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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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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.

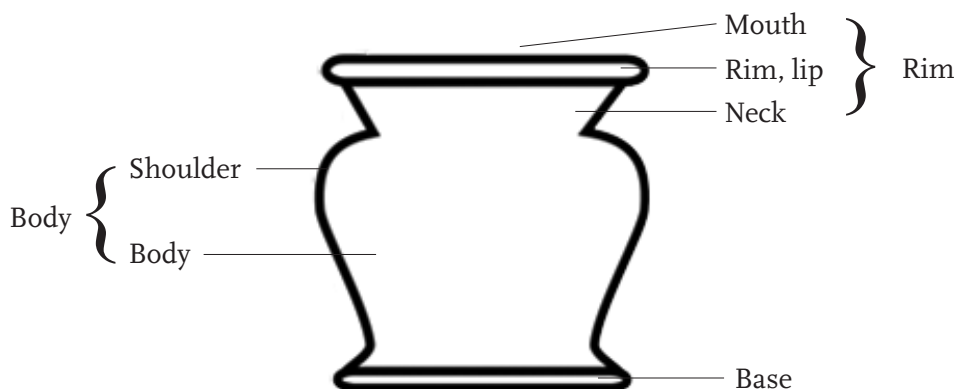
19 Lilyquist 1995, 3–4; Sparks 2003, 46–47.

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





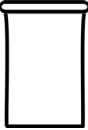


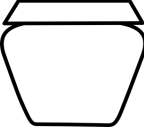
The main parts recognized in a vessel in pottery studies include:

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.

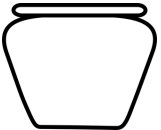
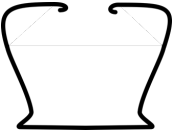
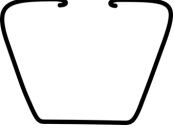


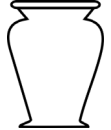


25 It should also be mentioned that these vessels were sometimes closed by lids. However, the data available are too few to make any distinction among lids, therefore they have not been included in the analysis.

No.	Description	Drawing
1	<p>Body: flaring; cylindrical but narrower at the centre and larger towards the rim and the base.</p> <p>Rim: rounded, with round section.</p> <p>Base: outward, larger than the body.</p>	
2	<p>Body: flaring; cylindrical but narrower at the centre and larger towards the rim and the base.</p> <p>Rim: rounded, with round section.</p> <p>Base: outward rounded, larger than the body and with protruding rim.</p>	
3	<p>Body: cylindrical, without change in the circumference.</p> <p>Rim: direct, simple and directly connected to the body.</p> <p>Base: flat, as large as the body.</p>	
4	<p>Body: cylindrical, without change in the circumference.</p> <p>Rim: direct, simple and directly connected to the body.</p> <p>Base: flat on a pedestal with feet.</p>	
5	<p>Body: cylindrical, without change in the circumference.</p> <p>Rim: rounded, with round section.</p> <p>Base: flat, as large as the body.</p>	
6	<p>Body: squat shouldered; wider than tall, with the largest circumference at the shoulder.</p> <p>Rim: folded-over, with triangular section larger at the bottom.</p> <p>Base: outward, larger than the body.</p>	
7	<p>Body: squat shouldered; wider than tall, with the largest circumference at the shoulder.</p> <p>Rim: folded-over, with triangular section larger at the bottom.</p> <p>Base: outward rounded, larger than the body and with protruding rim.</p>	
8	<p>Body: squat shouldered; wider than tall, with the largest circumference at the shoulder.</p> <p>Rim: folded-over, with triangular section larger at the bottom.</p> <p>Base: flat, as large as the body.</p>	






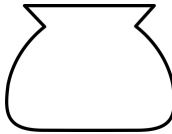
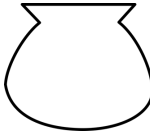
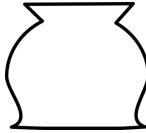
(continued)

No.	Description	Drawing
9	<p>Body: squat shouldered; wider than tall, with the largest circumference at the shoulder.</p> <p>Rim: flaring direct, simple and connected to the body through a flaring neck, larger at the top.</p> <p>Base: outward, larger than the body.</p>	
10	<p>Body: squat shouldered; wider than tall, with the largest circumference at the shoulder.</p> <p>Rim: flaring direct, simple and connected to the body through a flaring neck, larger at the top.</p> <p>Base: outward rounded, larger than the body and with protruding rim.</p>	
11	<p>Body: squat shouldered; wider than tall, with the largest circumference at the shoulder.</p> <p>Rim: flaring rounded, with round section and connected to body through flaring neck, larger at top.</p> <p>Base: outward, larger than the body.</p>	
12	<p>Body: squat shouldered; wider than tall, with largest circumference at shoulder.</p> <p>Rim: flaring rounded, with round section and connected to body through flaring neck, larger at top.</p> <p>Base: outward rounded, larger than body, with protruding rim.</p>	
13	<p>Body: squat shouldered; wider than tall, with largest circumference at shoulder.</p> <p>Rim: flaring rounded, with round section and connected to body through a flaring neck, larger at top.</p> <p>Base: flat, as large as the body.</p>	
14	<p>Body: squat shouldered; wider than tall, with largest circumference at shoulder.</p> <p>Rim: flat everted, with flat section and connected to body through narrow neck.</p> <p>Base: outward, larger than body.</p>	
15	<p>Body: squat shouldered; wider than tall, with largest circumference at shoulder.</p> <p>Rim: flat everted, with flat section and connected to body through narrow neck.</p> <p>Base: outward rounded, larger than body and with protruding rim.</p>	
16	<p>Body: squat shouldered; wider than tall, with largest circumference at the shoulder.</p> <p>Rim: rounded, with round section.</p> <p>Base: outward rounded, larger than body and with protruding rim.</p>	

(continued)

No.	Description	Drawing
17	<p>Body: squat shouldered; wider than tall, with the largest circumference at the shoulder.</p> <p>Rim: rounded, with round section.</p> <p>Base: flat, as large as the body.</p>	
18	<p>Body: squat shouldered; wider than tall, with the largest circumference at the shoulder.</p> <p>Rim: inward, slightly going inside the opening.</p> <p>Base: outward, larger than the body.</p>	
19	<p>Body: squat shouldered; wider than tall, with the largest circumference at the shoulder.</p> <p>Rim: inward, slightly going inside the opening.</p> <p>Base: flat, as large as the body.</p>	
20	<p>Body: piriform; taller than wide, with the largest circumference at the shoulder.</p> <p>Rim: flaring direct, simple and connected to the body through a flaring neck, larger at the top.</p> <p>Base: outward, larger than the body.</p>	
21	<p>Body: piriform; taller than wide, with the largest circumference at the shoulder.</p> <p>Rim: flaring direct, simple and connected to the body through a flaring neck, larger at the top.</p> <p>Base: flat, as large as the body.</p>	
22	<p>Body: piriform; taller than wide, with the largest circumference at the shoulder.</p> <p>Rim: flaring rounded, with round section and connected to the body through a flaring neck, larger at the top.</p> <p>Base: outward, larger than the body.</p>	
23	<p>Body: piriform; taller than wide, with the largest circumference at the shoulder.</p> <p>Rim: flaring rounded, with round section and connected to the body through a flaring neck, larger at the top.</p> <p>Base: flat, as large as the body.</p>	
24	<p>Body: piriform; taller than wide, with the largest circumference at the shoulder.</p> <p>Rim: flaring rounded, with round section and connected to the body through a flaring neck, larger at the top.</p> <p>Base: pointed, ending in a tip.</p>	

(continued)

No.	Description	Drawing
25	<p>Body: piriform; taller than wide, with the largest circumference at the shoulder.</p> <p>Rim: inward, slightly going inside the opening.</p> <p>Base: outward, larger than the body.</p>	
26	<p>Body: piriform; taller than wide, with the largest circumference at the shoulder.</p> <p>Rim: inward, slightly going inside the opening.</p> <p>Base: flat, as large as than the body.</p>	
27	<p>Body: drop-shaped; taller than wide, with the largest circumference near the base.</p> <p>Rim: flaring scaled, made of superimposed round sections, progressively larger towards the top.</p> <p>Base: pointed, ending in a tip.</p>	
28	<p>Body: drop-shaped; taller than wide, with the largest circumference near the base.</p> <p>Rim: flaring direct, simple and connected to the body through a flaring neck, larger at the top.</p> <p>Base: flat, as large as the body.</p>	
29	<p>Body: drop-shaped; taller than wide, with the largest circumference near the base.</p> <p>Rim: flaring direct, simple and connected to the body through a flaring neck, larger at the top.</p> <p>Base: round, making a rounded convex curve.</p>	
30	<p>Body: bag-shaped; wider than tall, with the largest circumference near the base.</p> <p>Rim: flaring direct, simple and connected to the body through a flaring neck, larger at the top.</p> <p>Base: flat, as large as the body.</p>	
31	<p>Body: bag-shaped; wider than tall, with the largest circumference near the base.</p> <p>Rim: flaring direct, simple and connected to the body through a flaring neck, larger at the top.</p> <p>Base: round, making a rounded convex curve.</p>	
32	<p>Body: round, with the largest circumference in its middle.</p> <p>Rim: flaring direct, simple and connected to the body through a flaring neck, larger at the top.</p> <p>Base: outward, larger than the body.</p>	

(continued)



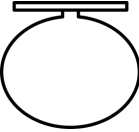


No.	Description	Drawing
33	Body: round, with the largest circumference in its middle. Rim: folded-over, with triangular section larger at the bottom. Base: outward, larger than the body.	
34	Body: globular, with spherical body. Rim: flaring rounded, with round section and connected to the body through 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.

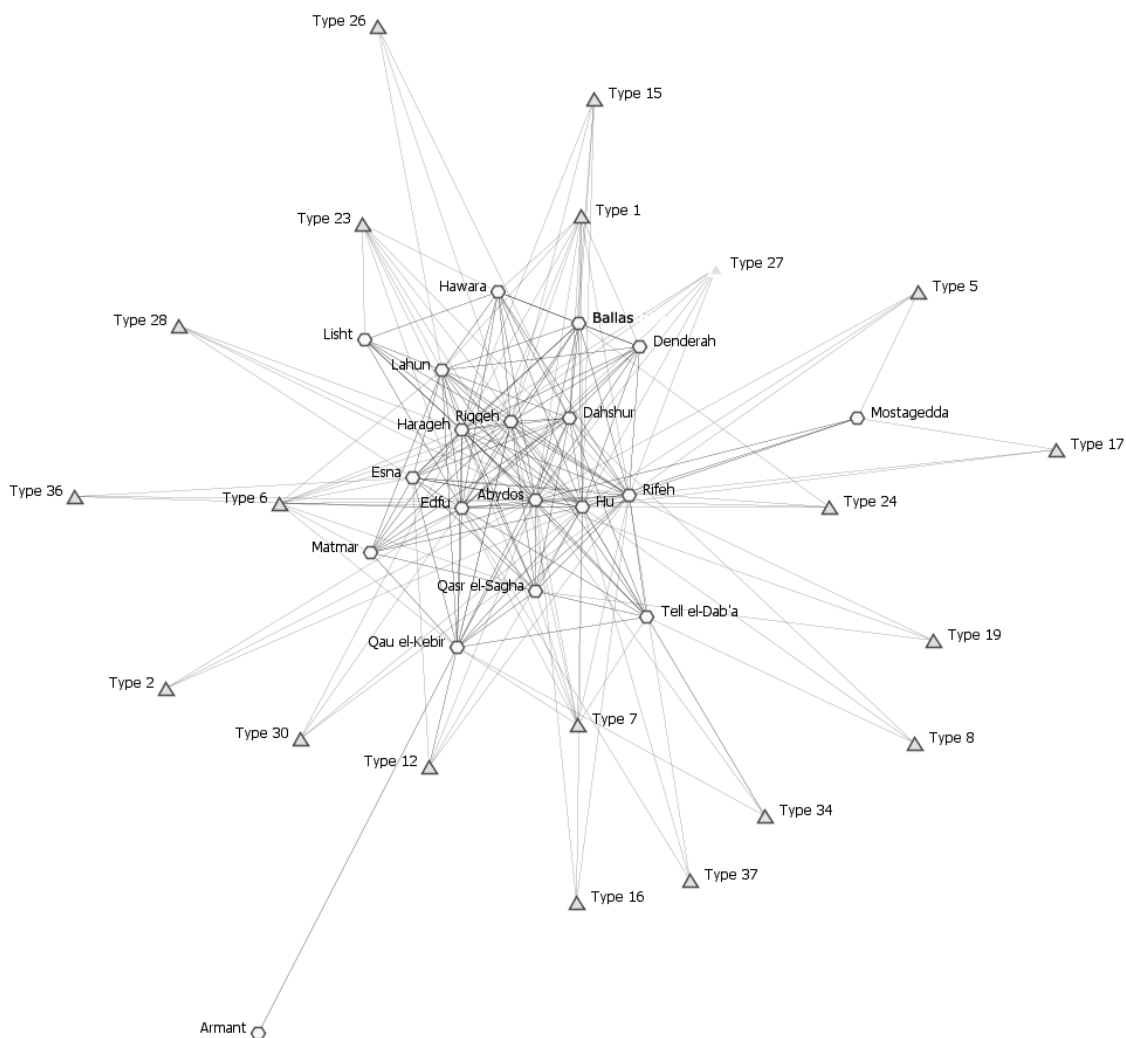


Figure 28: Contexts of the Late Middle Kingdom and the most common stone vessels.

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.

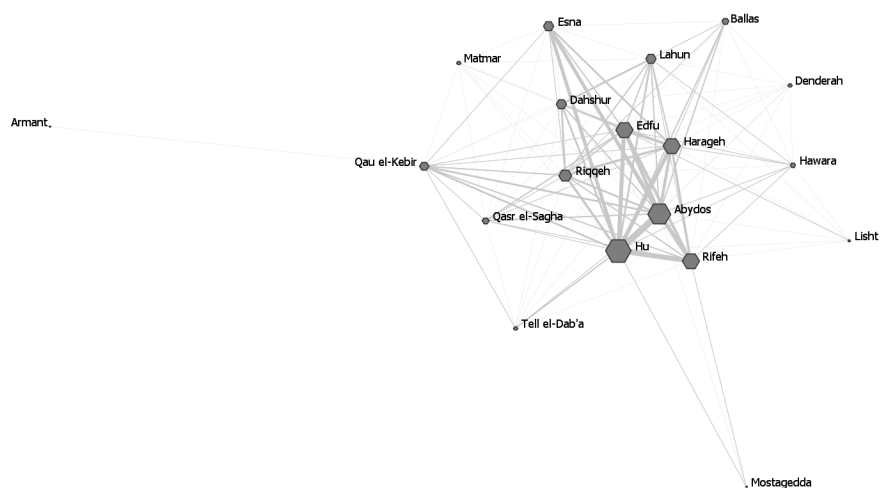


Figure 29: Degree centrality of the first one-mode graph of the stone vessels during the LMK.

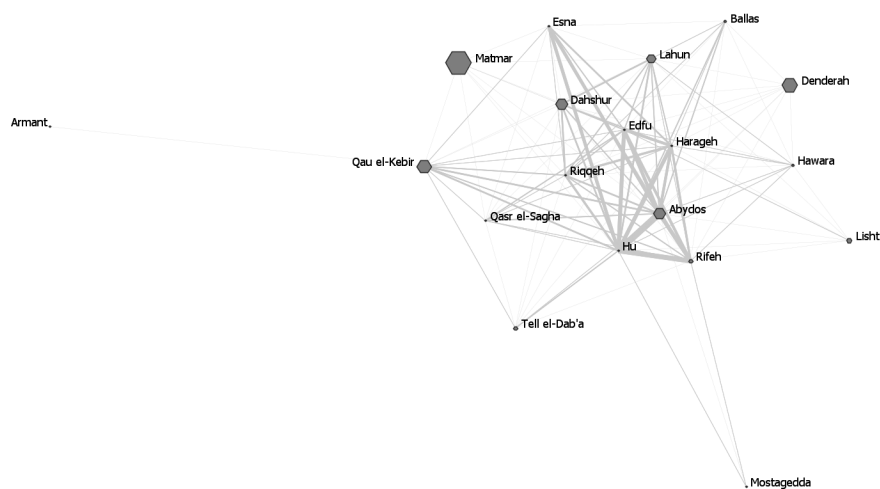


Figure 30: Betweenness centrality of the first one-mode graph of the stone vessels during the LMK.

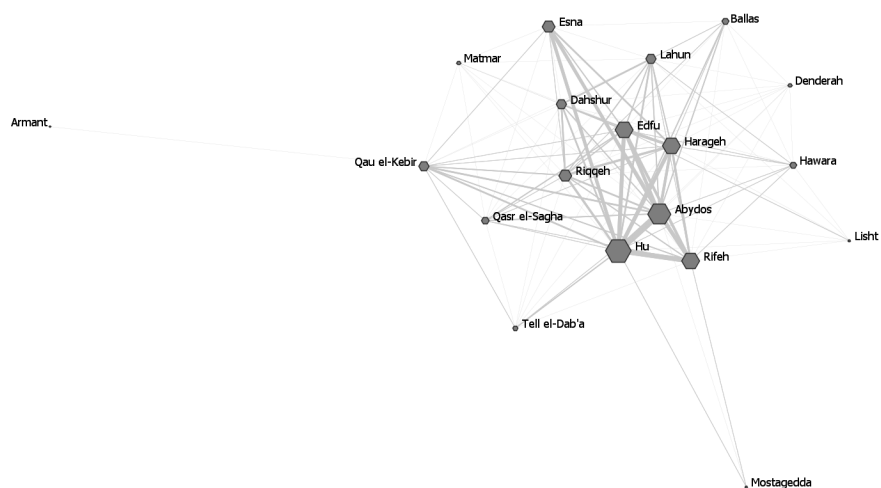


Figure 31: Eigenvector centrality of the first one-mode graph of the stone vessels during the LMK.

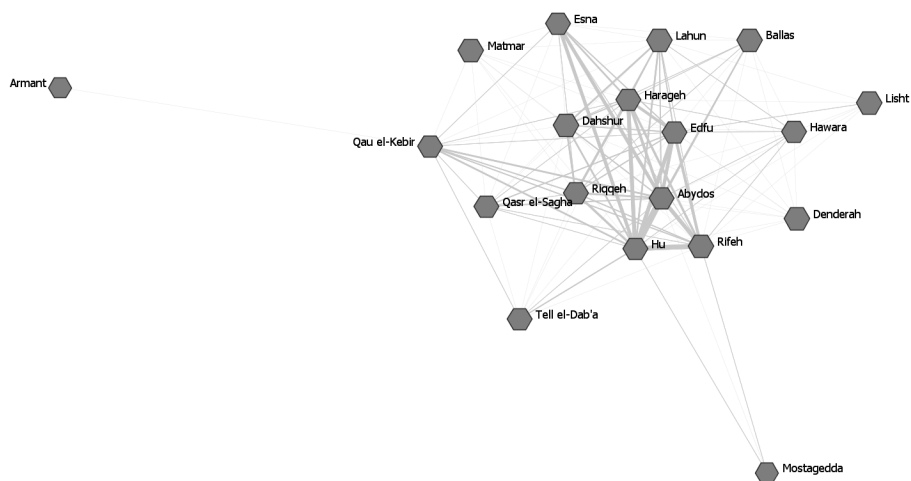


Figure 32: Closeness centrality of the first one-mode graph of the stone vessels during the LMK.

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

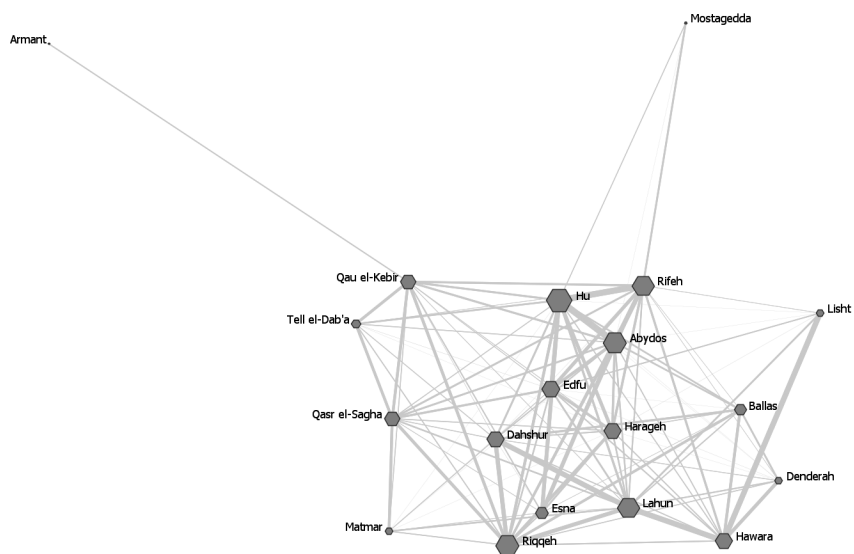


Figure 33: Degree centrality of the second one-mode graph of the stone vessels during the LMK.

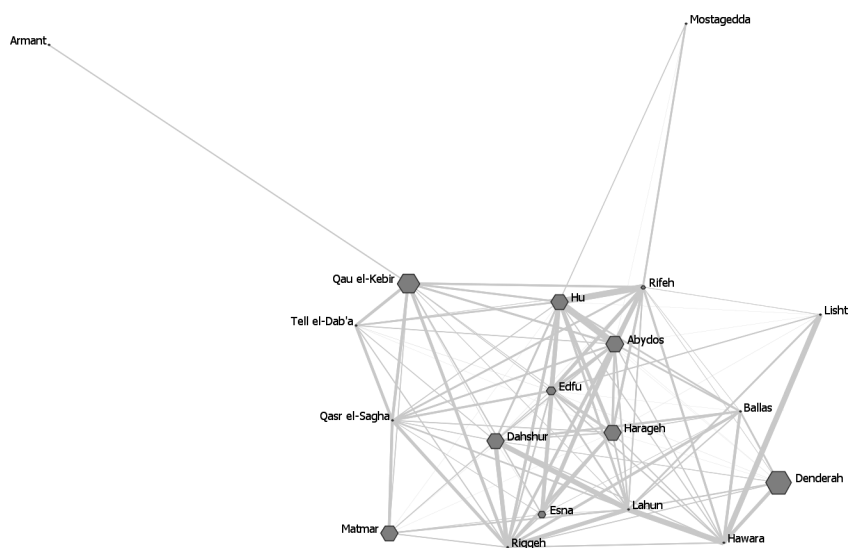


Figure 34: Betweenness centrality of the second one-mode graph of the stone vessels during the LMK.

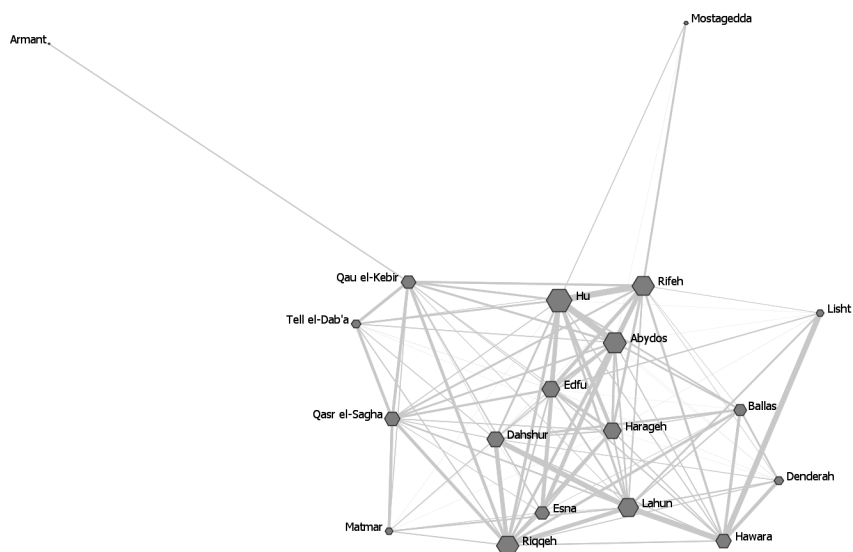


Figure 35: Eigenvector centrality of the second one-mode graph of the stone vessels during the LMK.

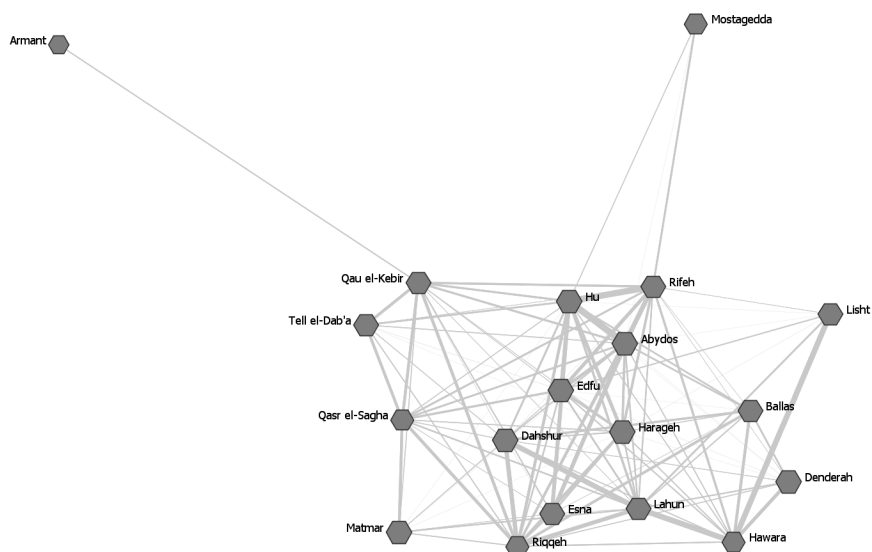


Figure 36: Closeness centrality of the second one-mode graph of the stone vessels during the LMK.

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.

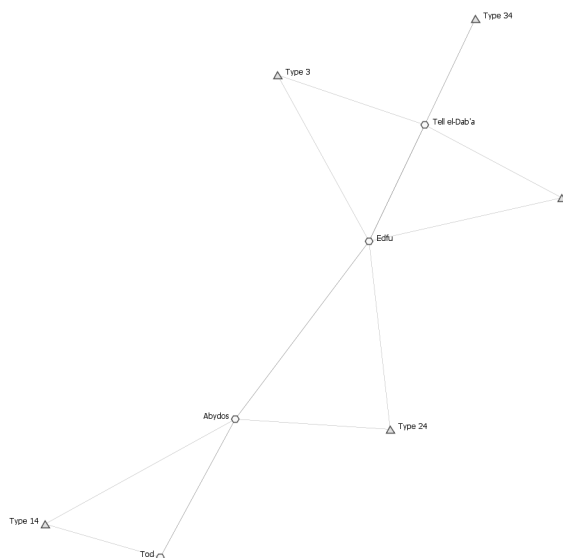
The last group of sites, including Dahshur, Hawara, Lahun, Qasr el-Sagha, and Ballas have different scores in the two mode graphs. While in the previous graph all these sites score mostly in the lowest ranks and at most in the middle rank, in the present graph they score in the high or very high rank. 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, Soukiassian, 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, Soukiassian, 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.

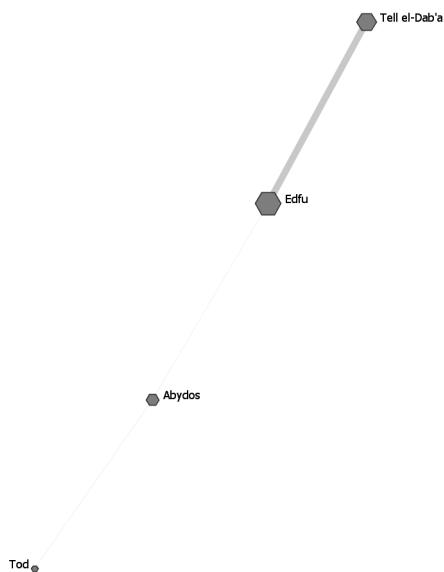


Figure 38: Degree centrality of the first one-mode graph of the stone vessels during the ESIP.

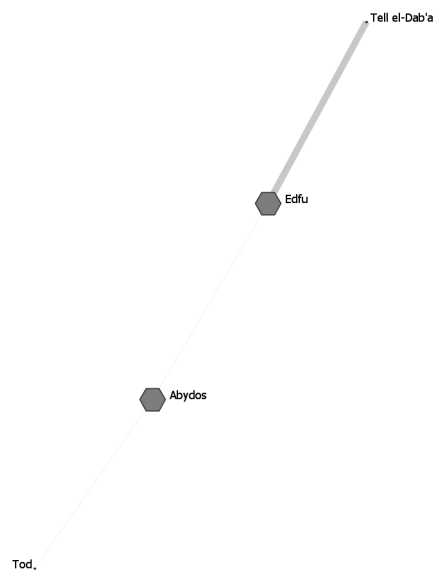


Figure 39: Betweenness centrality of the first one-mode graph of the stone vessels during the ESIP.

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.

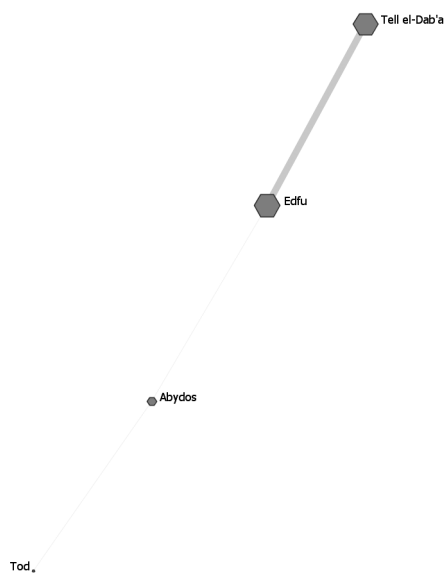


Figure 40: Eigenvector centrality of the first one-mode graph of the stone vessels during the ESIP.

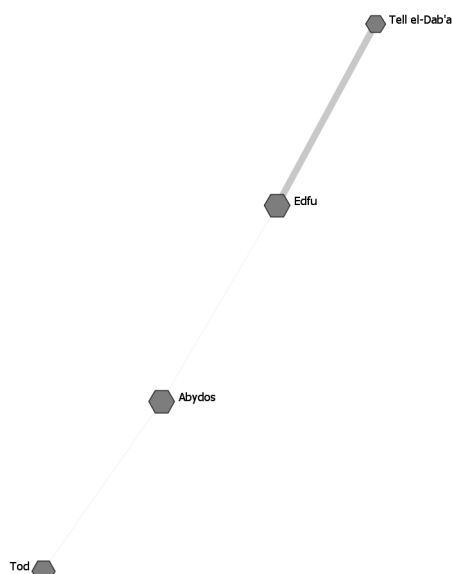


Figure 41: Closeness centrality of the first one-mode graph of the stone vessels during the ESIP.

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

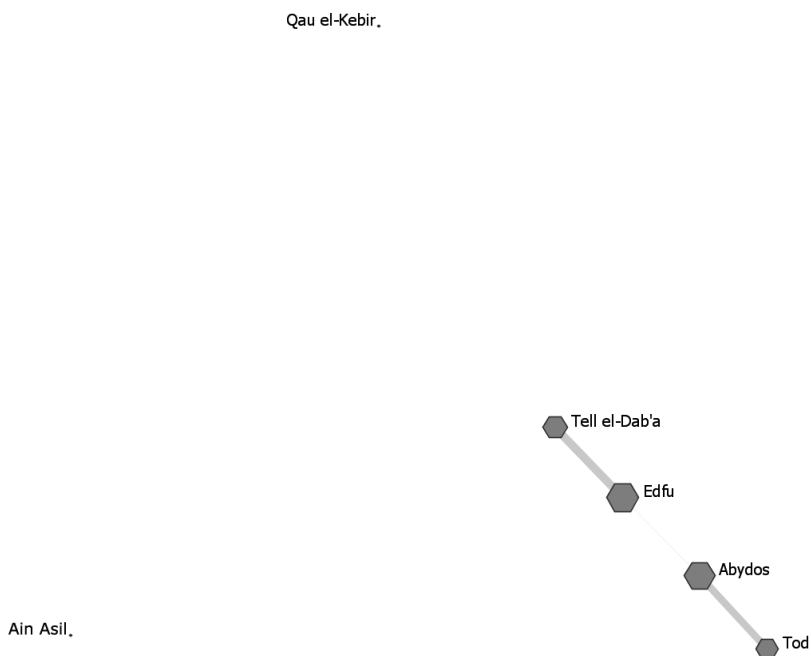


Figure 42: Degree centrality of the second one-mode graph of the stone vessels during the ESIP.

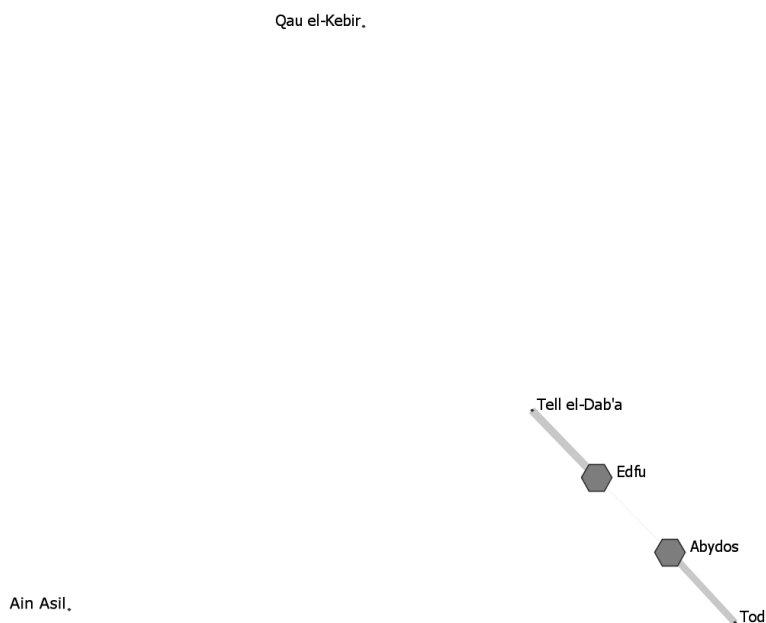


Figure 43: Betweenness centrality of the second one-mode graph of the stone vessels during the ESIP.

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.

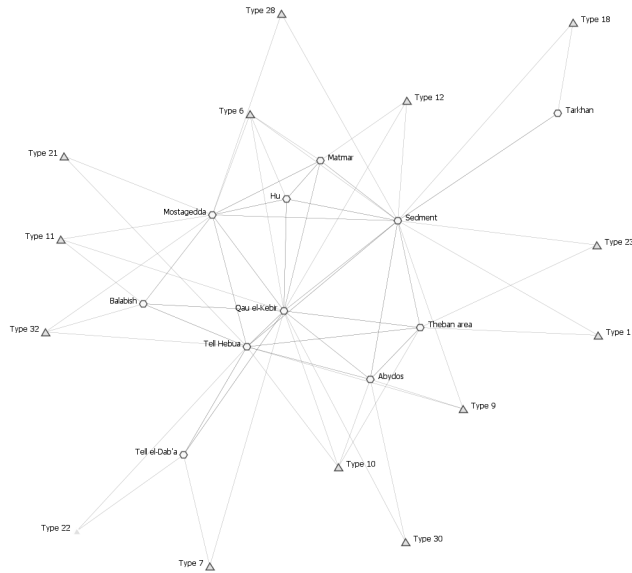


Figure 46: Contexts of the Late Second Intermediate Period and the most common stone vessels.

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.

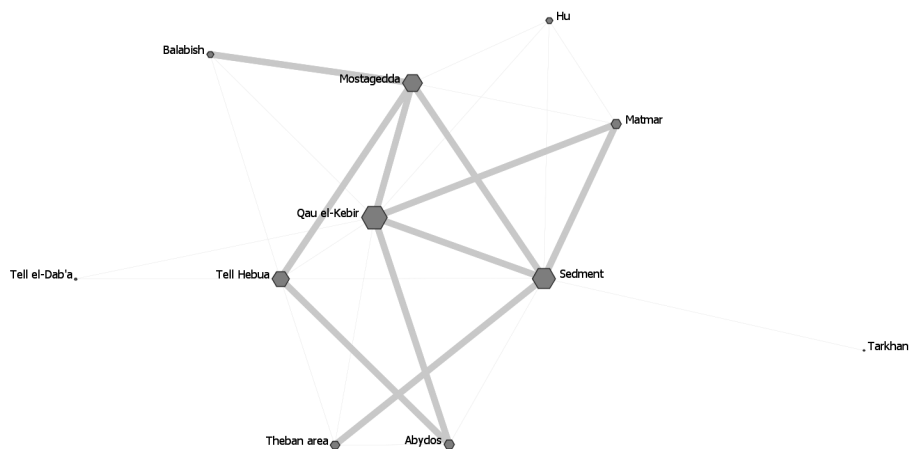


Figure 47: Degree centrality of the first one-mode graph of the stone vessels during the LSIP.

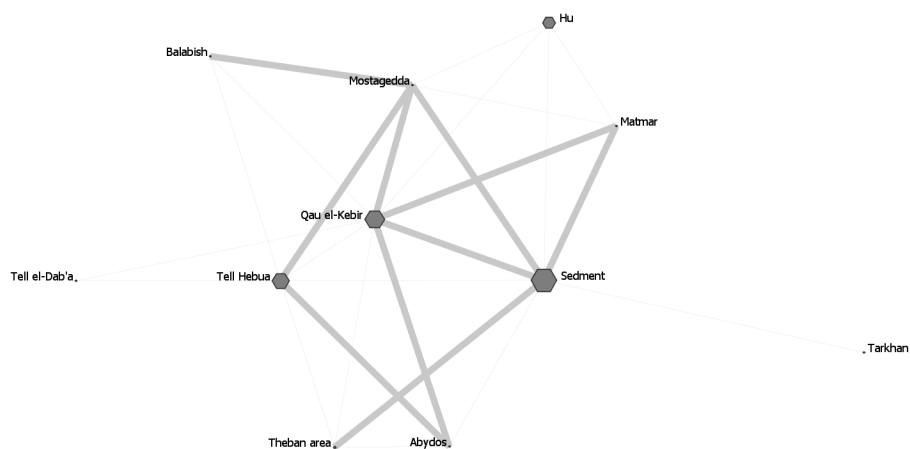


Figure 48: Betweenness centrality of the first one-mode graph of the stone vessels during the LSIP.

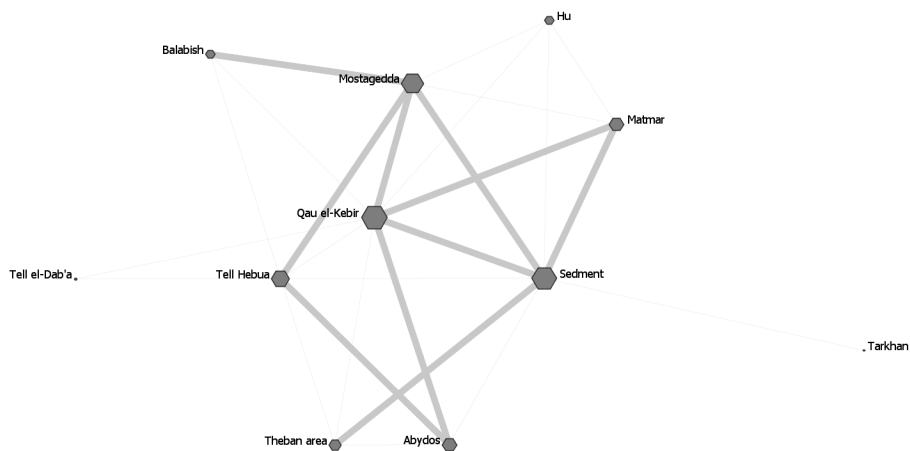


Figure 49: Eigenvector centrality of the first one-mode graph of the stone vessels during the LSIP.

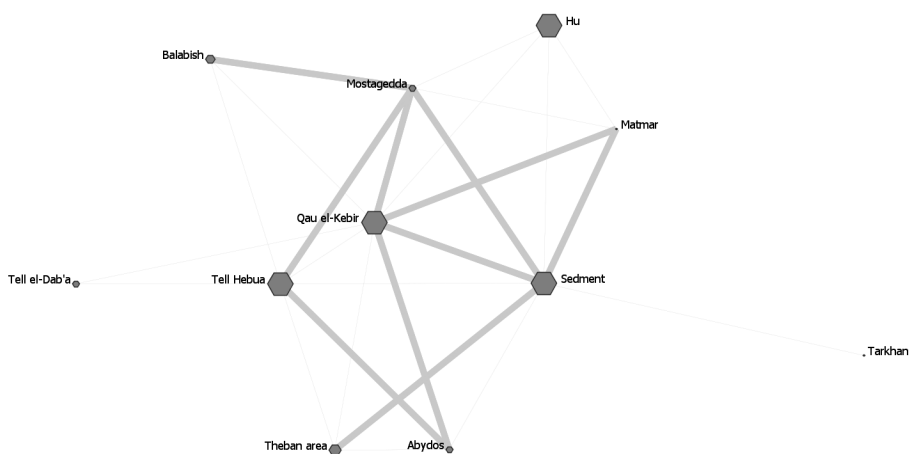


Figure 50: Closeness centrality of the first one-mode graph of the stone vessels during the LSIP.

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.

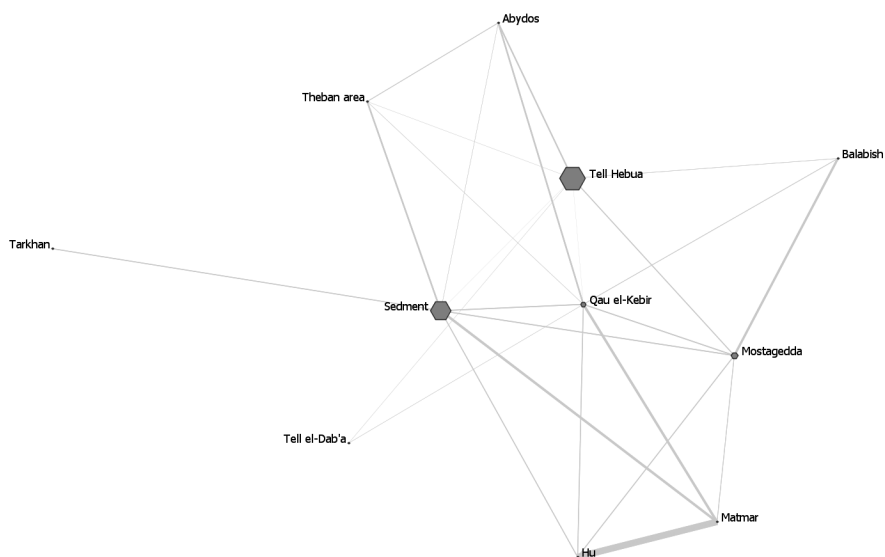


Figure 52: Betweenness centrality of the second one-mode graph of the stone vessels during the LSIP.

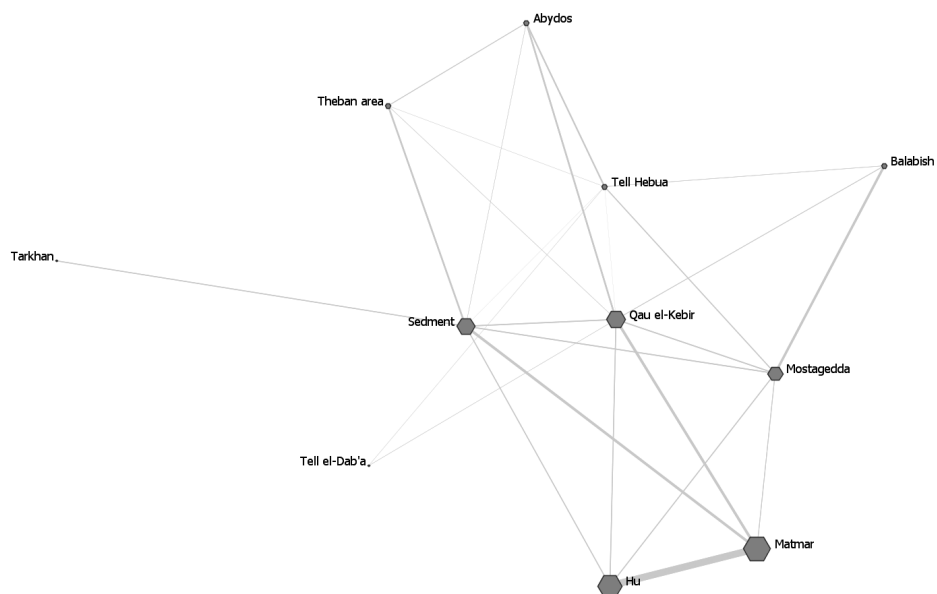


Figure 53: Eigenvector centrality of the second one-mode graph of the stone vessels during the LSIP.

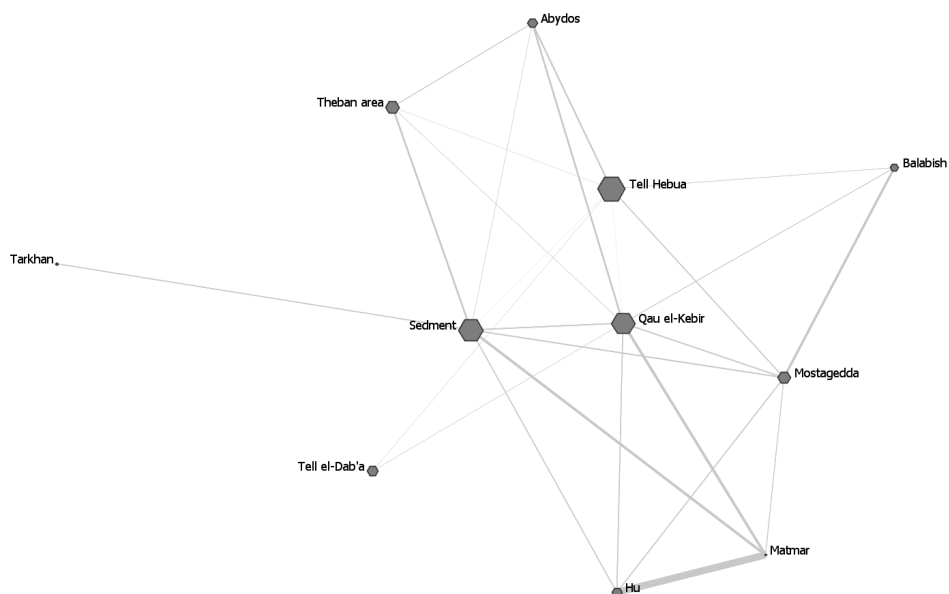


Figure 54: Closeness centrality of the second one-mode graph of the stone vessels during the LSIP.

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 though 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.