.354	Tell el-Dab'a, Lisht, Lahun, Memphis
2-H	0.354–0.288	Qasr el-Sagha, Harageh
3-M	0.288–0.222	–
4-L	0.222–0.156	–
5-VL	0.156–0.09	Theban area

Table 119: Closeness centrality scores of the second one-mode graph of the Tell el-Yahudiyah ware during the LMK.

<i>Rank</i>	<i>Closeness centrality (scale: 0.02)</i>	<i>Sites</i>
1-VH	0.16–0.14	Hu, Tell el-Dab'a, Esna, Lisht, Qau el-Kebir, Harageh, Lahun
2-H	0.14–0.12	–
3-M	0.12–0.10	–
4-L	0.10–0.08	–
5-VL	0.08–0.06	Abydos, Dahshur, Edfu

Table 120: Closeness centrality scores of the second one-mode graph of the weapons during the LMK.

The Early Second Intermediate Period

<i>Rank</i>	<i>Closeness centrality (scale: 0.23)</i>	<i>Sites</i>
1-VH	2.15–1.92	Edfu, Tell el-Dab'a, Tod, Harageh
2-H	1.92–1.69	–
3-M	1.69–1.46	–
4-L	1.46–1.23	Qau el-Kebir
5-VL	1.23–1	Abydos, Ain Asil

Table 121: Closeness centrality scores of the second one-mode graph of the beads during the ESIP.

<i>Rank</i>	<i>Closeness centrality (scale: 0.054)</i>	<i>Sites</i>
1-VH	0.51–0.456	Edfu, Abydos
2-H	0.456–0.402	Tod, Tell el-Dab'a
3-M	0.402–0.348	–
4-L	0.348–0.294	–
5-VL	0.294–0.24	Ain Asil, Qau el-Kebir

Table 122: Closeness centrality scores of the second one-mode graph of the stone vessels during the ESIP.

The Late Second Intermediate Period

<i>Rank</i>	<i>Closeness centrality (scale: 0.022)</i>	<i>Sites</i>
1-VH	0.11–0.088	Tell Hebua, Tell el-Dab'a, Tell el-Retaba, Mostagedda, Deir el-Ballas, Qau el-Kebir, Lisht, Tell el-Maskhuta, Sedment, Theban area, Matmar, Hu, Balabish, Abydos
2-H	0.088–0.066	–
3-M	0.066–0.044	–
4-L	0.044–0.022	–
5-VL	0.022–0	Elephantine, Tarkhan

Table 123: Closeness centrality scores of the second one-mode graph of the beads during the LSIP.

<i>Rank</i>	<i>Closeness centrality (scale: 0.146)</i>	<i>Sites</i>
1-VH	1.33–1.184	Tell Hebua, Sedment, Qau el-Kebir
2-H	1.184–1.038	–
3-M	1.038–0.892	Theban area, Mostagedda, Tell el-Dab'a
4-L	0.892–0.746	Hu, Abydos, Balabish
5-VL	0.746–0.6	Tarkhan, Matmar

Table 124: Closeness centrality scores of the second one-mode graph of the stone vessels during the LSIP.

<i>Rank</i>	<i>Closeness centrality (scale: 0.096)</i>	<i>Sites</i>
1-VH	1.01–0.914	Abydos, Tell el-Yahudiyah
2-H	0.914–0.818	Tell el-Dab'a, Tell el-Retaba
3-M	0.818–0.722	Tell Hebua, Sedment
4-L	0.722–0.626	Tell el-Maskhuta, Deir el-Ballas, Ain Asil, Qau el-Kebir, Mostagedda
5-VL	0.626–0.53	Theban area, Rifeh, Matmar, Hu

Table 125: Closeness centrality scores of the second one-mode graph of the scarab and seal designs during the LSIP.

<i>Rank</i>	<i>Closeness centrality (scale: 0.428)</i>	<i>Sites</i>
1-VH	3.18–2.752	Tell el-Dab'a
2-H	2.752–2.324	Edfu, Mostagedda, Tell Hebua
3-M	2.324–1.896	Rifeh, Sedment
4-L	1.896–1.468	Harageh, Hu
5-VL	1.468–1.04	Abydos, Tell el-Yahudiyah

Table 126: Closeness centrality scores of the second one-mode graph of the Tell el-Yahudiyah ware during the LSIP.

<i>Rank</i>	<i>Closeness centrality (scale: 0.1238)</i>	<i>Sites</i>
1-VH	0.823–0.6992	Tell el-Dab'a
2-H	0.6992–0.5754	Abydos
3-M	0.5754–0.4516	Sedment, Tarkhan, Memphis, Dishasha, Ain Asil, Kom el-Khilgan, Abusir el-Meleq
4-L	0.4516–0.3278	Tell Hebua, Tell el-Maskhuta
5-VL	0.3278–0.204	Rifeh

Table 127: Closeness centrality scores of the second one-mode graph of the Cypriot pottery during the LSIP.

<i>Rank</i>	<i>Closeness centrality (scale: 0.046)</i>	<i>Sites</i>
1-VH	0.28–0.234	Mostagedda, Tell el-Dab'a, Tell el-Maskhuta, Tell Farasha, Tell el-Yahudiyah
2-H	0.234–0.188	Balabish, Qau el-Kebir
3-M	0.188–0.142	–
4-L	0.142–0.096	–
5-VL	0.096–0.05	Theban area

Table 128: Closeness centrality scores of the second one-mode graph of the weapons during the LSIP.

APPENDIX IV

CORRESPONDENCE ANALYSIS

This appendix reports the results of the correspondence analysis conducted in the present work, for all the chronological phases and the objects analysed, and for both one-mode graphs. This analysis studies the relations between the variety of types retrieved at the sites and how the same sites score for the different measures.

This appendix is divided into three sections, each for every chronological phase studied in the present work. Each section is further divided into three subsections. The first subsection concerns the number of types retrieved at the sites for each class of objects, and how the sites are grouped based on this amount. The remaining two subsections concern the measures respectively detected for the first one-mode graph and for the second one-mode graph, based on the Jaccard similarity.

THE LATE MIDDLE KINGDOM

For the Late Middle Kingdom, the following numbers of types and the groups of sites have been detected for the following category of objects.

Beads:

- 3–23 types – VLV: Lisht, Hawara, Riqqeh, Mostagedda, Hu, Denderah, Theban area, Tod, Elephantine, Ain Anil, Rifeh, Ballas, El-Kab;
- 23–43 types – LV: Tell el-Dab'a, Lahun, Matmar, Qau el-Kebir, Abydos, Armant, Edfu;
- 43–63 types – MV: Esna;
- 63–83 types – HV: Dahshur;
- 83–103 types – VHV: Harageh.

Stone vessels:

- 1–6 types – VLV: Armant, Elephantine, Hawara, Lisht, Matmar, Mostagedda, Tell el-Dab'a, Denderah, Qasr el-Sagha, Ballas.

- 7–12 types – LV: Lahun, Riqqeh, Qau el-Kebir;
- 13–18 types – MV: Dahshur, Rifeh, Esna;
- 19–24 types – HV: no sites;
- 25–30 types – VHV: Edfu, Abydos, Harageh, Hu.

Scarab and seal designs:

- 1–7 types – VLV: Riqqeh, Mostagedda, Matmar, Denderah, Theban area, Dahshur, Edfu, Ballas, Hu;
- 8–14 types – LV: Abydos, Tell el-Dab'a, Qau el-Kebir;
- 15–21 types – MV: Harageh, Nubt;
- 22–28 types – HV: Elephantine, Esna, Lisht;
- 29–35 types – VHV: Lahun.

Tell el-Yahudiyah ware:

- 1–2 types – VLV: Memphis, Theban area, Harageh, Qasr el-Sagha;
- 3–4 types – LV: Lahun;
- 5–6 types – MV: Lisht;
- 7–8 types – HV: no sites;
- 9–11 types – VHV: Tell el-Dab'a.

Weapons:

- 1–3 types – VLV: Abydos, Dahshur, Edfu, Esna, Harageh, Lisht, Qau el-Kebir;
- 4–5 types – LV: no sites;
- 6–7 types – MV: Hu, Lahun;
- 8–9 types – HV: no sites;
- 10–11 types – VHV: Tell el-Dab'a.

The first one-mode graph

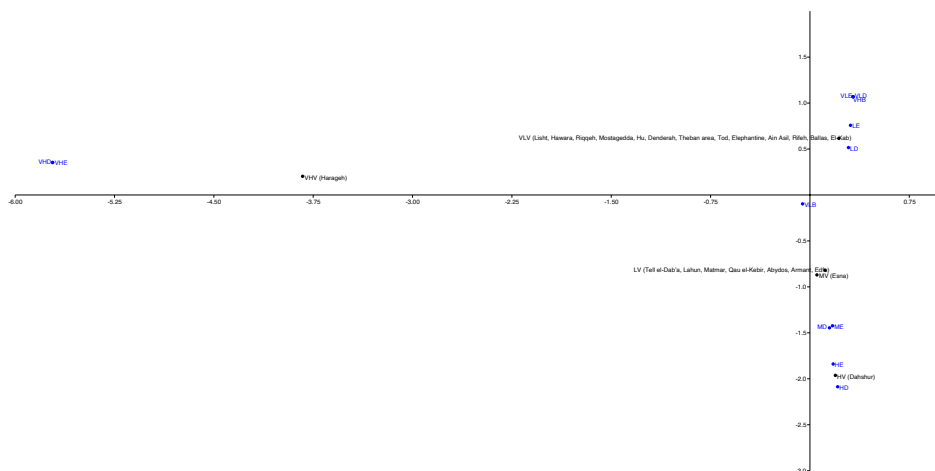


Diagram 1: Correspondence analysis beads LMK First one-mode graph.

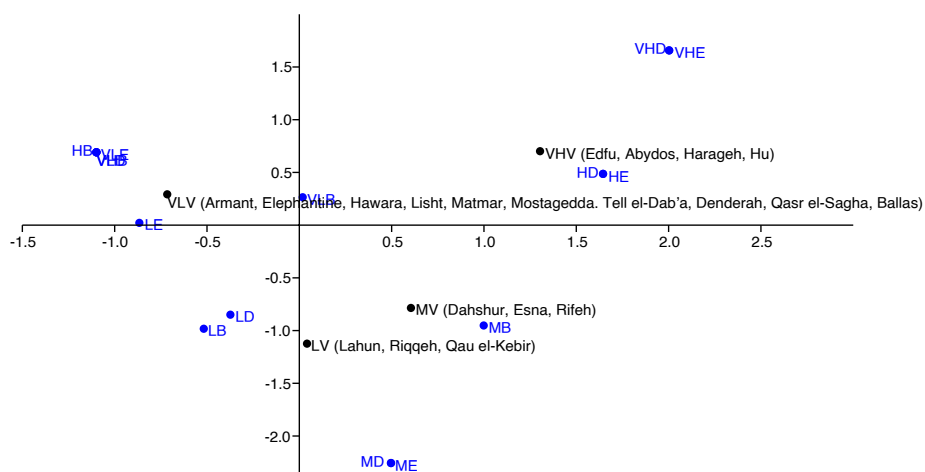


Diagram 2: Correspondence analysis stone vessels LMK First one-mode graph.

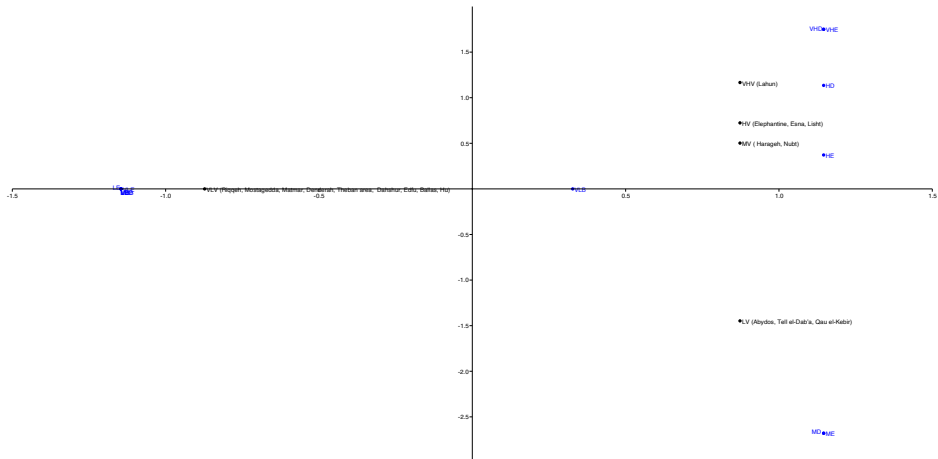


Diagram 3: Correspondence analysis scarab and seal designs LMK First one-mode graph.

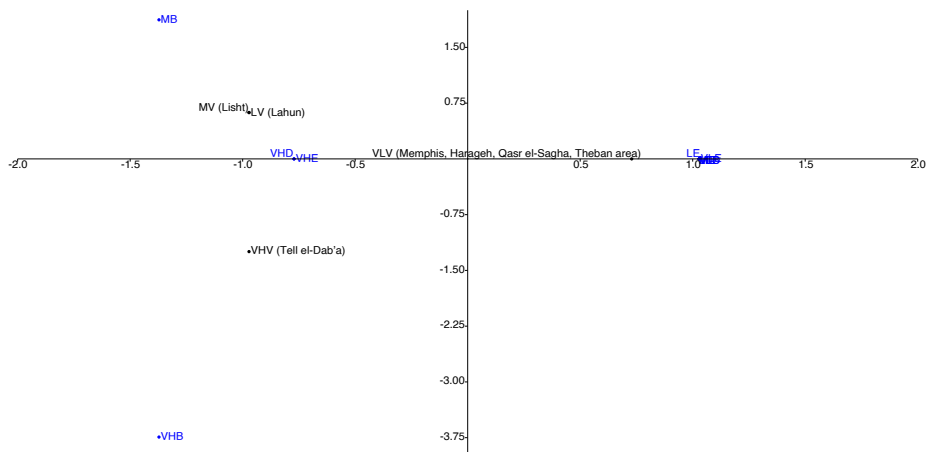


Diagram 4: Correspondence analysis Tell el-Yahudiyah ware LMK First one-mode graph.

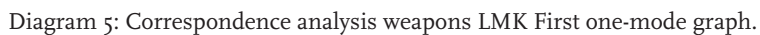
[illegible]

Diagram 6: Correspondence analysis beads LMK Second one-mode graph.

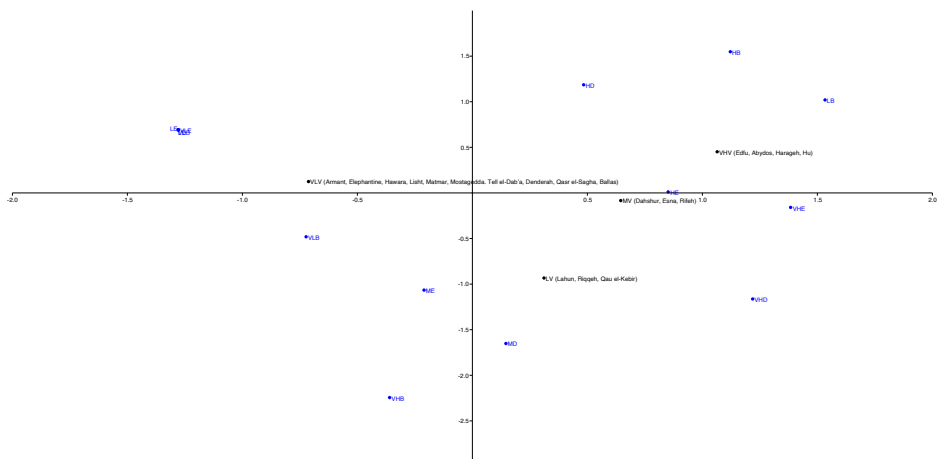


Diagram 7: Correspondence analysis stone vessels LMK Second one-mode graph.

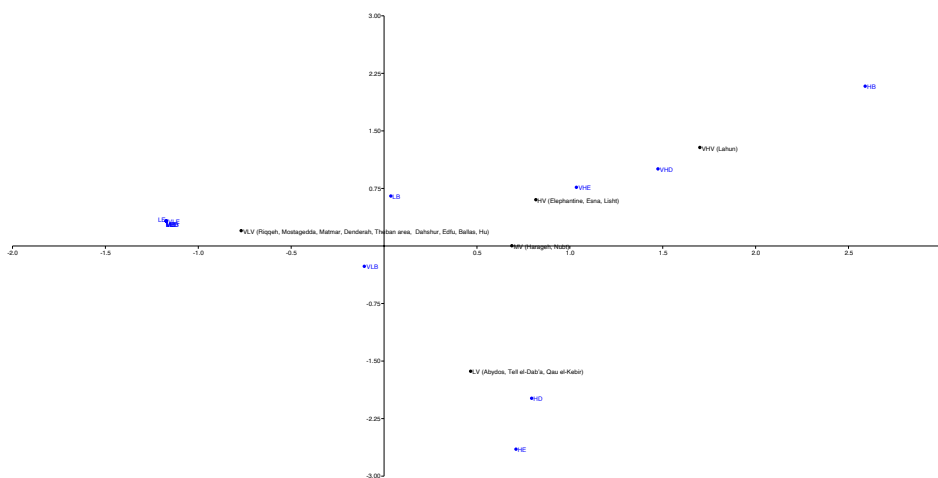


Diagram 8: Correspondence analysis scarab and seal designs LMK Second one-mode graph.

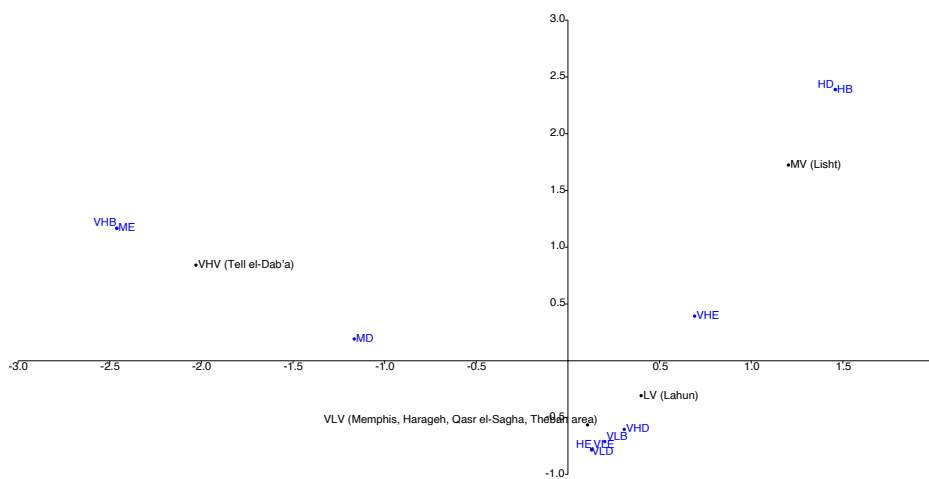


Diagram 9: Correspondence analysis Tell el-Yahudiyah ware LMK Second one-mode graph.

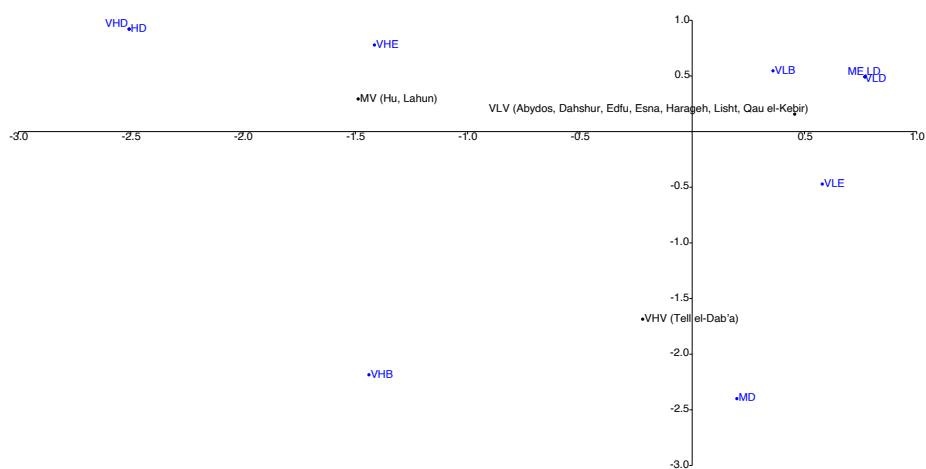


Diagram 10: Correspondence analysis weapons LMK Second one-mode graph.

THE EARLY SECOND INTERMEDIATE PERIOD

For the Early Second Intermediate Period, the numbers of types and the groups of sites for each category of objects are as follows.

Beads:

- 4–10 types – VLV: Abydos, Tod, Edfu;
- 11–16 types – LV: Ain Asil;
- 17–22 types – MV: no sites;
- 23–28 types – HV: Qau el-Kebir;
- 29–34 types – VHV: Tell el-Dab'a, Harageh.

Stone vessels:

- 1–4 types – VLV: Tod, Qau el-Kebir;
- 5–7 types – LV: Ain Asil;
- 8–10 types – MV: Abydos;
- 11–13 types – HV: Tell el-Dab'a;
- 14–16 types – VHV: Edfu.

The first one-mode graph

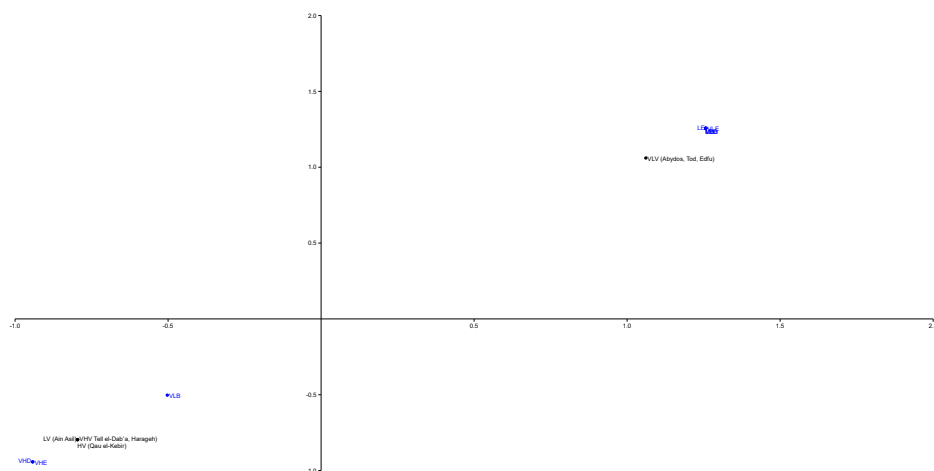


Diagram 11: Correspondence analysis beads ESIP First one-mode graph.

[illegible]

Diagram 13: Correspondence analysis beads ESIP Second one-mode graph.

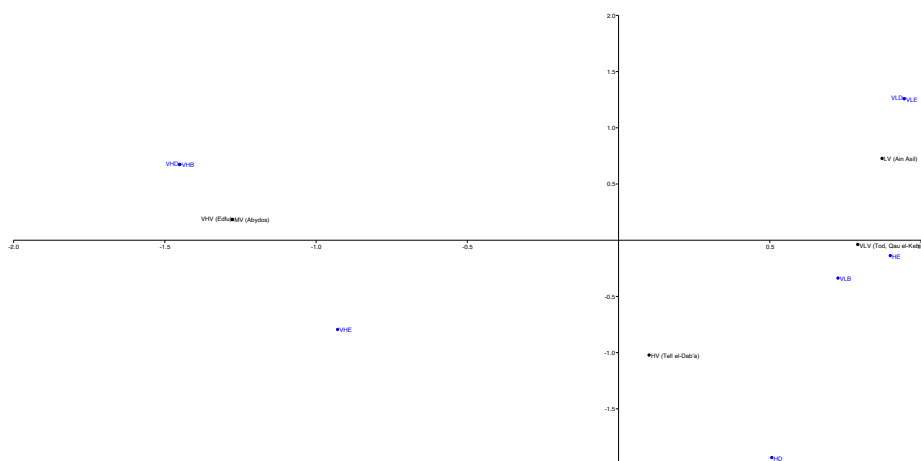


Diagram 14: Correspondence analysis Stone vessels ESIP Second one-mode graph.

THE LATE SECOND INTERMEDIATE PERIOD

For the Late Second Intermediate Period, the number of types and the groups of sites for each category of objects are the following.

Beads:

- 1–12 types – VLV: Hu, Deir el-Ballas, Tell el-Retaba, Tarkhan, Abydos, Elephantine, Tell Hebua;
- 13–24 types – LV: Tell el-Maskhuta, Matmar, Balabish, Lisht, Theban area;
- 25–36 types – MV: Sedment;
- 37–48 types – HV: Qau el-Kebir;
- 49–60 types – VHV: Mostagedda, Tell el-Dab'a.

Stone vessels:

- 1–4 types – VLV: Tarkhan, Matmar, Hu;
- 5–7 types – LV: Balabish;
- 8–10 types – MV: Tell el-Dab'a, Mostagedda, Abydos, Theban area;
- 11–13 types – HV: no sites;
- 14–16 types – VHV: Sedment, Qau el-Kebir, Tell Hebua.

Scarab and seal designs:

- 1–8 types – VLV: Ain Asil, Theban area, Tell Hebua, Deir el-Ballas, Tell el-Retaba, Abydos;

- 9–17 types – LV: Rifeh, Tell el-Maskhuta, Hu, Matmar;
- 18–26 types – MV: Qau el-Kebir, Mostagedda, Sedment;
- 27–35 types – HV: Tell el-Dab’a;
- 36–44 types – VHV: Tell el-Yahudiyah.

Tell el-Yahudiyah ware:

- 1–12 types – VLV: Rifeh, Hu, Abydos, Harageh, Edfu, Sedment, Mostagedda, Tell Hebua;
- 13–24 types – LV: Tell el-Yahudiyah;
- 25–36 types – MV: no sites;
- 37–48 types – HV: no sites;
- 49–60 types – VHV: Tell el-Dab’a.
- types: no sites;

Cypriot pottery:

- 1–3 types – VLV: Abydos, Sedment, Memphis, Tarkhan, Tell Hebua, Abusir el-Meleq, Ain Asil, Dishasha, Kom el-Khilgan, Rifeh;
- 4–6 type – LV: Tell el-Maskhuta;
- 7–9 types – MV: no sites;
- 10–12 types –HV: no sites;
- 13–16 types –VHV: Tell el-Dab’a.

Weapons:

- 2 types – VLV: Balabish, Qau el-Kebir, Theban area;
- 3–4 type – LV: Tell el-Yahudiyah, Tell Farasha;
- 5–6 types – MV: Mostagedda, Tell el-Maskhuta;
- 7–8 types –HV: no sites;
- 9 types –VHV: Tell el-Dab’a.

The first one-mode graph

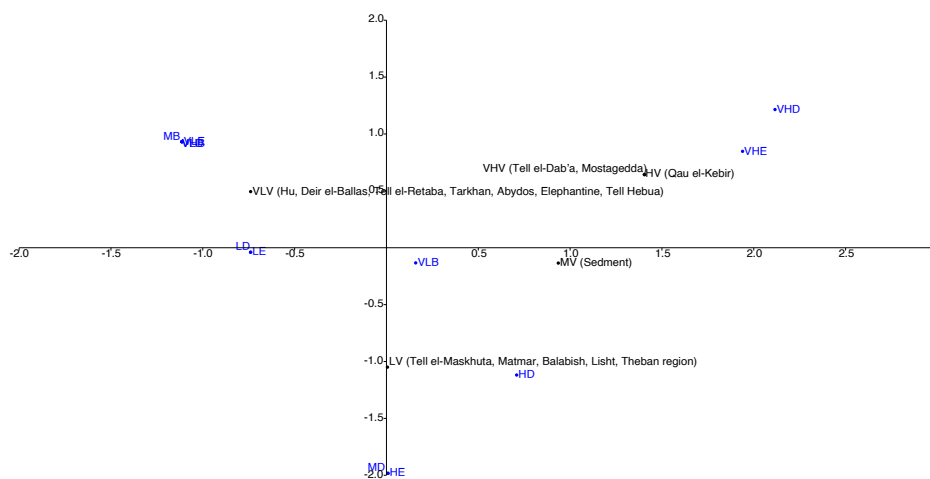


Diagram 15: Correspondence analysis Beads LSIP First one-mode graph.

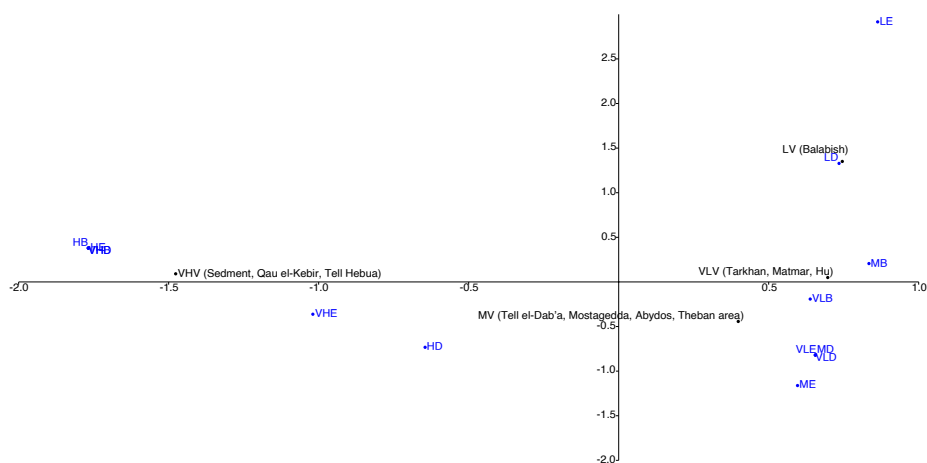
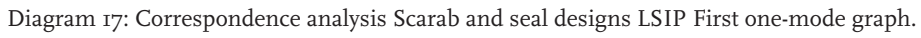


Diagram 16: Correspondence analysis Stone vessels LSIP First one-mode graph.



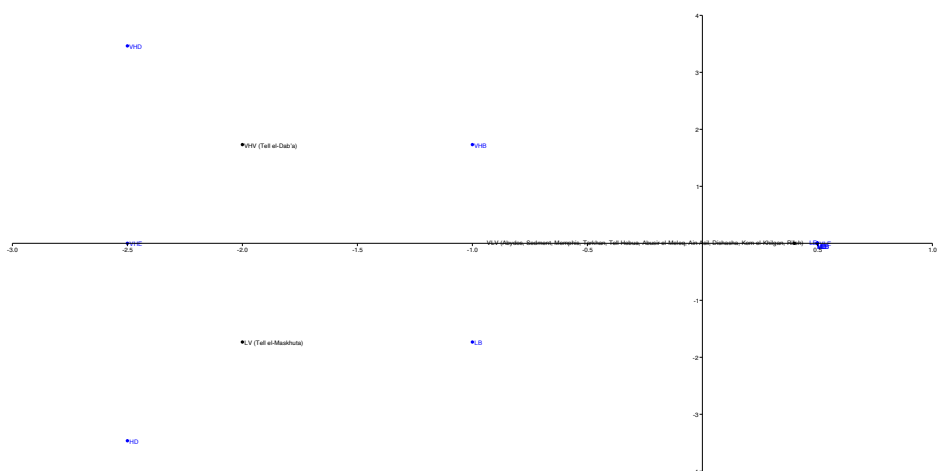


Diagram 19: Correspondence analysis Cypriot pottery LSIP. First one-mode graph.

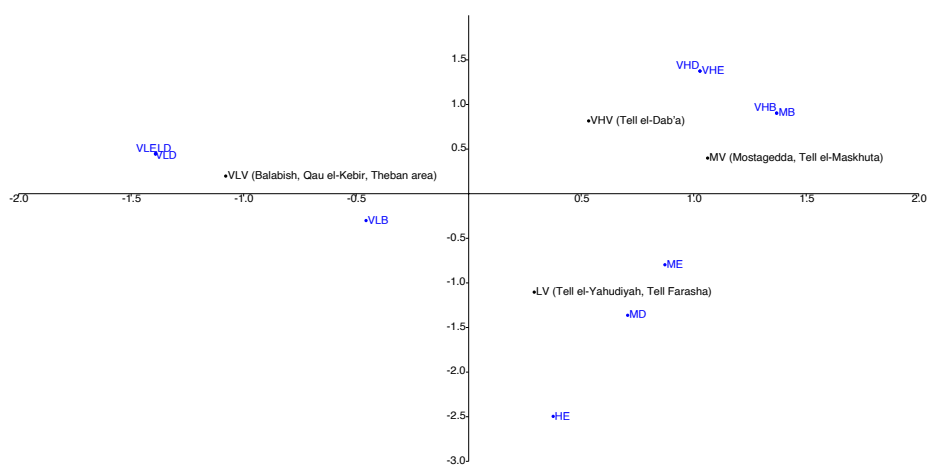


Diagram 20: Correspondence analysis weapons LSIP. First one-mode graph.

The second one-mode graph

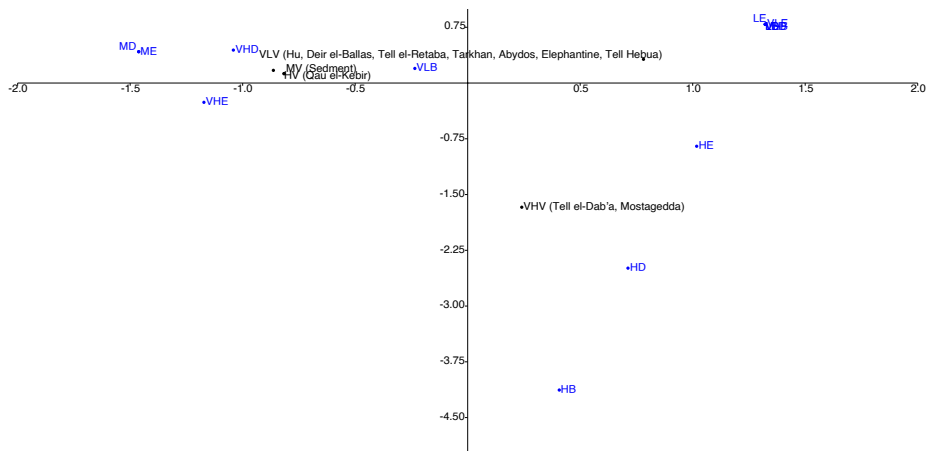


Diagram 21: Correspondence analysis Beads LSIP Second one-mode graph.

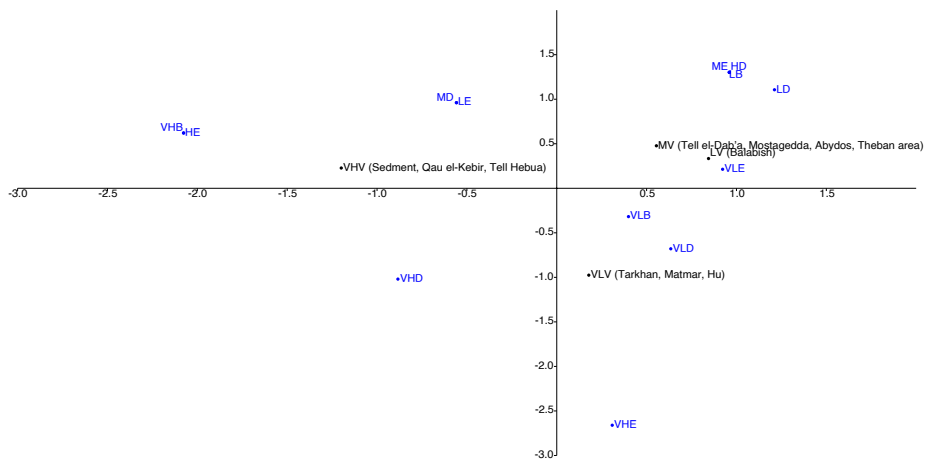


Diagram 22: Correspondence analysis Stone vessels LSIP Second one-mode graph.

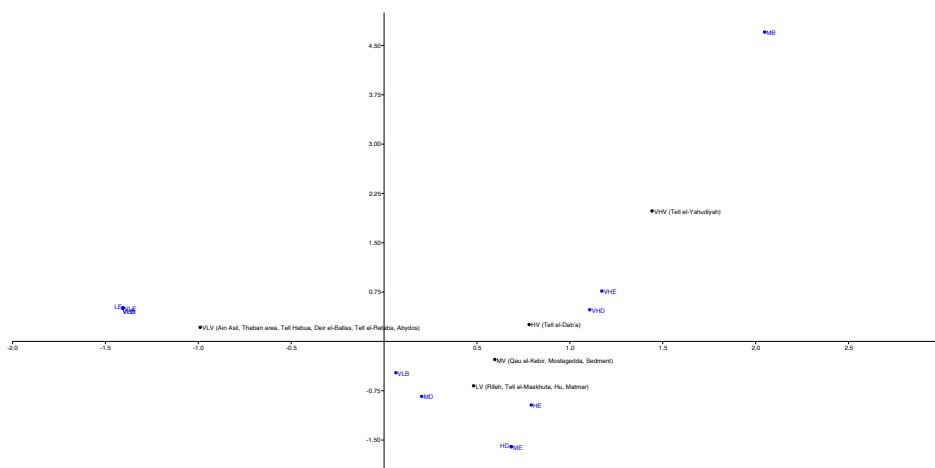


Diagram 23: Correspondence analysis Scarab and seal designs LSIP Second one-mode graph.

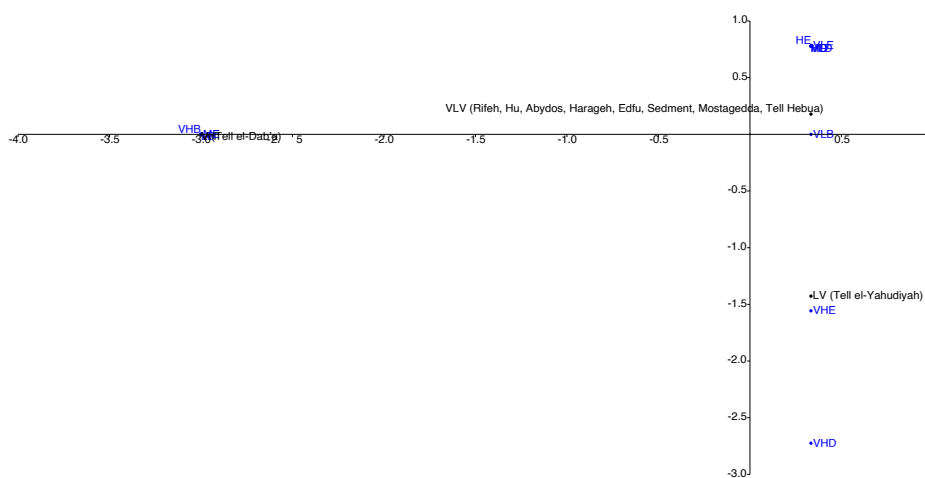


Diagram 24: Correspondence analysis Tell el-Yahudiyah ware LSIP. Second one-mode graph.

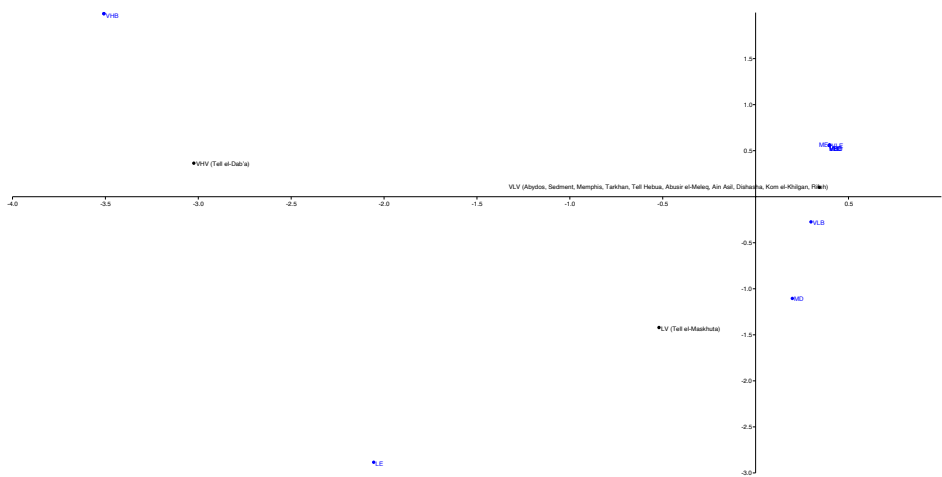


Diagram 25: Correspondence analysis Cypriot pottery LSIP. Second one-mode graph.

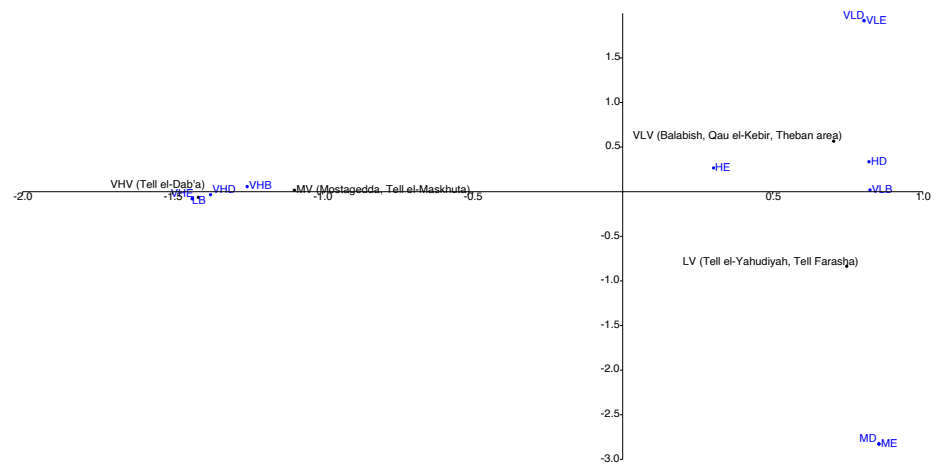


Diagram 26: Correspondence analysis weapons LSIP. Second one-mode graph.

APPENDIX V

SITES AND MATERIALS

This appendix consists of a table (Table 129) showcasing the materials and their findspots in three chronological phases studied as part of this research. The table is very wide and spread across two pages.

Abbreviations are as follows:

- A = LMK
- B = ESIP
- C = LSIP
- AB = LMK + ESIP
- AC = LMK + LSIP
- BC = ESIP + LSIP
- ABC = LMK + ESIP + LSIP

Materials are grouped according to their geographical origin, roughly from north to south, and the sites are likewise organized from north to south.

	Lithic materials from the Sinai		Lithic materials from the central-southern Eastern Desert					Lithic materials from the southern Eastern Desert					
	Turquoise	Rock Crystal	Amethyst	Calcite-alabaster	Diorite	Hematite	Steatite	Ahnydrite	Feldspar	Jasper	Marble	Serpentine	Siltstone
Tell Hebua				C									
Kom el-Khilgan													
Tell el-Dab'a	ABC	ABC	ABC	ABC		B	ABC		C	A		C	C
Tell Farasha													
Tell el-Maskhuta		C	C				C						
Tell el-Retaba			C				C						
Tell el-Yahudiyah			C				C						
Memphis													
Dahshur	A		A	A					A				
Qasr el-Sagha			A	A									
Lisht	A			A			AC		AC	A			
Tarkhan				C									
Riqqeh			A	A					A				
Hawara				A					A				
Abusir el-Meleq													
Lahun	A		A	A			A		A	A			
Harageh	AB		AB	A		A	A		AB	A	A	A	
Sedment			C	C								C	
Dishasha													
Rifeh			A	A						C			
Matmar			AC	AC			AC	A	A				
Mostagedda			AC	AC		C	AC	C	AC	C			
Qau el-Kebir			ABC	ABC		C	AC	AC	C				

(continued)

Lithic materials widespread in Egypt							Imported lithic materials		Metals			Organic materials	
Agate	Basalt	Carnelian	Garnet	Limestone	Quartz	Sedimentary quartzite	Lapis lazuli	Obsidian	Copper	Gold and electrum	Silver	Bone	Shell
	C												
AC		ABC	A	C	ABC	BC	ABC		ABC	ABC	A		
									C				
		C							C	C		C	C
				C					C				
		A					A	A	A	A	A		
C		AC					A	A	A	A			C
		A		A			A			A			
		A								A			
A		A	A	A			A	A	A	A			
	A	AB	A	AB	A	A	AB	A	A	A			
		C	C	C				C		C			C
		A											
		AC	AC	AC	C				A		AC		AC
		AC	C	C	C	A	A		C	C	C	C	AC
		ABC	BC	AC	C		A		ABC	C	BC	B	BC

(continued)

	Lithic materials from the Sinai		Lithic materials from the central-southern Eastern Desert					Lithic materials from the southern Eastern Desert					
	Turquoise	Rock Crystal	Amethyst	Calcite-alabaster	Diorite	Hematite	Steatite	Ahnydrite	Feldspar	Jasper	Marble	Serpentine	Siltstone
Balabish		C		C				C	C				
Abydos			A	ABC			A	AC	A			B	
Denderah			A	A				A					
Ballas			A	A					A				
Deir el-Ballas							C						
Hu			AC	AC						A			
Nubt			A				A			A			A
Theban area		C	AC	AC			AC	C		AC		C	
Armant			A	A	A	A	A		A				
Tod			A	B									
Ain Asil			B	B			BC		A				B
Esna			A	A	A		A	A	A	A			
El-Kab			A			A			A	A			
Edfu			A	AB	A	A		A	AB		A	A	
Elephantine			A							A			

Table 129: Sites and materials during the LMK and SIP.

Lithic materials widespread in Egypt							Imported lithic materials		Metals			Organic materials	
Agate	Basalt	Carnelian	Garnet	Limestone	Quartz	Sedimentary quartzite	Lapis lazuli	Obsidian	Copper	Gold and electrum	Silver	Bone	Shell
		C							C	C			C
		ABC	A				A	A	AB	AB	A	C	A
	A	A	A										
		A											A
		A							AB	A	A	A	C
		AC		A				C	C	C	AC		C
A		A	A		A								
		A										B	B
		AB											
A		A	A	A	A			A	A	A			A
		A					A			A			A
		AB		A					A			A	A
				A									A

APPENDIX VI

CONTEXTS LATE MIDDLE KINGDOM

Explanation of the letters in the table header:

- B = Beads
- SV = Stone vessels
- S&SD = Scarab and seal designs
- TeYW = Tell el-Yahudiyah ware
- CP = Cypriot pottery
- MW = Metal weapons

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
Abydos	Tomb C6			X			
	Tomb D101	X					
	Tomb D104	X	X				
	Tomb D105	X					
	Tomb D109		X				
	Tomb D152	X					
	Tomb D161	X					
	Tomb D162	X					
	Tomb D166	X	X	X			
	Tomb D167	X	X				
	Tomb D176	X					
	Tomb D203	X					
	Tomb D219	X	X				
	Tomb D224	X	X				
	Tomb D234	X	X				
	Tomb D241	X	X				
	Tomb D303	X	X	X			X
	Tomb E1	X	X	X			
	Tomb E20	X		X			
	Tomb E30	X	X	X			

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb E45	X		X			
	Tomb E60	X					
	Tomb E100			X			
	Tomb E105	X	X				
	Tomb E108	X		X			
	Tomb E123			X			
	Tomb E237	X	X				
	Tomb E281		X				
	Tomb E282	X	X				
	Tomb E303			X			
	Tomb E313			X			
	Tomb G6	X					
	Tomb G60	X	X	X			
	Tomb M2	X					
	Tomb µ50	X	X	X			
	Dummy mastaba S8			X			
	Tomb S10		X				
	Tomb 416		X				
	Tomb 817		X				
	Foundation pit in the hosh associated with Senwseret III's cemetery	X					
	Settlement associated with the mortuary complex of Senwosret III: Building A			X			
	Settlement associated with the mortuary complex of Senwosret III: Building C			X			
	Settlement associated with the mortuary complex of Senwosret III: exterior area behind the back doorway of Building A			X			
Armant	Tomb 1213	X	X				
Ballas	Cemetery by the North town	X	X	X			
	Settlement at the North town		X				
Dahshur	Tomb of king Hor Awybra	X	X				
	Tomb of princess Ita	X	X				X
	Tomb of princess Ita-wret		X				
	Tomb of queen Khnemmet-nefer-hedjet Wret	X		X			

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb of princess Khnumit	X	X				
	Tomb of princess Nub-hotep	X	X	X			X
	Treasure of princess Sit-Hathor at the pyramid of Senwosret III	X	X	X			
	Treasure of princess Merit at the pyramid of Senwosret III	X	X	X			
	Tomb of princess Sit-Hathor Merit		X				
	Tomb in the necropolis south of Amenemhat II's necropolis		X				
	Princesses' gallery at the pyramid of Senwosret III		X				
	Tombs 54 in Dahshur North	X	X	X			
	Tomb 79 in Dahshur North	X					
	Tomb 106 in Dahshur North	X					
	Tomb 107 in Dahshur North	X					
	Complex 7					X	
Dakhla	Settlement of Ain Asil, Ensemble Nord, Pièce 9	X					
	Settlement of Ain Asil, Ensemble Centre, Espace 18	X					
Denderah	Tomb 431		X				
	Tomb 488		X				
	Tomb 700	X	X	X			
	Tomb 751			X			
Edfu	Tomb T.V		X				
	Tomb T.VI	X					
	Tomb T.VII	X		X			
	Tomb T.XXVII	X	X				
	Tomb T.XXVIII	X					
	Tomb T.XXXIII						X
	Tomb T.XXXV	X					
	Tomb T.XLI	X					
	Tomb T.XLVII		X				
	Tomb T.XLIX		X				
	Tomb T.LIII		X				
	Tomb NO.XXI	X		X			
	Tomb NO.XXXV		X				

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb NOI.X	X	X				
	Tomb NOI.Xa	X	X				
	Tomb NOI.Xb	X	X	X			
	Tomb NOI.Xc	X					
	Tomb NOI.XVI		X				
	Tomb NOI.XXVIII		X				
	Tomb NOI.XXIX		X				
	Tomb NOI.XXXIII	X	X				
	Tomb NOI.XXXIV		X				
El-Kab	Cemetery of the Twelfth Dynasty	X					
Elephantine	House H70, Bauschicht 13	X					
	House H69a, Bauschicht 13	X	X				
	Deposits in the settlement			X			
Esna	Tomb 37	X					
	Tomb 41		X				
	Tomb 67	X					
	Tomb 85		X				
	Tomb 100	X					
	Tomb 117	X	X				
	Tomb 129	X		X			
	Tomb 133		X	X			
	Tomb 135	X		X			
	Tomb 142		X	X			
	Tomb 153		X	X			
	Tomb 166			X			
	Tomb 169			X			
	Tomb 215			X			
	Tomb 216	X		X			
	Tomb 217			X			
	Tomb 218	X		X			
	Tomb 223	X		X			
	Tomb 224			X			
	Tomb 225		X				
	Tomb 226	X					
	Tomb 230			X			
	Tomb 232			X			
	Tomb 244	X	X	X			

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb 246			X			
	Tomb 249	X		X			
	Tomb 256			X			
	Tomb 261	X					
	Tomb 262	X					
	Tomb 263	X		X			
	Tomb 272	X					
	Tomb 284	X					
	Tomb 287	X					
	Tomb 288	X		X			
	Tomb 290	X					
	Tomb 291			X			
	Tomb 303			X			
	Tomb 305	X		X			
	Tomb 306			X			
	Tomb 307			X			
	Tomb 319	X					
	Tomb 325			X			
	Tomb 336			X			
	Tomb 340		X	X			
	Tomb 345	X					
	Tomb 346	X	X				
	Tomb 355						X
Harageh	Tomb 3	X					
	Tomb 4	X					
	Tomb 7	X					
	Tomb 9	X					
	Tomb 15	X					
	Tomb 16	X					
	Tomb 17	X					
	Tomb 20	X					
	Tomb 23	X					
	Tomb 29		X				
	Tomb 30	X					
	Tomb 32	X					
	Tomb 35	X					
	Tomb 37			X			

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb 38	X					
	Tomb 40	X		X			
	Tomb 45	X					
	Tomb 48	X	X				
	Tomb 49	X					
	Tomb 56	X					
	Tomb 58	X					
	Tomb 59	X					
	Tomb 64	X					
	Tomb 65	X					
	Tomb 66	X					
	Tomb 67	X					
	Tomb 69	X					
	Tomb 70	X					
	Tomb 72	X	X				
	Tomb 74			X			
	Tomb 80	X					
	Tomb 81	X					
	Tomb 82	X					
	Tomb 90	X					
	Tomb 91	X	X	X			
	Tomb 92		X				
	Tomb 93	X					
	Tomb 96	X					
	Tomb 104	X					
	Tomb 106	X					
	Tomb 108	X					
	Tomb 109	X					
	Tomb 110	X					
	Tomb 111		X				
	Tomb 112		X				
	Tomb 116	X		X			
	Tomb 117	X					
	Tomb 118	X					
	Tomb 120	X					
	Tomb 122	X					
	Tomb 124	X	X				X

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb 128	X					
	Tomb 131	X					
	Tomb 132	X					
	Tomb 133	X					
	Tomb 135	X					
	Tomb 138	X					
	Tomb 139	X	X				
	Tomb 140	X					
	Tomb 141	X	X				
	Tomb 142	X					
	Tomb 143	X					
	Tomb 154	X		X			
	Tomb 159	X					
	Tomb 171	X					
	Tomb 187		X				
	Tomb 190	X					
	Tomb 191		X				
	Tomb 211	X					
	Tomb 220	X					
	Tomb 229			X			
	Tomb 235	X					
	Tomb 236	X		X			
	Tomb 244	X		X			
	Tomb 247	X					
	Tomb 248		X				
	Tomb 253			X			
	Tomb 255			X			
	Tomb 256	X					
	Tomb 260	X					
	Tomb 265	X					
	Tomb 271	X					
	Tomb 275		X	X			
	Tomb 276			X			
	Tomb 280	X					
	Tomb 284	X					
	Tomb 285	X					
	Tomb 287			X			

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb 291	X		X			
	Tomb 295			X			
	Tomb 297				X		
	Tomb 306	X		X			
	Tomb 308	X		X			
	Tomb 309		X				
	Tomb 311	X					
	Tomb 312	X					
	Tomb 320	X					
	Tomb 322	X					
	Tomb 324	X	X				
	Tomb 328		X				
	Tomb 336	X	X	X			
	Tomb 339	X					
	Tomb 343	X					
	Tomb 345		X				
	Tomb 348	X					
	Tomb 349	X					
	Tomb 353	X					
	Tomb 354		X	X			
	Tomb 357	X					
	Tomb 359	X					
	Tomb 361		X				
	Tomb 365	X					
	Tomb 371	X					
	Tomb 372	X					
	Tomb 373			X			
	Tomb 374		X				
	Tomb 377	X					
	Tomb 379	X					
	Tomb 380	X					
	Tomb 385	X					
	Tomb 389	X					
	Tomb 391	X					
	Tomb 394	X					
	Tomb 397	X					
	Tomb 399	X					

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb 515	X		X			
	Tomb 516	X					
	Tomb 519			X			
	Tomb 520	X					
	Tomb 521	X					
	Tomb 522	X					
	Tomb 524	X					
	Tomb 525			X			
	Tomb 526	X					
	Tomb 527			X			
	Tomb 528	X					
	Tomb 529	X					
	Tomb 530	X		X			
	Tomb 531	X					
	Tomb 533	X	X				
	Tomb 534	X					
	Tomb 547	X					
	Tomb 549			X			
	Tomb 551	X					
	Tomb 555	X					
	Tomb 583	X					
	Tomb 586			X			
	Tomb 600	X					
	Tomb 602	X	X				
	Tomb 603	X					
	Tomb 605	X					
	Tomb 608	X					
	Tomb 612	X					
	Tomb 613	X		X			
	Tomb 614	X					
	Tomb 620	X					
	Tomb 621	X					
	Tomb 622	X					
	Tomb 623	X					
	Tomb 625	X	X				
	Tomb 626		X				
	Tomb 628	X	X				

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb 647			X			
	Tomb 660	X					
	Tomb 661	X	X				
	Tomb 803	X					
	Tomb 804	X					
Hawara	House 350				X		
	Offering chamber in the pyramid of Neferwptah	X					
	Burial chamber in the pyramid of Neferwptah		X				
	Sepulchre in the pyramid of Amenemhat III		X				
	Tombs north of the pyramid of Amenemhat III	X					
Hu	Tomb W15		X				
	Tomb W32	X	X	X			
	Tomb W38	X	X				
	Tomb W49		X				
	Tomb W65			X			X
	Tomb W72		X				
	Tomb W84						X
	Tomb W85		X				
	Tomb W161		X				
	Tomb Y1		X				
	Tomb Y4		X				
	Tomb Y5		X				
	Tomb Y15	X					
	Tomb Y24		X				
	Tomb Y34	X	X				
	Tomb Y35		X				
	Tomb Y51	X	X	X			
	Tomb Y66		X	X			
	Tomb Y75		X				
	Tomb Y83		X				
	Tomb Y91		X	X			
	Tomb Y152		X				
	Tomb Y160		X				
	Tomb Y162						X

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb Y165						X
	Tomb Y173		X				
	Tomb Y174						X
	Tomb Y175		X				
	Tomb Y176						X
	Tomb Y179						X
	Tomb Y194		X				
	Tomb Y196		X				
	Tomb Y218		X				
	Tomb Y245		X				
	Tomb Y261		X				
	Tomb Y269		X				
	Tomb Y296		X				
	Tomb Y301		X				
	Tomb Y305		X				
	Tomb Y311		X				
	Tomb Y314		X				
	Tomb Y316		X				
	Tomb Y318		X				
	Tomb Y331		X				
	Tomb Y338		X				
	Tomb Y341		X				
	Tomb Y348		X				
	Tomb Y349		X				
	Tomb Y352		X				
	Tomb Y359		X				
	Tomb Y361		X				
	Tomb Y372		X				
	Tomb Y405		X				
	Tomb Y412						X
	Tomb Y424			X			
	Tomb Y426		X	X			
	Tomb Y448		X				
	Tomb Y456		X				
	Tomb Y458		X				
	Tomb Y461		X				
	Tomb Y469		X				

Site	Contexts	B	SV	S&SD	TeYW	CP	MW
	Tomb Y490		X				
	Tomb Y497		X				
	Tomb Y499		X				
	Tomb Y502		X				
	Tomb Y507		X				
	Tomb Y508		X				
	Tomb Y510		X				
	Tomb Y513		X				
	Tomb Y514		X				
	Tomb Y517		X				
	Tomb Y525		X				
	Tomb Y842		X				
	Tomb Y910		X				
	Tomb Y911		X				
Lahun	Tomb N 17	X					
	Tomb 2	X					
	Tomb 103	X					
	Tomb 134	X					
	Tomb 138	X					
	Tomb 142	X					
	Tomb 330						X
	Tomb 601	X					
	Tomb 606	X					
	Tomb 608		X				
	Tomb 620	X					
	Tomb 621		X				
	Tomb 650	X					
	Tomb 653			X			
	Tomb 903	X		X			
	Tomb 905	X					
	Tomb 906	X					
	Tomb 907	X					
	Tomb 914	X					
	Tomb 916	X					
	Tomb 7 in the pyramid precinct of Senwosret II	X					
	Tomb 8 in the pyramid precinct of Senwosret II	X					

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
Lisht	Tomb 9 in the pyramid precinct of Senwosret II	X					
	Tomb 10 in the pyramid precinct of Senwosret II	X					
	Tomb of Sit-Hathor Yunet in the pyramid complex of Senwosret II	X	X	X			
	Offering chamber in Senwosret II's pyramid	X					
	Foundation deposit in the temple area	X					X
	Settlement area	X	X	X	X		X
	Easternmost southern large house in the settlement area					X	
	Group 9, from a house in the settlement area		X				X
	Tomb 453			X			
	Tomb 756	X					
	Tomb 758			X			
	Tomb 879	X	X		X		
	Tomb 954			X			
	Pit 381				X		
	Pit 405			X			
	Pit 907				X		
	Pit 951			X			
	Tomb of Senwosretankh at the pyramid of Senwosret I				X		
	Tomb of epy at the pyramid of Senwosret I	X	X				
	Mastaba pit of Sehetepibreankh at the pyramid of Senwosret I	X					
Matmar	Cemetery in Lisht North			X			
	Cemetery in Lisht South			X			
	Tomb 400	X	X				
	Tomb 476			X			
	Tomb 478	X					
	Tomb 482		X				
	Tomb 491	X					
	Tomb 496			X			
	Tomb 500		X				

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb 505	X		X			
	Tomb 507			X			
	Tomb 511			X			
	Tomb 518	X	X				
	Tomb 520	X					
	Tomb 521	X					
	Tomb 527	X					
	Tomb 535	X	X				
	Tomb 544	X					
	Tomb 574			X			
	Area 300	X					
Memphis	Settlement area of Kom Rabi'a				X		
Mostagedda	Tomb 724	X	X	X			
	Tomb 726			X			
	Tomb 733	X	X				
	Tomb 740			X			
	Tomb 756		X				
	Tomb 1007	X					
	Tomb 1100	X					
	Tomb 1101	X	X				
	Tomb 1719	X					
	Tomb 1900	X					
	Tomb 1901			X			
	Tomb 10108			X			
	Tomb 10111			X			
	Tomb 10112			X			
	Tomb 10114	X					
	Tomb 10400			X			
Nubt	Settlement			X			
Qasr el-Sagha	Unit B IV		X				
	Unit D I		X		X		
	Unit D II		X	X	X		
	Courtyard C I		X				
	By the temple		X				
Qau el-Kebir	Tomb 409	X					
	Tomb 452	X					
	Tomb 500	X					
	Tomb 523			X			

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb 700	X					
	Tomb 701		X				
	Tomb 734	X		X			
	Tomb 818	X	X				
	Tomb 1207	X		X			
	Tomb 1219	X					
	Tomb 1405	X					
	Tomb 1415		X	X			
	Tomb 3200			X			
	Tomb 3800		X				
	Tomb 4900		X				
	Tomb 4967	X					
	Tomb 4969	X					
	Tomb 4977	X	X				
	Tomb 4978	X					
	Tomb 4983			X			
	Tomb 4993	X					
	Tomb 4998			X			
	Tomb 4999	X					
	Tomb 5001			X			
	Tomb 5003	X		X			
	Tomb 5008	X	X				
	Tomb 5218	X		X			
	Tomb 5239	X					
	Tomb 5250			X			
	Tomb 5259	X					
	Tomb 7026		X				
	Tomb 7043		X				
	Tomb 7120		X				
	Tomb 7129		X				
	Tomb 7136		X				
	Tomb 7154		X				
	Tomb 7182	X					
	Tomb 7191	X		X			
	Tomb 7417			X			
	Tomb 7489						X
	Tomb 7606			X			
	Tomb 7611			X			

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
Rifeh	Tomb 7885	X		X			
	Tombs of the Twelfth Dynasty	X					
	Tomb 24		X				
	Tomb 34		X				
	Tomb 39		X				
	Tomb 66		X				
	Tomb 67		X				
	Tomb 70		X				
	Tomb 89		X				
	Tomb 92		X				
	Tomb 116		X				
	Tomb 118		X				
	Tomb 120		X				
	Tomb 134		X				
	Tomb 156		X				
	Tomb 194		X				
	Tomb 214		X				
	Tomb 215		X				
	Tomb 221		X				
	Tomb 226		X				
	Tomb 227		X				
	Tomb 229		X				
	Tomb 230		X				
	Tomb 235		X				
	Tomb 237		X				
	Tomb 243		X				
	Tomb 250		X				
	Tomb 252		X				
	Tomb 253		X				
	Tomb 257		X				
Riqqeh	Tomb H83		X				
	Tomb H114		X				
	Tomb 7	X					
	Tomb 14	X					
	Tomb 16			X			
	Tomb 17		X				
	Tomb 27	X					

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb 34		X				
	Tomb 46		X				
	Tomb 52b	X					
	Tomb 57			X			
	Tomb 73a	X					
	Tomb 96a	X					
	Tomb 106			X			
	Tomb 116		X				
	Tomb 117		X				
	Tomb 118a	X					
	Tomb 135a	X					
	Tomb 143		X				
	Tomb 144		X				
	Tomb 146a	X					
	Tomb 150		X				
	Tomb 153		X				
	Tomb 155a	X					
	Tomb 156		X				
	Tomb 160a	X					
	Tomb 176		X				
	Tomb 179a	X					
	Tomb 180		X				
	Tomb 188a	X					
	Tomb 210	X					
	Tomb 231	X					
	Tomb 235			X			
	Tomb 236			X			
	Tomb 240	X					
	Tomb 241		X				
	Tomb 432			X			
	Tomb 506			X			
	Tomb 510		X				
	Tomb 516a	X					
Tell el-Dab'a	A/II-i/22 Tomb 31			X			
	A/II-l/12 Tomb 4			X			
	A/II-m/11 Tomb 6				X		
	A/II-m/15 Tomb 9						X

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	A/II-m/15 Tomb 11	X		X			
	A/II-n/12 Tomb 4	X	X				
	A/II-r/18 Tomb 2		X				
	F/I-i/21 Tomb 26			X			
	F/I-i/21 Tomb 34				X		X
	F/I-i/21 Tomb 37			X			
	F/I-i/22 Tomb 30				X		
	F/I-i/22 Tomb 31			X			X
	F/I-i/22 Tomb 33				X		
	F/I-i/22 Tomb 34				X		
	F/I-i/22 Tomb 35			X			
	F/I-i/22 Tomb 39			X			
	F/I-j/23 Tomb 13			X			
	F/I-k/22 Tomb 7				X		
	F/I-k/22 Tomb 26			X			
	F/I-k/22 Tomb 32			X			
	F/I-l/19 Tomb 1				X		
	F/I-l/19 Tomb 4			X			
	F/I-l/21 Tomb 35			X			
	F/I-m/17 Tomb 2						X
	F/I-m/17 Tomb 5						X
	F/I-m/18 Tomb 3	X	X	X			X
	F/I-m/18 Tomb 12	X					
	F/I-m/19 Tomb 11				X		
	F/I-m/19 Tomb 25					X	
	F/I-n/18 Tomb 2		X	X			
	F/I-n/21 Tomb 1	X					
	F/I-n/21 Tomb 10						X
	F/I-o/17 Tomb 1						X
	F/I-o/19 Tomb 8						X
	F/I-o/19 Tomb 13	X					
	F/I-o/20 Tomb 11	X		X			
	F/I-o/20 Tomb 17						X
	F/I-o/21 Tomb 6						X
	F/I-p/17 Tomb 14	X					X
	F/I-p/18 Tomb 14						X
	F/I-p/19 Tomb 12				X		

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	A/II-m/11 Pl. 6				X		
	A/II-m/15 Pl. 5				X		
	A/II-p/16					X	
	A/IV-g/6 Pl. 1-2 K4249					X	
	A/IV-h/4 Pl. 0-1					X	
	A/IV-h/5 Pl. 2-3					X	
	A/IV-h/6 Pl. 1-3 K4004					X	
	A/IV-h/6 Pl. 2-3					X	
	A/IV-j/5 Pl. 4						X
	F/I-i/21 Pl. 3-4				X		
	F/I-i/22 Pl. 5				X		
	F/I-j/22 Pl. 6-7				X		
	F/I-j/23 Pl. 3-4					X	
	F/I-i/23 Pl. 5				X		
	F/I-j/23n Pl. 3-4				X		
	F/I-k/19				X		
	F/I-k/20 Pl. 2-3				X		
	F/I-l/23 Pl. 4-5				X		
	F/I-m/19 Pl. 0-1				X		
	F/I-p/19 Pl. 0-1					X	
	F/I-p/20 Granary 11				X		
Theban area	Tomb R.H""1			X			
	East of Sacred lake in Karnak			X			
	Tomb 1102 in Assassif			X			
	Tomb MR 35 at Sheik Abd el-Gurna	X		X			
	Tomb 823 at Sheik Abd el-Gurna				X		
Tod	West of the chapel	X					
	Temple, floor level between walls B and C	X					

APPENDIX VII

CONTEXTS EARLY SECOND INTERM. PERIOD

Explanation of the letters in the table header:

- B = Beads
- SV = Stone vessels
- S&SI = Scarab and seal designs
- TeYW = Tell el-Yahudiyah ware
- CP = Cypriot pottery
- MW = Metal weapons

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SI</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
Abydos	Tomb B13		X	X	X		
	Tomb D90			X			
	Tomb D110						X
	Tomb E3	X	X	X			
	Tomb E102			X			
	Tomb E145	X					
	Tomb E156						X
	Tomb E230	X		X			X
	Tomb E243						X
	Tomb E300			X			
Dakhla	Settlement of Ain Asil, Ensemble Centre, Pièce 17		X				
	Settlement of Ain Asil, Ensemble Centre, Pièce 19	X	X				
	Settlement of Ain Asil, Ensemble Centre, Pièce 23	X					
	Settlement of Ain Asil, Ensemble Centre, Pièce 24	X					
	Settlement of Ain Asil, Ensemble Nord, Pièce 6	X	X	X			
	Settlement of Ain Asil, Ensemble Nord, Pièce 21	X					

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
Edfu	Settlement of Ain Asil, Ensemble Nord, Pièce 25		X				
	Settlement of Ain Asil, Ensemble Nord, Espace 21			X			
	Tomb NO.XVI	X					
	Tomb NO.XXIII		X				
	Tomb NO.XXXIII		X				
Harageh	Tomb 38	X					
	Tomb 105	X					
	Tomb 162	X					
	Tomb 326	X					
	Tomb 330	X					
	Tomb 358	X					
	Tomb 396	X					
	Tomb 612	X					
	Tomb 620	X					
	Tomb 644	X					
Hu	Tomb Y237						X
	Tomb E.2 at Abadiyeh						X
Memphis	Settlement of Kom Rabi'a, phase VI				X		
Qau el-Kebir	Tomb 1300	X					
	Tomb 1300/2	X					
	Tomb 1300/3	X					
	Tomb 1300/4	X					
	Tomb 1300/5	X					
	Tomb 1300/6	X					
	Tomb 1300/7	X					
	Tomb 1300/8	X					
	Tomb 1300/9	X					
	Tomb 1300/10	X					
	Tomb 1300/11	X					
	Tomb 1300/12	X					
	Tomb 1300/13	X					
	Tomb 1300/14	X					
	Tomb 1300/15	X					
	Tomb 1301	X					
	Tomb 1304	X					

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb 1305	X					
	Tomb 1306	X					
	Tomb 5463	X					
	Tomb 5464	X					
	Tomb 5465	X					
	Tomb 5466	X					
	Tomb 5467	X					
	Tomb 5468	X					
	Tomb 5469	X					
	Tomb 5470	X					
	Tomb 5471	X					
	Tomb 5472	X					
	Tomb 5473	X					
	Tomb 5475	X					
	Tomb 5478	X					
	Tomb 5480	X					
	Tomb 5481	X					
	Tomb 5482	X					
	Tomb 7152		X				
	Tomb 7402	X					
	Tomb 7413	X		X			
	Tomb 7443	X					
	Tomb 7451	X					
	Tomb 7458	X					
	Tomb 7478	X					
	Tomb 7494	X					X
	Tomb 7498						X
Tell el-Dab'a	A/II-l/11 Tomb 2		X				
	A/II-l/11 Tomb 3			X			
	A/II-l/12 Tomb 5			X			X
	A/II-l/14 Tomb 7			X	X		X
	A/II-l/16 Tomb 4			X			X
	A/II-m/10 Tomb 8	X			X		X
	A/II-m/10 Tomb 9			X			
	A/II-m/13 Tomb 13	X			X		
	A/II-m/15 Tomb 8	X	X	X	X		
	A/II-m/15 Tomb 12		X				

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	A/II-m/16 Tomb 3	X	X	X	X		
	A/II-n/13 Tomb 8			X	X		
	A/II-p/14 Tomb 8						X
	A/II-p/14 Tomb 10				X		
	A/II-p/14 Tomb 12				X		
	A/II-p/14 Tomb 13	X			X		
	A/II-p/14 Tomb 18			X			
	A/II-p/14 Tomb 19	X					
	A/II-p/21 Tomb 11			X			
	A/II-r/18 Tomb 1	X		X			
	A/II-k/17 Tomb 30	X	X	X	X		
	A/II-l/14 Pl. 4-5				X		
	A/II-l/17 Pl. 4-5					X	
	A/II-l/17 Pl. 6				X		
	A/II-m/10 Pl. 4-5					X	
	A/II-n/15 Pl. 3/4 K386					X	
	A/II-n/17 Pl. 2-3					X	
	A/II-o/15-16					X	
	A/II-o/18				X		
	A/II-p/21 Pl. 4-5 K2371					X	
	A/IV-h/4 Tomb 11				X		
	A/IV-h/6 Tomb 13				X		
	A/IV-h/6 Pit 14				X		
	A/IV-h/7 Tomb 4				X		
	A/IV-h/7 Tomb 7				X		
	A/IV-g/4 Pl. 1 K4215					X	
	A/IV-g/6 Pl. 1-2 K4249					X	
	A/IV-h/4 Pl. 1					X	
	A/IV-h/4 Pl. 1-2					X	
	A/IV-h/4 Pit 7					X	
	A/IV-h/5 Pl. 3 K4003					X	
	A/IV-j/4 Pl. 1					X	
	A/IV-j/4 Pl. 1-2					X	
	A/IV-j/5 Pl. 2-3					X	
	A/IV-j/5 Pl. 3					X	
	F/I-i/20 Tomb 3				X		
	F/I-i/23 Tomb 26				X		

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
Tod	F/I-i/23 Tomb 32				X		
	F/I-j/20 Tomb 10				X		
	F/I-j/22 Tomb 2			X	X		
	F/I-j/22 Tomb 26			X			
	F/I-k/20 Tomb 1				X		
	F/I-k/20 Tomb 1A			X			
	F/I-k/20 Tomb 4				X		
	F/I-k/20 Tomb 9 or 10						X
	F/I-k/20 Tomb 10			X			
	F/I-k/20 Tomb 13				X		
	F/I-k/21 Tomb 15				X		
	F/I-k/24 Tomb 42				X		
	F/I-l/20 Tomb 20						X
	F/I-l/20 Tomb 31				X		
	F/I-l/22 Tomb 31			X			
	F/I-n/21 Tomb 3				X		
	F/I-o/21 Tomb 5				X		
	F/I-o/21 Tomb 12			X			
	F/I-p/20 Tomb 5						X
	F/I-p/20 Tomb 13				X		
	F/I-j/21 Pl. 0-1				X		
	F/I-j/23N Pl. 1						X
	F/I-k/21 Pl. 1-2					X	
	F/I-k/23 Pl. 0-1				X		
	F/I-m/22 Schnitt 17				X		
	F/II-k/28 Locus 1711		X				
	F/II-J/26N Locus 1421					X	
	R/II-B2 Tomb L448	X	X				
	Tomb 2	X					
	Tomb 3	X					
	Tomb 6		X				
	Tomb 7	X	X				

APPENDIX VIII

CONTEXTS LATE SECOND INTERM. PERIOD

Explanation of the letters in the table header:

- B = Beads
- SV = Stone vessels
- S&SI = Scarab and seal designs
- TeYW = Tell el-Yahudiyah ware
- CP = Cypriot pottery
- MW = Metal weapons

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SI</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
Abusir el-Meleq	Tomb 48					X	
Abydos	Tomb D11				X		
	Tomb D21				X		
	Tomb D71			X			
	Tomb D93	X					
	Tomb D94		X				
	Tomb E10				X	X	
	Tomb E257			X			
	Tomb W2	X					
	Tomb W3	X	X				
	Tomb W5	X	X				
	Tomb W6	X					
	Tomb W11	X	X				
	Tomb W15	X					
	Tomb X52		X			X	
Balabish	Tomb B27	X					
	Tomb B96	X					
	Tomb B98	X					
	Tomb B110	X					

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
Dakhla	Tomb B150	X					
	Tomb B153	X					
	Tomb B162	X					
	Tomb B176	X					
	Tomb B178	X					
	Tomb B181	X					
	Tomb B182	X					
	Tomb B183	X					
	Tomb B195	X					
	Tomb B201	X	X				X
	Tomb B207		X				
	Tomb B208		X				
	Tomb B210	X					
	Tomb B212	X					
	Tomb B213	X					
	Tomb B219	X	X				
	Tomb B220	X					
	Tomb B221	X					
	Tomb B222	X					
	Tomb B225	X					
	Tomb B226	X	X				X
	Tomb B227	X					
	Tomb B228	X					
	Tomb B230						X
	Tomb B231	X					
	Tomb B232		X				
	Tomb B234	X					
	Tomb B235	X					
	Tomb B236	X					
	Tomb B239	X					
	Tomb B241	X					
	Tomb B242	X					
	Settlement of Ain Asil, Ensemble Centre, Pièce 10			X			
	Settlement of Ain Asil, Ensemble Centre, Pièce 19			X			
	Settlement of Ain Asil, Ensemble Centre, Northern entry			X			

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Settlement of Ain Asil, phase 4					X	
Deir el-Ballas	House E	X		X			
Dishasha	Tomb 44					X	
Edfu	Unspecified context				X		
Elephantine	House H99, Bauschicht II	X					
Harageh	Tomb 354				X		
	Deposits between cemeteries				X		
Hu	Cemetery X	X					
	Tomb X36		X				
	Tomb X74		X				
	Tomb Y204				X		
	Tomb Y207				X		
	Tomb Y274			X			
	Tomb Y317			X			
	Tomb Y438			X			
	Tomb Y441			X			
	Tomb Y479			X			
	Tomb Y488			X			
	Tomb Y492			X			
	Cemetery YS	X					
Kom el-Khilgan	Settlement					X	
Lisht	Tombs excavated by the Metropolitan Museum of Arts, New York	X					
Matmar	Tomb 5002	X	X	X			
	Tomb 5004		X	X			
	Tomb 5005			X			
	Tomb 5006	X		X			
	Tomb 5010	X	X	X			
	Tomb 5011	X		X			
	Tomb 5020	X	X				
	Tomb 5021	X					
	Tomb 5022	X					
	Tomb 5307	X					
	Area 5000	X		X			
Memphis	Settlement of Kom Rabi'a					X	
Mostagedda	Tomb 128			X			
	Tomb 240			X			

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb 400			X			
	Tomb 409			X			
	Tomb 418	X		X			
	Tomb 722			X			
	Tomb 1671			X			
	Tomb 1700			X			
	Tomb 1705			X			
	Tomb 1718			X			
	Tomb 1800			X			
	Tomb 1807			X			
	Tomb 1811			X			
	Tomb 1821	X	X	X			
	Tomb 1830			X			
	Tomb 1834	X		X			
	Tomb 1861			X			
	Tomb 1871			X			
	Tomb 1874	X	X	X			
	Tomb 1914			X			
	Tomb 1953			X			
	Tomb 2630			X			
	Tomb 3100		X				
	Tomb 3103	X					
	Tomb 3104	X					
	Tomb 3105	X					
	Tomb 3106	X					
	Tomb 3108	X					
	Tomb 3110	X					
	Tomb 3111	X					
	Tomb 3112	X					
	Tomb 3113	X					
	Tomb 3114	X					
	Tomb 3115	X					
	Tomb 3116	X					
	Tomb 3117	X					
	Tomb 3118	X					
	Tomb 3119	X					
	Tomb 3120	X					

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb 3121	X	X				X
	Tomb 3122	X					
	Tomb 3123	X	X				X
	Tomb 3124	X					
	Tomb 3125	X					
	Tomb 3127	X					
	Tomb 3128	X					X
	Tomb 3129	X					
	Tomb 3130	X					
	Tomb 3131	X					
	Tomb 3132	X					X
	Tomb 3134	X					
	Tomb 3135	X					
	Tomb 3136	X		X			
	Tomb 3137	X					
	Tomb 3138	X					X
	Tomb 3139	X					
	Tomb 3141	X					
	Tomb 3142	X					
	Tomb 3143	X					
	Tomb 3144	X					
	Tomb 3145	X					
	Tomb 3146	X			X		
	Tomb 3148	X					
	Tomb 3150	X					
	Tomb 3151	X	X				
	Tomb 3152	X					
	Tomb 3153	X	X				
	Tomb 3154	X					
	Tomb 3155	X					
	Tomb 3159	X	X				
	Tomb 3160	X					
	Tomb 3161	X					X
	Tomb 3163	X					
	Tomb 3170	X		X			X
	Tomb 3171	X	X				
	Tomb 3203		X	X			

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb 3208	X					
	Tomb 3211	X					
	Tomb 3212	X		X			
	Tomb 3214	X		X			
	Tomb 3215	X					
	Tomb 3217		X				
	Tomb 3218	X					
	Tomb 3220	X					
	Tomb 3223	X					
	Tomb 3224	X		X			
	Tomb 3225	X					
	Tomb 3226	X					
	Tomb 3227	X					
	Tomb 3228	X	X				
	Tomb 3229	X					X
	Tomb 3230	X					
	Tomb 3231	X					
	Tomb 3232	X					
	Tomb 3233	X					
	Tomb 3234	X	X	X			
	Tomb 3237	X					
	Tomb 3238	X					
	Tomb 3240	X					
	Tomb 3241	X					
	Tomb 3242	X	X				
	Tomb 3243	X	X	X			
	Tomb 3245	X					
	Tomb 3246	X		X			
	Tomb 3248	X					
	Tomb 3248a	X					
	Tomb 3251	X					
	Tomb 3252	X					
	Tomb 3253	X					
	Tomb 3254	X					
	Tomb 3258	X					
	Tomb 3270	X					
	Tomb 3271	X					

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb 3311	X					
	Tomb 5211		X				
	Tomb 5214		X				
	Tomb 10101	X					
	Tomb 10116	X					X
Qau el-Kebir	Tomb 10212		X				
	Tomb 11716			X			
	Tomb 11800			X			
	Tomb 420		X				
	Tomb 1301	X					
	Tomb 1303	X					
	Tomb 1305	X					
	Tomb 1306	X					
	Tomb 1989	X					
	Tomb 3712	X		X			
	Tomb 3763			X			
	Tomb 3921		X				
	Tomb 4506	X					
	Tomb 4508	X					
	Tomb 4511	X					
	Tomb 4521	X					
	Tomb 4523	X					
	Tomb 4988	X					
	Tomb 5460	X					
	Tomb 5462	X					X
	Tomb 5503			X			
	Tomb 7045		X	X			
	Tomb 7101		X				
	Tomb 7121		X	X			
	Tomb 7129			X			
	Tomb 7132	X	X				
	Tomb 7152		X				
	Tomb 7163	X	X				X
	Tomb 7192	X					
	Tomb 7254			X			
	Tomb 7402		X				
	Tomb 7427		X				

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb 7430	X					
	Tomb 7442		X				
	Tomb 7475		X				
	Tomb 7482		X				
	Tomb 7486		X				
	Tomb 7492	X		X			
	Tomb 7494		X				
	Tomb 7496	X		X			
	Tomb 7578		X				
	Tomb 7669			X			
	Tomb 7700			X			
Rifeh	Tomb 31			X			
	Tomb 58				X		
	Tomb 66				X		
	Tomb 67			X			
	Tomb 73				X		
	Tomb 111			X			
	Tomb 120			X			
	Tomb 134			X			
	Tomb 152			X			
	Tomb 158			X		X	
	Tomb 164			X			
	Tomb 176			X			
	Tomb 226			X			
	Tomb 325			X			
	Tomb 500			X			
	Tomb H.49			X			
	Tomb H.92			X			
	Unspecified tombs			X	X		
Sedment	Tomb K1201			X			
	Tomb K1202			X			
	Tomb K1212	X					
	Tomb K1213	X					
	Tomb K1222	X					
	Tomb K1223	X					
	Tomb K1226			X			
	Tomb K1230	X					

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb K1231			X			
	Tomb K1250	X					
	Tomb K1253			X			
	Tomb K1256	X		X			
	Tomb K1257	X					
	Tomb K1258	X					
	Tomb K1261	X					
	Tomb K1262	X	X	X			
	Tomb K1264	X					
	Tomb K1265	X	X	X			
	Tomb K1268	X					
	Tomb K1270	X	X	X			
	Tomb K1271	X					
	Tomb K1272	X					
	Tomb K1273	X	X	X			
	Tomb K1276	X					
	Tomb K1277	X					
	Tomb K1278	X	X				
	Tomb K1279				X		
	Tomb K1281	X					
	Tomb K1282	X					
	Tomb K1283	X					
	Tomb K1284	X					
	Tomb K1288	X	X	X			
	Tomb K1289					X	
	Tomb K1290			X			
	Tomb K1291	X					
	Tomb K1292	X					
	Tomb K1293	X					
	Tomb K1294	X					
	Tomb K1295			X			
	Tomb K1297	X					
	Tomb K1298	X					
	Tomb K1299	X		X			
	Tomb K1300	X	X	X			
	Tomb K1301			X			
	Tomb K1315			X		X	

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
Tarkhan	Tomb K1324			X			
	Tomb K1326					X	
	Tomb 821					X	
	Tomb 1895	X	X			X	
Tell el-Dab'a	A/I-g/3 Tomb 1			X	X		X
	A/I-g/4 Tomb 3						X
	A/I-g/3 Pl. 3				X		
	A/I-g/4 Pl. 1				X		
	A/I-g/4 Pl. 2				X	X	
	A/I-g/4 Pl. 3				X		
	A/I-g/5 Pl. 3			X			
	A/I-f/6 Pl. 1-2			X			
	Area A/I Pit 496 in Bezirk I	X					
	A/II-k/9 Tomb 35	X					
	A/II-k/11 Tomb 1			X			
	A/II-k/14 Tomb 1	X	X	X	X		X
	A/II-k/14 Tomb 8	X		X	X		
	A/II-k/16 Tomb 20		X				
	A/II-k/16 Tomb 24			X			
	A/II-k/17 Tomb 13			X			
	A/II-k/17 Tomb 30				X		
	A/II-l/12 Tomb 1	X	X	X	X		
	A/II-l/12 Tomb 2	X			X		X
	A/II-l/12 Tomb 3				X		
	A/II-l/12 Tomb 5				X		
	A/II-l/13 Tomb 2				X		
	A/II-l/14 Tomb 4	X			X		
	A/II-l/14 Tomb 5	X		X	X		X
	A/II-l/14 Tomb 12	X					
	A/II-l/14/15 Tomb 2	X		X			
	A/II-l/15 Tomb 1				X		
	A/II-l/15 Tomb 2			X			
	A/II-l/16 Tomb 1				X		
	A/II-l/16 Tomb 2				X		X
	A/II-l/17 Tomb 2				X		
	A/II-l/17 Tomb 3				X		
	A/II-l/17 Tomb 5					X	

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	A/II-l/17 Tomb 13			X			X
	A/II-m/10 Tomb 6	X		X			
	A/II-m/11 Tomb 1			X		X	
	A/II-m/11 Tomb 3	X					
	A/II-m/11 Tomb 5	X			X		
	A/II-m/11 Tomb 6			X	X		
	A/II-m/11 Tomb 7				X	X	
	A/II-m/11 Tomb 11	X		X			
	A/II-m/11 Tomb 13				X		
	A/II-m/12 Tomb 9				X		
	A/II-m/12 Tomb 10				X		
	A/II-m/12 Tomb 12	X					
	A/II-m/13 Tomb 2	X	X	X			
	A/II-m/13 Tomb 3				X		
	A/II-m/13 Tomb 4		X		X		
	A/II-m/13 Tomb 6			X			
	A/II-m/13 Tomb 14				X		
	A/II-m/15 Tomb 1	X		X			
	A/II-m/15 Tomb 2	X					
	A/II-m/15 Tomb 3	X		X	X		
	A/II-m/17 Tomb 1		X				
	A/II-m/17 Tomb 2				X		
	A/II-m/17 Tomb 3			X	X		
	A/II-m/17 Tomb 6				X		
	A/II-m/18 Tomb 1	X					
	A/II-n/10 Tomb 1				X	X	
	A/II-n/10 Tomb 2	X					
	A/II-n/10 Tomb 3	X		X			
	A/II-n/10 Tomb 4			X			
	A/II-n/10 Tomb 5				X		
	A/II-n/11 Tomb 3				X		
	A/II-n/11 Tomb 4	X					X
	A/II-n/11 Tomb 5				X		
	A/II-n/11 Tomb 11				X		
	A/II-n/12 Tomb 7				X		
	A/II-n/13 Tomb 2	X					
	A/II-n/13 Tomb 4	X			X		

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	A/II-n/13 Tomb 5	X			X		
	A/II-n/14 Tomb 1				X		
	A/II-n/15 Tomb 1	X	X	X			X
	A/II-n/19 Tomb 4				X		
	A/II-n/19 Tomb 5				X		X
	A/II-o/12 Tomb 3				X		
	A/II-o/12 Tomb 8				X		
	A/II-o/14 Tomb 3	X		X	X		
	A/II-o/14 Tomb 7	X					
	A/II-o/14 Tomb 43	X		X	X		
	A/II-o/14 Tomb 46	X					
	A/II-o/20 Tomb 4			X			X
	A/II-o/21 Tomb 1				X		
	A/II-o/21 Tomb 4			X	X		
	A/II-p/13 Tomb 3				X		
	A/II-p/13 Tomb 4				X		X
	A/II-p/13 Tomb 15						X
	A/II-p/14 Tomb 2				X		
	A/II-p/14 Tomb 4	X			X		
	A/II-p/14 Tomb 13				X		
	A/II-p/20 Tomb 2			X			X
	A/II-p/20 Tomb 3			X	X	X	X
	A/II-p/20 Tomb 4				X		
	A/II-p/21 Tomb 1				X		
	A/II-p/21 Tomb 3				X		
	A/II-p/21 Tomb 4				X		
	A/II-p/21 Tomb 7						X
	A/II-p/21 Tomb 15			X	X		
	A/II-p/22 Tomb 1			X			
	A/II-q/20 Tomb 1			X			
	A/II-q/21 Tomb 1				X		
	A/II-s/18 Tomb 1				X		
	A/II-a/21 K656					X	
	A/II-e/24 Pl. o-1				X		
	A/II-i/11 Pl. 2 K3751					X	
	A/II-i/11 Pl. 6				X	X	
	A/II-i/11 Pl. 6 Oven 1					X	

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	A/II-i/II Pl. 6-7				X	X	
	A/II-k/9 Pl. 7					X	
	A/II-k/9 Pl. 8-9				X	X	
	A/II-k/II-l/II					X	
	A/II-k/I4 Pl. 1-2			X			
	A/II-k/I5 Pl. 1 K3223					X	
	A/II-k/I5 Pl. 2 Pit 5A				X		
	A/II-k/I6 Pl. 2					X	
	A/II-k/I6 Pl. 2-3					X	
	A/II-k/I6 Pl. 4				X		
	A/II-k/I7 Pl. 1-2					X	
	A/II-k/I7 Pl. 2-3					X	
	A/II-k/I7 Pl. 3					X	
	A/II-l/I0 Pl. 1-2				X		
	A/II-l/II Pl.2-3 K3776					X	
	A/II-l/I2 Pl. 0/I					X	
	A/II-l/I2 Pl. 2-3				X		
	A/II-l/I3 Pl. 1			X			
	A/II-l/I4 Pl. 2-3				X		
	A/II-l/I4 Pl. 3					X	
	A/II-l/I7 Pl. 1-2				X		
	A/II-l/I7 Pl. 4				X		
	A/II-m/I0 Pl. 3				X		
	A/II-m/I0 Pl. 3-4			X			
	A/II-m/II Pl. 1					X	
	A/II-m/II Pl. 4				X		
	A/II-mI2/I3			X			
	A/II-m/I3 Pl. 3					X	
	A/II-m/I3 Pl. 3-4			X	X		
	A/II-m/I3 oven				X		
	A/II-m/I4 Pl. 1-2					X	
	A/II-m/I5 Pl. 2-3			X			
	A/II-m/I8 Pl. 1-2				X		
	A/II-m/I8 Pl. 2-3					X	
	A/II-n/I0 Pl. 2, in House 533						X
	A/II-n/II Pl. 1					X	

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	A/II-n/12 Pl. 1/2, in Courtyard 497						X
	A/II-n/12 Pl. 2				X	X	
	A/II-n/12 Pl. 3/4, in House 379						X
	A/II-n14 Pl. 1-2				X		
	A/II-n/15 Pl. 1					X	
	A/II-n/18 Pl. 4-5 K1177					X	
	A/II-n/19 Pl. 2-3				X	X	
	A/II-o/12 Pl. 2			X			
	A/II-o/12 Pl. 2-3				X		
	A/II-o/12 Pl. 4-5 Pit					X	
	A/II-o/13 Pl. 2/3						X
	A/II-o/13, in Room 449	X					
	A/II-o/15 Pl. o/1					X	
	A/II-o/21 Pl. 2				X		
	A/II-o/21 Pl. 7				X		
	A/II-o/21 Offering pit 8				X		
	A/II-p/13 Pl. 3				X		
	A/II-p/13 Profile				X		
	A/II- q/21 Pl. 1					X	
	Area A/II, Temple I	X			X		
	Area A/II, House 533	X					
	A/III Pl. 2-3				X		
	A/IV-g/4 Tomb 1						X
	A/V-m/18 Tomb 12				X		
	A/V-m/18 Tomb 20			X			
	A/V-o/18 Tomb 1			X			
	A/V-p/19 Tomb 7					X	
	A/V-p/19 Tomb 28				X		
	A/V-p/19 Tomb 33				X		
	A/V-m/17 Pl. 1-2				X		
	A/V-m/18 Pl. 1-2				X		
	A/V-m/19 Pl. 1-2			X			
	A/V-m/19 Pl. 2-3			X			
	A/V-m/n/18 Pl. o/1			X			
	A/V-n/17 Pl. 1			X			
	A/V-n/17 Pl. 1-2			X	X	X	

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	A/V-n/17 Pl. 2 in room					X	
	A/V-n/18 Pl. 1-2 K 3447/4					X	
	A/V-o/18 Pl. 1-2				X	X	
	A/V-o/18 Pl. 2				X		
	A/V-p/16 Pl. 1-2					X	
	A/V-p/16 Pl. 2			X			
	A/V-p/17 Pl. o/1-2 K3442					X	
	A/V-p/17 Pl. 1-2					X	
	A/V-p/17 Pl. 2			X	X		
	A/V-p/18 Pl. 1-2				X		
	A/V-p/18 Pl. 2				X	X	
	A/V-p/18 Pl. 3					X	
	A/V-p/19 K3449/1-5					X	
	A/V-p/19 Pl. 2				X		
	A/V-p/19 Pl. 4			X		X	
	A/V-p/19 Pl. 4-5				X	X	
	A/V-p/19 Pl. 5-6					X	
	A/V-p/19 Pl. 6				X	X	
	A/V-p/19 Pl. 7				X	X	
	A/V-q/16 Pl. o-1				X		
	A/V-q/17 Pl. 1				X		
	A/V-q/19 Pl. 1-2			X			
	A/V-q/19 Pl. 2				X		
	Area A/V Building 005-007	X					
	Area A/V, Alley in Bezirk IV	X					
	Area A/V Hut 013-015	X					
	Area A/V House 092-093	X					
	Area A/V, Courtyard 114 in Bezirk III	X					
	Area A/V, Cattle storage	X					
	Area A/V, Storage area		X				
	Area A/V, Rubbish heap in Bezirk IV	X					
	F/I-i/22 Tomb 1				X		
	F/I-i/22 Tomb 4				X		
	F/I-i/22 Tomb 7				X		
	F/I-i/23 Tomb 11				X		
	F/I-j/23 Tomb 7				X		

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	F/I-l/23 Tomb 32				X		
	F/I-l/23 Tomb 6				X		
	F/I-m/19 Tomb 7				X		
	F/I-o/21 Tomb 6				X		
	F/I-i/21 Pl. 1-2					X	
	F/I-i/22 Offering pit 12				X		
	F/I-i/23 Pl. o-1				X		
	F/I-j/21 Pl. 1				X	X	
	F/I-j/21 Pl. 1 Pit 1					X	
	F/I-j/22 Pl. 1				X		
	F/I-k/21 Pl. o-1				X		
	F/I-k/22s Pl. o-1				X		
	F/I-k/23 Pl. 1 K2729					X	
	F/I-k/24 Pl. o-1				X		
	F/I-k/24 Pit 2				X		
	F/I-l/23 Pl. 1				X		
	F/I-m/19 Pit 5				X		
	F/I-o/21 Offering pit 9					X	
	F/I-p/21 Pit 3				X		
	F/I-q/24 Pl. 1				X		
	F/II-r/22-23 Deposit L81	X			X	X	
	Area F/II, Deposit L557	X					
	H/III-p/18 Pl. 6 Locus 66				X		
	H/III-q/19 Pl. 3-4				X		
	H/III-q/19 Pl. 4-5				X		
	Area H/III, Eastern part of the citadel					X	
	H/VI-u/13 Pl. 12				X		
	H/VI-x/20 Pl. 6				X		
	Area R/III (Complex 1, Complex 2, Complex 3, Street 1, Street 2)	X	X				
	West of 'Eznet Mehesin K4000, Trench 13					X	
Tell el-Maskhuta	Tomb H6.6026	X		X			
	Tomb L2.2016						X
	Tomb L2.2029						X
	Tomb L2.2178			X			

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb L12.12312	X		X			
	Tomb L12.12317			X			
	Tomb L12.12321			X			X
	Tomb L12.12508	X					
	Tomb L12.12736	X		X			
	Tomb R1.1026	X		X			
	Tomb R1.1138	X		X			
	Tomb R2.2054			X			
	Tomb R8.8079			X			X
	Settlement	X		X		X	
	Unspecified tombs					X	
Tell el-Retaba	Tomb 810	X		X			
Tell el-Yahudiya	Tomb 1			X			X
	Tomb 2			X	X		
	Tomb 3			X	X		
	Tomb 4			X	X		
	Tomb 5			X			X
	Tomb 6			X	X		
	Tomb 16				X		
	Tomb 28			X			
	Tomb 19			X			
	Tomb 37			X	X		
	Tomb 407			X	X		X
	Unspecified tombs			X	X		
	Settlement area			X	X		
Tell Farasha	Tomb 5						X
	Tomb 16						X
Tell Hebua	Zone B/1	X	X			X	
	Zone B/2	X	X	X	X	X	
	Zone B/3			X			
	Zone B/91	X	X				
Theban area	Tomb with Rishi coffin at Sheik Abd el-Gurna	X	X	X			X
	Tomb of Senmut at Sheik Abd el-Gurna		X				
	Tomb of Soberest at Dra' Abu el-Naga'			X			
	Tomb of 'Akhon at Dra' Abu el-Naga'			X			

<i>Site</i>	<i>Contexts</i>	<i>B</i>	<i>SV</i>	<i>S&SD</i>	<i>TeYW</i>	<i>CP</i>	<i>MW</i>
	Tomb of Neferhotep at Dra' Abu el-Naga		X	X			
	Coffin of King Kamose at Dra' Abu el-Naga						X
	Tombs in the area between Assasif and Dra' Abu el-Naga	X					
	Courtyard of tomb CC41 at Assasif			X			
	Tomb CC64 at Assasif			X			

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ENGLISH SUMMARY

This PhD dissertation examines the relationships between sites in Egypt during the Second Intermediate Period (ca. 1750 and 1550 BC). This period was characterized by political divisions and by regionalized material culture, as well as by the presence of groups from modern-day Syria-Palestine and Nubia that managed to acquire considerable power and play an important role in Egyptian society.

The Second Intermediate Period is also characterized by the scarcity of written documents. As a result, there is still much debate about the political situation during this period and about the succession of kings and dynasties. Following a discussion of the relevant literature and discussions about this subject, as well as about the absolute dates, I have chosen the following chronological framework (chapter 2). I consider the Second Intermediate Period to begin with the rise of the Fourteenth Dynasty in Lower Egypt, in the second half of the Thirteenth Dynasty (ca. 1775 BC). I divide the Second Intermediate Period in the Early Second Intermediate Period, up to the end of the Fourteenth Dynasty, and in the Late Second Intermediate Period, after the end of the Fourteenth Dynasty and until the rise of the Eighteenth Dynasty (ca. 1550 BC). I have not considered the rise of the Fifteenth Dynasty, because the new finds from Edfu cast doubts about when it should be dated and make it not a reliable chronological criterion for the beginning of the Late Second Intermediate Period. On the contrary, I consider the rise of the different dynasties in Upper Egypt – i.e. the Sixteenth and the Seventeenth Dynasty, as well as the Abydos Dynasty (whose existence is accepted here) – the main criterion to determine the start of the Late Second Intermediate Period. The rise of these dynasties indicates, in my opinion, the emergence of new political powers that possibly caused changes in the material culture, having an impact on the regionalization process. The present work also includes an analysis of the material culture of the Late Middle Kingdom, meaning the Twelfth Dynasty after the reign of Senwosret III and the Thirteenth Dynasty until the reign of Merneferra Ay (who is the last king to be attested both in Lower and Upper Egypt). This is done because this period includes already has features that

characterize the Second Intermediate Period. This also helps to better understand the onset of the Second Intermediate Period and the change it involved.

The aim of the present work is to study the regionalization processes and the relationships between the different areas and sites in a period of political turmoil in Egypt, through a systematic study of the material culture. As discussed in Chapter 3, I define a region as an area whose sites are usually geographically close each other and share similar developments in the material culture during the period under consideration. I consider a group of sites to be part of the same region if the strata dated to the Second Intermediate Period contain objects with a similar style, distinguishable from the styles of the Middle Kingdom and of the New Kingdom, and if the style of the New Kingdom appears in archaeological strata whose dating is contemporary. I define style as the shapes, surface decorations and treatments, and techniques that characterize objects in a specific space and period. Concerning the Second Intermediate Period, the matter of regionalization has been examined in earlier scholarship mostly through the study of pottery. Six possible regions have thus been identified: the Eastern Delta, the Memphis-Fayyum area, Middle Egypt, the area around Thebes, Elephantine, and the oasis in the Western Desert (the oasis of Kharga, Dakhla, and Bahariya). In the present work, the focus is on small finds: beads, stone vessels, metal weapons, scarabs and seals. Two types of pottery, the Tell el-Yahudiyah pottery and the Cypriot pottery, have been included in the analysis, because they shed light on relationships with communities from the Eastern Mediterranean and on their possible presence in Egypt.

Regarding the latter aspect, Chapter 4 emphasizes that ethnicity is difficult to get a handle on using archaeology. Firstly, as in the debate on the later phenomenon of “Romanization”, there is the risk of focusing too much on a simplistic binary opposition between “Egyptian” and “non-Egyptian”, where non-Egyptian includes Asiatics, Nubians and Cypriots. Secondly, there is the risk of simplifying interactions as merely acculturation and assimilation: these attribute only a passive role to non-Egyptian communities, and they ignore more complex and nuanced processes of cultural interaction. Moreover, not all objects new to Egyptian traditions carried ethnic meaning: the imported objects, or their imitations, and the regionalization processes, may have had other reasons, including economic and political ones. All in all, Egypt was part of a connected world. For all these reasons, I regard the assemblages of objects not as signifiers of ethnic groups, but of entire networked systems, of smaller or larger scale, which include political, religious, social, and cultural groups as well. My focus is on how the objects circulated and which relationships they indicate, and how the objects originating outside Egypt took part in networks of contact and exchange. Instead of disentangling ethnicities,

I explore how material culture was used at a local level and how places and objects were interconnected.

To understand the relationships between sites during the SIP and the regionalization processes, this research focuses on the types of objects that the sites have in common. A type is defined as an object of specific shape and specific material. The central assumption is that the closer the contacts were between two or more sites, the more similar the material culture became. As a consequence, sites where similar objects have been excavated had close contacts and were probably part of the same region. To achieve this, the methods of network analysis have been applied, which are discussed in Chapter 5. Network analysis enables us to analyse the relationships, and the circulation of objects, or ideas, or fashions, or knowledge between several entities on the basis of what they have – or do not have – in common. This analysis is conducted using digital tools, which allow us both to elaborate graphs, which visualize the relationships and the networks, and to calculate mathematical expression, which examine the role(s) of each entity in the network. In the present dissertation, the entities examined are the sites, and their relationships are detected on the basis of the types of objects that they have in common. The data were collected from archaeological material already published, although two major problems have been encountered. Firstly, the archaeological contexts considered for the study can be disturbed by past activities, or can be difficult to date. Secondly, the contexts studied do not form the complete sample, but only what has been excavated and published so far; therefore, the dataset is a partial one and data are lacking. As a consequence, there is the risk of archaeological bias, namely over-representing or under-representing sites based on the available data. To tackle these issues, only contexts with secure dates have been included in the analysis, and only the presence/absence of objects at the sites has been considered, without counting the amount of contexts where the objects have been found.

The last introductory chapter, Chapter 6, deals with the materials used to produce the objects examined in the present dissertation. I focus on their physical and chemical characteristics, on the location of their source in Egypt, or from where they were imported into Egypt, and on their traditional nomenclature in Egyptology and in the present work. In particular, what are traditionally referred to as schist and blue marble, in the present dissertation are respectively referred to as siltstone and anhydrite, while calcite-alabaster is used in the present work to indicate what is traditionally called alabaster in Egyptology.

The first chapter dedicated to the analysis of objects is Chapter 7, which deals with the beads. During the Late Middle Kingdom, the major players in the circulation of beads appear to be sites in Middle and Upper Egypt, and

especially the sites in the Memphis-Fayyum area. This means that the beads could be made and shipped from there, or destined to these places, and also new trends could start from there. This is not surprising, considering that most resources come from the central and southern Egyptian Eastern Desert and that the capital was located in the Memphis-Fayyum area. Dakhla Oasis, Deir el-Ballas, Tod, and Tell el-Dab'a appear to be possible passageways or (re)distribution centres in the circulation of beads. During the Early Second Intermediate Period, Tell el-Dab'a, Harageh, Qau el-Kebir, and Dakhla Oasis appear to be the major players on the circulation of beads. There appear to be connections between Tell el-Dab'a, Middle Egypt and Abydos, while the contacts with the southern part of Upper Egypt would pass both through Harageh, Dakhla Oasis, and Abydos. At the same time, Edfu and Tod look like passageways or (re)distribution centres in the network of beads, probably because the materials used for beads come mostly from the Eastern Desert in Upper Egypt, therefore they could be channelled through these sites. Given that part of the material that connects the sites during this period is found in tombs ascribed to the Nubian or Pan-grave culture, it is possible that these groups had a role in the circulation of the beads. During the Late Second Intermediate Period, Tell el-Dab'a, Sedment, Mostagedda, Qau el-Kebir, and the Theban area look like the major players in the circulation of beads. Tell Hebua seem to have been a passageway or (re)distribution centre in the network of beads. Tell el-Maskhuta, Lisht, Matmar, Balabish, Abydos, and Hu seem have in common a great part of their material culture with other sites, but this part included the more common types only in a minor quantity. Tell el-Dab'a was in contact mostly with the sites in Middle Egypt and Sedment. Also the Theban area seems to be in contact with the sites in Middle Egypt, as well as with Tell el-Dab'a. All in all, the contacts between Lower and the southern part of Upper Egypt appear to pass both through the desert and through Middle Egypt and Abydos.

The stone vessels are analysed in Chapter 8. The results show that during the Late Middle Kingdom, Harageh, Rifeh, Abydos, Hu, Esna, and Edfu were major sites in the circulation of stone vessels. Dahshur, Riqqeh, Hawara, Lahun, Qasr el-Sagha, and Ballas have many types in common, but these do not include the most common types. Again, the sites that seem to have a role in the circulation of stone vessels are in the Memphis-Fayyum area and in Upper Egypt. Matmar, Qau el-Kebir, and Denderah appear to be passageways or (re)distribution centres in the network of stone vessels; this suggests that the circulation of vessels was passing through those sites on its way to and from the Memphis-Fayyum area. During the Early Second Intermediate Period, the stronger connections in the network of stone vessels are between Tell el-Dab'a and Edfu, while the latter is also connected to Abydos and, through

this, to Tod. All in all, Tell el-Dab'a, Edfu, and Abydos appear to have a major role in the circulation of stone vessels. During the Late Second Intermediate Period, the sites in Lower Egypt appear to be in contact with the sites in the southern part of Upper Egypt mostly through the sites in Middle Egypt. The sites of Tell Hebua, Sedment, Mostagedda, and Qau el-Kebir were major sites in the circulation of stone vessels; Tell Hebua had also the role of an intermediary. Hu and Matmar have a great part of their types of stone vessels in common with other sites, but this part did not include the more common types.

In Chapter 9, the impressions from scarabs and seals are examined. The results demonstrate that during the Late Middle Kingdom, the sites of Lisht, Lahun, Harageh, Esna, Nubt, Elephantine had a main role in the circulation of the designs. This circulation appears to rely mostly on sites in the Memphis-Fayyum area and the southern part of Upper Egypt. Therefore, these were the sites where the designs used on scarab and seal designs, hence the objects themselves, could be produced and sent from, or sent to. Perhaps this is because Lisht, Lahun, and Harageh were in the area of the capital in that period, and that Elephantine was an important position to enter Nubia. Edfu and Ballas look like passageways or (re)distribution centres in the same network. During the Early Second Intermediate Period, Tell el-Dab'a and Abydos are the only two sites connected through the scarab and seal designs, while Dakhla Oasis and Qau el-Kebir appear isolated in this network. This could suggest a more localized circulation of scarab and seal designs. During the Late Second Intermediate Period, Tell el-Dab'a, Tell el-Yahudiyah, and Sedment appear to play a role in the circulation of scarab and seal designs. Tell el-Maskhuta, Rifeh, and Mostagedda have a great part of their types of designs in common with other sites, but this part did not include the more common types. Abydos seem to be a site where the designs, or even the objects themselves, were channelled through. All in all, during this period contacts were mostly between the sites in the Delta and the ones in Middle Egypt, while contacts between Lower and the southern part of Upper Egypt passed, mostly, by Sedment, Abydos and, in a lesser way, Dakhla Oasis.

Chapter 10 is dedicated to the analysis of the Tell el-Yahudiyah ware. The results indicate that, during the Late Middle Kingdom, the sites of Lahun, Lisht and, possibly, Harageh were the places where the Tell el-Yahudiyah ware was mostly circulating. This is not surprising, because the sites are mostly located in the Memphis-Fayyum area, the area of the capital during the period. Tell el-Dab'a played a role of a passageway or (re)distribution centre in the circulation of the Tell el-Yahudiyah ware. All in all, the circulation of this ware during this period involves mostly sites in Lower and Egypt and the Memphis-Fayyum area. During the Early Second Intermediate Period, the only connections detected through the network of the Tell el-Yahudiyah ware

are between Tell el-Dab'a and respectively Memphis and Abydos. During the Late Second Intermediate Period, the sites of Tell el-Yahudiyah and, possibly, Harageh, Rifeh, and Abydos appear to be the sites where the Tell el-Yahudiyah ware was sent to or from. All in all, the circulation of this ware seems to involve mostly sites in Lower and Middle Egypt. Again, Tell el-Dab'a seem to be the place where the Tell el-Yahudiyah ware would be channelled through.

Chapter 11 examines the Cypriot pottery. Before the Late Second Intermediate Period, it includes nearly only imported vessels. Tell el-Dab'a appear to be the main, or even only Egyptian site in contact with Cyprus. However, Cypriot pottery does not create further links between Tell el-Dab'a and the other Egyptian sites. Only few specimens during the Late Middle Kingdom are found outside Tell el-Dab'a, and only in the area of the capital of the time, namely the Memphis-Fayyum area. During the Late Second Intermediate Period, Tell el-Dab'a, and probably also Tell el-Maskhuta, Sedment, Tarkhan, and Abydos played a special role in the circulation of Cypriot pottery, which focuses, all in all, on the Nile Delta and the Memphis-Fayyum area. All in all, the analysis of Cypriot pottery still shows strong contacts between Tell el-Dab'a and Cyprus, and weak connections between Tell el-Dab'a and the other Egyptian sites.

The last chapter dedicated to the analysis of objects is Chapter 12, on metal weapons. The results show that, during the Late Middle Kingdom, the sites of Tell el-Dab'a, Lahun, and Hu had a special role in the circulation of the weapons. Two groups have been detected, of which one formed by Tell el-Dab'a, Esna, and Lisht, and one formed by Hu, Qau el-Kebir, and Lahun. This could reflect communities with two different social practices, even though, given the small number of objects, further analysis before taking this conclusion further. During the Early Second Intermediate Period, only Tell el-Dab'a and Hu are connected, through only one type of knife. During the Late Second Intermediate Period, two groups have been identified again. The first of these groups involves the sites in Lower Egypt and focuses on Tell el-Maskhuta, Tell el-Dab'a and Tell el-Yahudiyah, which are known to have a similar material culture in common, influenced by features traditionally associated with Syria-Palestine. The second group involves the sites in Middle Egypt, especially where communities of the Pan-grave culture are attested, and focuses on Mostagedda, Qau el-Kebir, and Balabish. The mentioned sites appear to play a special role in the circulation of metal weapons. The Theban area has no connections to other sites, thus appear to be a third, separate cluster. Considering that weapons come mostly from graves, where they were deposited as burial equipment, the situation described could derive from different burial customs.

After examining the objects, the distribution of the materials is studied in Chapter 13. It appears that during the Late Middle Kingdom, lithic ma-

terials were widely distributed and transported also far from their sources. However, especially when concerning the precious and imported stones, they were channelled through the Memphis-Fayyum area, where they were probably transported as raw materials and worked into finished objects in the royal workshops in the area. The very widespread stones usually show a more localized production. Among metals, only gold appear to have been worked in royal workshops in the Memphis-Fayyum area, probably because of its preciousness, while silver, which likely was imported and entered Egypt through Tell el-Dab'a, and copper objects were mostly produced according to local traditions. Lastly, bone and shell, especially as far as beads are concerned, suggest that Middle and Upper Egypt followed different traditions. During the Early Second Intermediate Period, the variety of lithic materials decreased, and these materials appear to circulate mostly between Lower and Middle Egypt. The Memphis-Fayyum area was still included in the distribution of the precious stones and of the stones entering Egypt through Tell el-Dab'a. When the materials could be found in both the central and southern parts of the Egyptian Eastern Desert, the sources in the central part appear to have been the ones more used, while the resources from the southern part were acquired only when available in proximity of the Wadi Hammamat and the Wadi Barramiya. Materials from the southernmost parts of the Egyptian Eastern Desert were transported to Lower Egypt, through routes passing both through the oases in the Western Desert and through the sites in Middle Egypt. The communities of Pan-grave culture probably played a role in the communications between different areas of Egypt, as suggested by the importance that the sites occupied by these group acquired, and by the materials found at these sites. Silver, together with bone and shell objects, seem to be indicator of these communities of Pan-grave culture and of the significance that they had at the time. Stones coming from further south Egypt have not been found in contexts of this time: this could derive from the fact that there were no sites with the resources required to do so at the time. The distribution of the types, combined with the distribution of materials, suggests that the lithic materials were worked locally or, in the case of materials that could be found also in the central part of the Egyptian Eastern Desert, at Tell el-Dab'a. At the same time, metal objects show a mostly localized production. During the Late Second Intermediate Period, lithic materials still seem to circulate more commonly between Lower and Middle Egypt, though contacts happened between Lower and the southern part of Upper Egypt. The Memphis-Fayyum area was relevant especially as access point to the desert routes through the Western Desert, which were used at the time for communications between Lower and Upper Egypt. The materials from the southern Egyptian Eastern Desert seem to have been shipped as raw material and be worked locally, even though they

circulated more than in the previous period and were acquired from deeper into the desert. The stones from the Sinai and the stones imported from the Levant were present only at Tell el-Dab'a. As suggested by its distribution, rock crystal could come from its sources in the Western Desert, and not in Sinai, at the time. Stones that could be imported into Egypt from further south still reached the Memphis-Fayyum area. Among metals, gold show connections between Lower and Upper Egypt, while copper and silver show a more marked regionalization. Through the objects of copper, Lower Egypt, Middle Egypt, and the Theban area are identified as three separate groups, while objects of silver appear to be connected to sites where Pan-grave culture are attested, in the same way as bone beads were.

Finally, Chapter 14 presents the conclusions of the present research. During the Late Middle Kingdom, the activity of a centralized administration located in the capital area in the Memphis-Fayyum area is still visible. This administration controlled the circulation of materials and was also a key production and distribution centre for the main types of objects, especially as far as objects of precious materials are concerned. These objects were transported both through the Nile Valley and through the Western Desert. The material culture was generally uniform, even though differences are visible in groups of objects that suggest the presence of or contacts with foreign communities. During the Early Second Intermediate Period, Tell el-Dab'a became important because it had reached independence under the Fourteenth Dynasty and, as a consequence, became able to acquire material resources and to produce and distribute the more common types of objects. Trade and exchanges continued between Lower Egypt and the Memphis-Fayyum area, as well as with Upper Egypt, mostly through the desert route. Communities of the Pan-grave culture became more important and played a role concerning the trade routes and the routes leading to the material resources. During the Late Second Intermediate Period, Tell el-Dab'a, under Hyksos rule, was an important site and had influence on the other sites in the Eastern Delta, as well as on the flow of goods between Egypt and the Levant. The use of the desert routes is shown by the sites in the Memphis-Fayyum area, which had close contacts with the Hyksos. Nevertheless, sites in Middle Egypt such as Qau el-Kebir and Mostagedda, which had strong connections with both Lower and the southern part of Upper Egypt, show not only that people travelled through the Nile Valley, but also that communities of the Pan-Grave culture were still significant in the communication and trade system. The communities buried at Matmar and Rifeh were also part of the routes between Lower and Upper Egypt, but were respectively under influence of the Hyksos and of other communities of Pan-grave culture such as the ones represented at Qau el-Kebir and Mostagedda. In Upper Egypt, the Theban area, which was probably the

centre of the kingdoms of the Sixteenth and of the Seventeenth Dynasty, was a major site, while the communities represented at Hu and Abydos bridged Lower and Upper Egypt and channelled the resources from the Eastern Desert. The community buried at Hu had close contacts with main communities of Pan-grave culture such as the ones represented at Qau el-Kebir and Mostagedda. It also had contacts with the Theban rulers and demonstrates the importance of the desert routes, to which it was a point of access. Abydos had connections with the Hyksos, probably because it was at the frontier of the Theban kingdom and was, therefore, a meeting and melting point for people and goods from both the Hyksos and the Theban Kingdom. Nevertheless, the results could also indicate that it was ruled by the Hyksos at the beginning of the Late Second Intermediate Period. Lastly, Elephantine could also be a separate territory, and even in closer contacts with Nubia than with the rest of Egypt, but the data are too few to take this hypothesis further.

DUTCH SUMMARY

De titel van dit proefschrift kan vertaald worden als *Meer dan mensen en potten: identiteit en regionalisering in het oude Egypte gedurende de Tweede Tussenperiode, ca. 1775-1550 v.Chr.* In dit werk staan de relaties tussen plaatsen in het oude Egypte tijdens de Tweede Tussenperiode (ca. 1775 en 1550 v.Chr.) centraal. Deze periode werd gekenmerkt door politieke verdeeldheid en door een ge-regionaliseerde materiële cultuur. Daarnaast woonden er in Egypte toen ook mensen uit Syrië-Palestina en Nubië, die een aanzienlijke macht wisten te verwerven en een belangrijke rol speelden in de Egyptische samenleving.

De Tweede Tussenperiode wordt ook gekenmerkt door een schaarste aan teksten. Hierdoor is er nog veel onduidelijk wat de politieke situatie in deze periode betreft, waaronder de opvolging van koningen en dynastieën. In hoofdstuk 2 ga ik nader in op de chronologische problemen en welke keuzes ik heb gemaakt wat periodisering betreft. Voor mijn onderzoek verdeel ik de Tweede Tussenperiode in tweeën: een vroeg deel (tot en met het einde van de 14e Dynastie) en een laat deel (tot het begin van de 18e Dynastie, ca. 1550 v.Chr.).

Dit proefschrift draait om regionalisering en contact tussen verschillende gebieden en plaatsen, waarbij het onderzoek voornamelijk bestaat uit een systematische studie van de materiële cultuur. Zoals besproken in hoofdstuk 3, definieer ik een regio als een gebied waarvan afzonderlijke locaties meestal dicht bij elkaar liggen en die qua materiële cultuur vergelijkbare ontwikkelingen kennen binnen een specifiek tijdvak. Ik definieer stijl als de vormen, versieringen, en technieken die kenmerkend zijn voor objecten uit een specifieke geografische gebied en voor een specifiek tijdvak. Onderzoek naar regionalisering in de Tweede Tussenperiode is tot nu toe voornamelijk verricht aan de hand van aardewerkstudies. Maar in het huidige werk ligt de nadruk op kleine vondsten: kralen, stenen vaatwerk, wapens, en afdrukken van scarabeeën en zegels. Daarnaast zijn ook twee verschillende soorten kenmerkend aardewerk opgenomen, omdat ze eventueel licht werpen op relaties tussen Egypte en het oostelijk deel van het Middellandse Zeegebied: Tell el-Yahudiyah aardewerk en Cypriotische aardewerk.

In hoofdstuk 4 bespreek ik etniciteit en hoe het moeilijk is om grip hierop te krijgen aan de hand van archeologische bronnen. Men loopt het risico om te veel een simplistische binaire tegenstelling te creëren tussen Egyptenaren

en niet-Egyptenaren, waarbij verschillende volkeren zoals Aziaten en Nubi-ers, onder één noemer worden geschaard. Daarnaast dreigen complexe interacties tussen verschillende groepen te worden gereduceerd tot simpelweg acculturatie en assimilaties, waarbij enkel een passieve rol lijkt weggelegd voor niet-Egyptenaren. De werkelijkheid was natuurlijk complexer. Vandaar dat ik objecten in deze studie niet beschouw als duiders van etniciteit, maar als bewijs voor het bestaan van een ingewikkeld netwerk en systemen van contact en uitwisseling tussen verschillende politieke, sociale en culturele groepen. Mijn onderzoek richt zich dan ook op hoe de objecten circuleerden en welke relaties ze mogelijk aangeven. Ik richt me dus op hoe de materiële cultuur werd gebruikt op lokaal niveau en hoe sites en objecten met elkaar waren verbonden.

Om de relaties tussen sites ten tijde van de Tweede Tussenperiod te begrijpen, richt ik me in dit onderzoek op de objecten die verschillende sites met elkaar gemeen hebben. Een 'type' wordt gedefinieerd als een object met een specifieke vorm en gemaakt van een specifiek materiaal. De centrale veronderstelling is dat hoe nauwer de contacten tussen twee of meer sites waren, hoe meer de materiële cultuur hetzelfde is. Als gevolg hiervan hadden sites waar soortgelijke objecten zijn opgegraven, waarschijnlijk dus onderling nauwe contacten en maakten ze mogelijk deel uit van dezelfde regio. Ik heb hiervoor gebruik gemaakt van netwerkanalyse – network analysis – dat in hoofdstuk 5 nader wordt besproken. Netwerk analyse stelt ons om relaties te analyseren, en de circulatie van objecten of ideeën (enz.) tussen verschillende entiteiten op basis van wat ze wel of niet met elkaar gemeen hebben. Deze analyse wordt uitgevoerd met behulp van applicaties waarmee de relaties kunnen worden gevisualiseerd in grafieken. In dit proefschrift vormen sites de bestudeerde entiteiten en de relaties tussen sites worden bekeken aan de hand van de objecten (typen) die ze met elkaar gemeen hebben. De gegevens zijn verzameld uit eerdere publicaties over archeologisch materiaal. Hierbij kunnen twee problemen worden geconstateerd. Ten eerste kunnen de archeologische contexten die voor het onderzoek in aanmerking worden genomen, worden verstoord door activiteiten in het verleden; soms zijn ze überhaupt moeilijk te dateren. Ten tweede bieden de bestudeerde contexten geen totaalbeeld, maar geven alleen weer wat tot dusver is opgegraven en gepubliceerd; daarom is de dataset niet volledig. Als gevolg hiervan bestaat het risico van archaeological bias: het is mogelijk dat sommige sites zijn oververtegenwoordigd terwijl andere zijn ondervertegenwoordigd, omdat niet alle sites even grondig zijn opgegraven laat staan gepubliceerd. Om deze problemen het hoofd te bieden, heb ik alleen die contexten in beschouwing genomen die goed gedateerd zijn en is in de analyse uitsluitend de aan-of afwezigheid van (bepaalde typen) objecten op een site aangegeven (binair).

Het laatste inleidende hoofdstuk, hoofdstuk 6, behandelt de materialen die zijn gebruikt om de objecten te maken die in dit proefschrift worden onderzocht. Ik richt me hierbij vooral op hun fysieke en chemische kenmerken, op hun vindplaatsen in Egypte, of de plek waar ze in Egypte werden geïmporteerd. Daarbij ga ik ook in op de benaming van de materialen. Zo wordt bijvoorbeeld de term calciët-albast genoemd voor de steensoort die Egyptologen normaal aanduiden als simpelweg albast.

Na de inleidende hoofdstukken volgt het deel dat zich richt op de analyse van objecten. In Hoofdstuk 7 staan de kralen centraal. Tijdens het late Middenrijk, de belangrijkste spelers in de circulatie van kralen lijken te zijn gevestigd in Midden- en Boven-Egypte (vooral sites in het Memphis-Fajoem gebied). Kralen werden vanaf deze regio's gemaakt en verscheept of naar deze plaatsen getransporteerd, nieuwe trends konden hier ook beginnen. Dit is niet verwonderlijk, aangezien de meeste materialen afkomstig zijn uit de centrale en zuidoostelijke woestijn van Egypte, en de hoofdstad lag in het gebied van Memphis-Fajoem. De Dakhla Oase, Deir el-Ballas, Tod en Tell el-Dab'a zijn mogelijk tussenstations of (re)distributiecentra wat de circulatie van kralen betreft. Tijdens de vroege Tweede Tussenperiode waren de grote spelers Tell el-Dab'a, Harageh, Qau el-Kebir, en de Dakhla Oase wat betreft de kralen. Er lijken verbindingen te zijn tussen Tell el-Dab'a, Midden-Egypte en Abydos, terwijl de contacten met het zuidelijke deel van Boven-Egypte zowel via Harageh, Dakhla Oasis als Abydos lopen. Tegelijkertijd zien Edfu en Tod eruit als doorgangswegen of (re)distributiecentra in het netwerk van de kralen, waarschijnlijk omdat de materialen die voor kralen werden gebruikt voornamelijk afkomstig zijn uit de oostelijke woestijn in Boven-Egypte. Een deel van het materiaal dat verbonden wordt met deze plaatsen is afkomstig uit graven toegeschreven aan de Nubische cultuur of Pan Grave Culture, waardoor het waarschijnlijk is dat deze groep een rol speelde in de circulatie van kralen. Tijdens de late Tweede Tussenperiode zijn Tell el-Dab'a, Sedment, Mostagedda, Qau el-Kebir en het Thebaanse gebied de belangrijkste spelers in de circulatie van kralen. Tell Hebua lijkt een doorgang of (re)distributiecentrum in het kralennetwerk te zijn geweest. Tell el-Maskhuta, Lisht, Matmar, Balabish, Abydos, en Hu hebben een groot deel van hun materiële cultuur gemeen met andere sites. Tell el-Dab'a had voornamelijk contact met plaatsen in Midden-Egypte en Sedment. Ook het Thebaanse gebied lijkt in contact te staan met plaatsen in Midden-Egypte, evenals met Tell el-Dab'a.

In hoofdstuk 8 behandel ik het stenen vaatwerk. De resultaten laten zien dat tijdens het late Middenrijk Harageh, Rifeh, Abydos, Hu, Esna en Edfu belangrijke plaatsen waren in de circulatie van stenen vaatwerk. Dahshur, Riqqeh, Hawara, Lahun, Qasr el-Sagha en Ballas hebben veel typen met elkaar gemeen, maar deze omvatten niet de meest voorkomende soorten. De

sites die een rol lijken te spelen in de circulatie van stenen vaatwerk bevinden zich vooral in het Memphis-Fajoem gebied en in Boven-Egypte. Matmar, Qau el-Kebir en Denderah lijken doorgangen of (re)distributiecentra te zijn in het netwerk van stenen vaatwerk. Dit suggereert dat de circulatie van de potten vooral langs plaatsen ging naar en van het Memphis-Fajoem gebied. Tijdens de vroege Tweede Tussenperiode bevinden de sterkere verbindingen in het netwerk van stenen potten tussen Tell el-Dab'a en Edfu, terwijl de laatste ook is verbonden met Abydos en daarlangs ook met Tod. Tell el-Dab'a, Edfu en Abydos lijken een belangrijke rol in de verspreiding van stenen vaatwerk te hebben gespeeld. Tijdens de late Tweede Tussenperiode lijken de sites in Beneden-Egypte in contact te staan met sites in het zuidelijke deel van Boven-Egypte, voornamelijk via sites in Midden-Egypte. De plaatsen Tell Hebua, Sedment, Mostagedda en Qau el-Kebir waren belangrijk in de circulatie van stenen vaatwerk; Tell Hebua speelde hierbij de rol van bemiddelaar. Hu en Matmar hebben een groot deel van hun typen stenen vaatwerk gemeen met andere sites, maar dit deel omvatte niet de meest voorkomende type.

In hoofdstuk 9 worden afdrukken van scarabeeën en zegels behandeld. De resultaten tonen aan dat tijdens het late Middenrijk Lisht, Lahun, Harageh, Esna, Nubt en Elephantine een hoofdrol speelden in de circulatie van de gebruikte ontwerpen. Belangrijk zijn wederom het Memphis-Fajoem gebied en het zuidelijke deel van Boven-Egypte. Daarom waren dit plaatsen waar de ontwerpen die op scarabeeën en zegels werden gebruikt, en dus de objecten zelf, konden worden geproduceerd en verzonden of waarheen konden worden verzonden. Misschien is dit omdat Lisht, Lahun en Harageh zich in het gebied van de toenmalige hoofdstad bevonden Elephantine was een belangrijke plek om objecten naar Nubië te vervoeren. Edfu en Ballas lijken intermediair of (re)distributiecentra in hetzelfde netwerk te zijn geweest. Tijdens de vroege Tweede Tussenperiode zijn Tell el-Dab'a en Abydos de enige twee plekken die met elkaar zijn verbonden door middel van de scarabee en zegel ontwerpen, terwijl de Oase van Dakhla en Qau el-Kebir geïsoleerd lijken in dit netwerk. Dit zou kunnen duiden op een meer gelokaliseerde circulatie van scarabeeën en zegel ontwerpen. Aan het eind van de Tweede Tussenperiode lijken Tell el-Dab'a, Tell el-Yahudiyah en Sedment een rol te spelen in de circulatie van scarabee en zegels. Tell el-Maskhuta, Rifeh en Mostagedda hebben een groot deel van hun typen gemeen met andere sites, maar dit deel omvatte niet de meest voorkomende typen. Abydos lijkt een site te zijn waar de ontwerpen, of zelfs de objecten zelf, langs werden vervoerd. Contacten in deze periode liepen voornamelijk tussen plaatsen in de Delta en die in Midden-Egypte, terwijl de contacten tussen Beneden-Egypte en het zuidelijke deel van Boven-Egypte voornamelijk via Sedment, Abydos en – in mindere mate – de Oase van Dakhla liepen.

Hoofdstuk 10 is gewijd aan de analyse van het Tell el-Yahudiyah aardewerk. De resultaten suggereren dat, tijdens het late Middenrijk, Lahun, Lisht en mogelijk Harageh de plaatsen waren waar het Tell el-Yahudiyah aardewerk voornamelijk circuleerde. Dit is niet verwonderlijk, want deze plaatsen bevinden zich in het Memphis-Fajoem gebied, waar zich toen de hoofdstad van Egypte bevond. Tell el-Dab'a speelde een rol als (re)distributiecentrum in de circulatie van het Tell el-Yahudiyah-aardewerk. Al met al betreft de circulatie van deze categorie objecten in deze periode voornamelijk locaties in Beneden-Egypte en het Memphis-Fajoem gebied. Tijdens de vroege Tweede Tussenperiode zijn de enige verbindingen die via het netwerk van de Tell el-Yahudiyah aardewerk zijn ontdekt, tussen Tell el-Dab'a en respectievelijk Memphis en Abydos. Tijdens de late Tweede Tussenperiode lijken Tell el-Yahudiyah en mogelijk Harageh, Rifeh en Abydos de locaties te zijn waar het Tell el-Yahudiyah-aardewerk naartoe of van daar werd gestuurd. Al met al lijkt de circulatie van dit aardewerk voornamelijk beperkt te zijn geweest tot plaatsen in Beneden-en Midden-Egypte. Tell el-Dab'a lijkt echter een belangrijke rol te spelen in de distributie van het Tell el-Yahudiyah aardewerk.

Het Cypriotisch aardewerk wordt behandeld in hoofdstuk 11. Vóór de late Tweede Tussenperiode gaat het vrijwel uitsluitend om geïmporteerd aardewerk. Tell el-Dab'a lijkt de belangrijkste of zelfs enige Egyptische plaats te zijn die toen contacten onderhield met Cyprus. Het Cypriotische aardewerk suggereert verder geen enkele band tussen Tell el-Dab'a en andere Egyptische plaatsen. Slechts enkele exemplaren die dateren uit het late Middenrijk worden buiten Tell el-Dab'a gevonden, en alleen in het gebied van de hoofdstad van die tijd (Memphis-Fajoem). Tijdens de late Tweede Tussenperiode speelden Tell el-Dab'a, en waarschijnlijk ook Tell el-Maskhuta, Sedment, Tarkhan en Abydos, een speciale rol in de circulatie van Cypriotisch aardewerk, dat zich voornamelijk richt op de Nijl Delta en het Memphis-Fajoem-gebied. Kortom, de analyse van het Cypriotische aardewerk toont dat er sterke contacten waren tussen Tell el-Dab'a en Cyprus, en zwakke connecties tussen Tell el-Dab'a en andere plaatsen in Egypte.

En uiteindelijk worden in hoofdstuk 12 de metalen wapens behandeld. De resultaten laten zien dat Tell el-Dab'a, Lahun en Hu tijdens het late Middenrijk een speciale rol speelden in de circulatie van wapens. Er zijn twee groepen te identificeren, waarvan één gevormd wordt door Tell el-Dab'a, Esna en Lisht, en één gevormd wordt door Hu, Qau el-Kebir en Lahun. Dit kunnen dus regio's zijn met verschillende sociale praktijken, hoewel, gezien het kleine aantal objecten, verdere analyse nodig is voordat we deze conclusie met zekerheid kunnen trekken. Tijdens de vroege Tweede Tussenperiode zijn alleen Tell el-Dab'a en Hu met elkaar verbonden aan de hand van slechts één type mes. Aan het eind van de Tweede Tussenperiode kunnen we weer twee

groepen identificeren. De eerste betreft plaatsen in Beneden-Egypte (Tell el-Maskhuta, Tell el-Dab'a en Tell el-Yahudiyah), waarvan bekend is dat zij een vergelijkbare materiële cultuur hebben, met kenmerken die van oudsher geassocieerd worden met Syrië-Palestina. De tweede groep betreft plaatsen uit Midden-Egypte, vooral waar ook sporen zijn vastgesteld van de Pan Grave Culture (Mostagedda, Qau el-Kebir, en Balabish). De genoemde plaatsen lijken een bijzondere rol te hebben gespeeld in de circulatie van metalen wapens. Het Thebaanse gebied heeft geen verbindingen met andere plaatsen en lijkt dus een derde, afzonderlijk cluster te vormen. Gezien het feit dat wapens meestal in graven worden gevonden, kan de beschreven situatie mogelijk een reflectie zijn van verschillen in grafrituelen.

Na het deel gewijd aan de verschillende typen objecten volgen twee afrondende hoofdstukken. Grondstoffen worden bestudeerd in hoofdstuk 13. Het blijkt dat tijdens het late Middenrijk lithisch materiaal wijdverspreid waren en ook ver van hun oorspronkelijke bron gebieden werden vervoerd. Vooral kostbare en geïmporteerde steensoorten werden vervoerd via het Memphis-Fajoem gebied, waar ze waarschijnlijk als grondstof werden vervoerd en verwerkt tot afgewerkte objecten in de koninklijke werkplaatsen in dat gebied. De meest wijdverspreide steensoorten hebben meestal een meer gelokaliseerde productie. Van de metalen lijkt alleen goud te zijn bewerkt in koninklijke werkplaatsen in het Memphis-Fajoem gebied, terwijl zilver, dat waarschijnlijk werd geïmporteerd en Egypte binnenkwam via Tell el-Dab'a, alsook koperen voorwerpen, het meest werden geproduceerd conform lokale tradities. Ten slotte suggereren bot en schelp, vooral wat kralen betreft, dat Midden-en Boven-Egypte verschillende tradities volgden. Tijdens de vroege Tweede Tussenperiode nam de verscheidenheid aan lithische materialen af, en deze materialen lijken voornamelijk te circuleren tussen Beneden-en Midden-Egypte. Het Memphis-Fajoem gebied maakte nog deel uit van het netwerk van edelstenen en van steensoorten die Egypte binnenkwamen via Tell el-Dab'a. Toen de materialen konden worden gevonden in zowel het centrale als zuidelijke deel van de Egyptische oostelijke woestijn, schijnen de bronnen in het centrale deel de meest gebruikte te zijn geweest, terwijl de bronnen uit het zuidelijke deel alleen werden verkregen als ze beschikbaar waren in de buurt van de Wadi Hammamat en de Wadi Barramiya. Materiaal uit de meest zuidelijke delen van de Egyptische oostelijke woestijn werd naar Beneden-Egypte getransporteerd via routes die zowel door de oases in de westelijke woestijn als via plaatsen in Midden-Egypte. De gemeenschappen van de Pan Grave Culture speelde waarschijnlijk een rol in de communicatie tussen verschillende delen van Egypte, zoals gesuggereerd door het groeiende belang van sites die door deze groepen werden bewoond, en door de materialen die op deze sites zijn gevonden. Zilver, samen met objecten gemaakt van bot en

schelp, lijken een indicator te zijn van deze gemeenschappen van de Pan Grave Culture. Steensoorten die meer uit het zuiden van Egypte kwamen, zijn in deze tijd niet gevonden. De verdeling van de objecttypes, in combinatie met de distributie van materialen, suggereert dat steen lokaal werd bewerkt of in Tell el-Dab'a. Tegelijkertijd vertonen metalen voorwerpen een veelal plaatselijke productie. Tijdens de late Tweede Tussenperiode lijken lithische materialen steeds vaker te circuleren tussen Beneden- en Midden-Egypte, hoewel er contacten plaatsvonden tussen Beneden-Egypte en het zuidelijke deel van Boven-Egypte. Het Memphis-Fajoem gebied was vooral relevant als toegangspunt tot de woestijnroutes door de westelijke woestijn, destijds een belangrijke route voor communicatie tussen. De materialen uit de zuidelijke delen van de Egyptische oostelijke woestijn lijken als grondstof te zijn verscheept en lokaal te zijn bewerkt, ook al circuleerden ze meer dan in de voorgaande periode en werden ze van dieper uit de woestijn gehaald. De steensoorten uit de Sinaï en de stenen geïmporteerd uit de Levant waren alleen aanwezig in Tell el-Dab'a. Bergkristal werd gewonnen uit de westelijke woestijn, en niet de Sinaï. Steensoorten die vanuit het zuiden naar Egypte konden worden geïmporteerd, bereikten nog steeds het Memphis-Fajoem gebied. Wat metalen betreft toont goud een relatie aan tussen Beneden- en Boven-Egypte, terwijl koper en zilver meer afhankelijk waren van meer beperkte regionale tradities. Objecten van koper suggereren het bestaan van drie grote regio's: Beneden-Egypte, Midden-Egypte en het Thebaanse gebied. Objecten van zilver lijken te zijn verbonden met plaatsen waar de Pan Grave Culture sporen heeft achtergelaten, vergelijkbaar met been kralen.

In hoofdstuk 14 presenteer ik de conclusies van het huidige onderzoek. Tijdens het late Midden rijk zijn de activiteiten van een gecentraliseerd bestuur, gevestigd in de hoofdstad, nog steeds zichtbaar in het gebied van Memphis-Fajoem. Dit bestuur beheerste de circulatie van materialen en was ook een belangrijk productie- en (re)distributiecentrum voor de belangrijkste soorten objecten, vooral voor zover het kostbare objecten betreft. Deze objecten werden zowel via de Nijlvallei als door de Westelijke Woestijn getransporteerd. De materiële cultuur was over het algemeen uniform, ook al zijn er verschillen zichtbaar in typen objecten die de aanwezigheid van, of contacten met, buitenlandse gemeenschappen suggereren. Tijdens de vroege Tweede Tussenperiode werd Tell el-Dab'a belangrijk, omdat het onafhankelijk was geworden onder de 14e Dynastie en als gevolg daarvan grondstoffen kon verwerven en de meer gebruikelijke soorten objecten kon produceren en distribueren. Handel en uitwisselingen vond nog steeds plaats tussen Beneden-Egypte en het Memphis-Fajoem gebied, evenals met Boven-Egypte, meestal via de woestijnroutes. Gemeenschappen van de Pan Grave Culture werden belangrijker en speelden een rol in de (handels)wegen naar de grondstoffen. Tijdens de

late Tweede Tussenperiode was Tell el-Dab'a, onder de heerschappij van de Hyksos, een belangrijke plaats en had invloed op andere sites in de oostelijke Delta, evenals op de goederenstroom tussen Egypte en de Levant. Het gebruik van de woestijnroutes blijkt uit de plaatsen in het Memphis-Fajoem gebied, die nauwe contacten onderhielden met de Hyksos. Niettemin laten sites in Midden-Egypte, zoals Qau el-Kebir en Mostagedda – die sterke banden hadden met zowel Beneden-als het zuidelijke deel van Boven-Egypte – niet alleen zien dat mensen door het Nijldal reisden, maar ook dat gemeenschappen van de Pan Grave Culture nog steeds belangrijk waren in het communicatie-en handelsverkeer. De gemeenschappen begraven in Matmar en Rifeh maakten ook deel uit van de routes tussen Beneden- en Boven-Egypte, maar stonden respectievelijk onder invloed van de Hyksos en van andere gemeenschappen van de Pan Grave Culture zoals die vertegenwoordigd waren in Qau el-Kebir en Mostagedda. In Boven-Egypte was het Thebaanse gebied, dat waarschijnlijk het centrum was van de koninkrijken van de 16e en van de 17e Dynastie, een belangrijke plaats, terwijl de gemeenschappen die in Hu en Abydos vertegenwoordigd waren, een brug sloegen tussen Beneden-en Boven-Egypte en de bronnen van de oostelijke woestijn. De in Hu begraven gemeenschap had nauwe contacten met de belangrijkste gemeenschappen van de Pan Grave Culture, zoals die in Qau el-Kebir en Mostagedda. Zij onderhielden ook contacten met de Thebaanse heersers en tonen het belang aan van de woestijnroutes, waartoe Hu een toegangspunt was. Abydos onderhield banden met de Hyksos, waarschijnlijk omdat het aan de grens van het Thebaanse koninkrijk lag en daarom een ontmoetings punt was voor mensen en goederen uit de gebieden beheerst door de Hyksos én het Thebaanse koninkrijk. Desalniettemin kunnen de resultaten er ook op wijzen dat Abydos aan het begin van de late Tussenperiode werd geregeerd door de Hyksos. Ten slotte zou Elephantine ook een apart territorium kunnen zijn geweest, met zelfs nauwere contacten met Nubië dan met de rest van Egypte, maar er zijn helaas onvoldoende gegevens beschikbaar om deze hypothese nader uit te werken.

CURRICULUM VITAE

Arianna Sacco was born and raised in Naples. She holds a Bachelor's degree in Cultural Heritage (2007) and a Master's degree in Archaeology (2009), both from the University of Naples l'Orientale, as well as a Master's degree in Interdisciplinary Approaches to History, Archaeology and Social Anthropology (2012) from the University of Thessaly.

Arianna has been a team member in the digitization project for Dillmann's Lexicon of Ethiopic. At Leiden University, Arianna has been a member and chair of the LIAS & LUCSoR PhD Council, and a member of the Ancient Worlds Network Leiden. She has been a member of the organizing committee of the Conference for Attic Ware in Thessaly, held at the University of Thessaly from 3–5 December 2010, and of the Leiden Asia Year Graduate Conference, held at Leiden University on 13 September 2017. Between 2007 and 2011, Arianna has taken part in several excavations in Greece and Italy. Since 2012, she has regularly given presentations at international conferences both in Leiden and abroad (Cairo, London, Naples, Munich). She has also been active in public outreach, publishing in popularizing magazines as well as online.

Arianna holds the following language diplomas: English certificate ECPE from the University of Michigan, level C2 (year 2011); Modern Greek certifications from the Centre for Greek Language, levels Γ and Δ (both year 2010); Modern Greek certifications from the Centre for Greek Language, levels A and B (both year 2009); French certificate DELF from the French Ministry of Education, level B1 (year 2009).

