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

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7
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 spot[12]. 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 Milte 1901; Peet 1914; Randall-MacIver, Mace, and Griffith 1902.

17 This differentiation is not found in Nai'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, Soukiassian, 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.

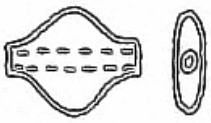
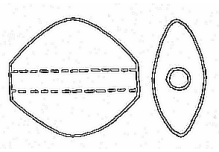
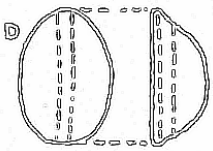
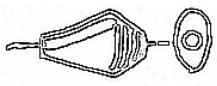
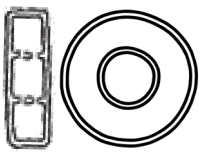
Finally, the quality of the published material does not always allow me to retrieve the data necessary for the analysis, namely the shape, the material, the colour, and the context of the beads. Especially in the older publications, the beads are not always reported in detail, but only the material or 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.

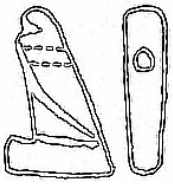
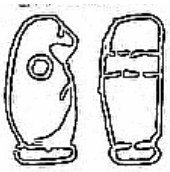
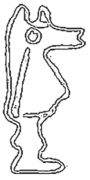
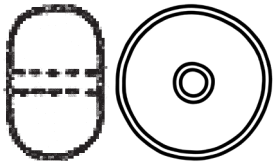
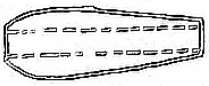
23 As for example in: Brunton 1948; Brunton, Gardiner, and Petrie 1930; Brunton and Morant 1937; Downes 1974; Engelbach and Gunn 1923.

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.

Name	*Description*	*Outline*
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)

Name	*Description*	*Outline*
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)

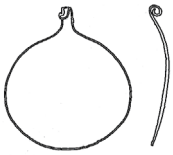
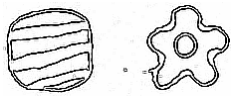
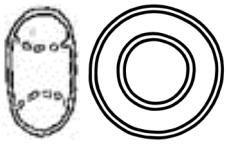
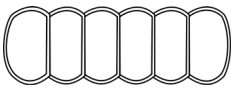
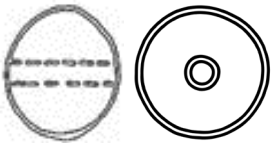
Name	*Description*	*Outline*
Mussel-shaped	Shaped like a mussel shell, with perforation or small loop on the top to be strung or hanged.	
Ribbed	Shaped like a ribbed spheroid, with indentations. The perforation is thin and runs in the centre of the spheroid.	
Ring	Shaped like a ring, with a large perforation 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 Kingdom[26] with beads (Table 7 in Appendix I; Appendix VI), Harageh[27] 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 Lisht[29] 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 Lahun[36] 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.

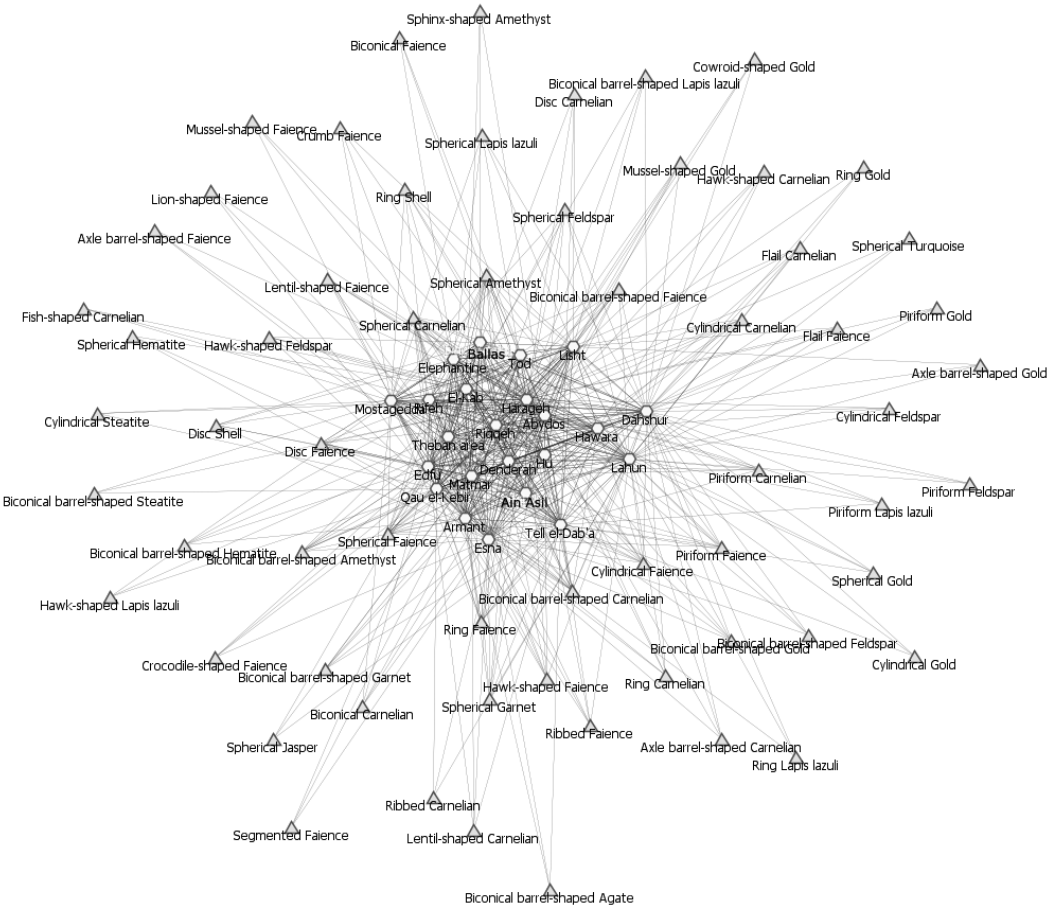


Figure 1: Contexts of the Late Middle Kingdom and the most common beads.

ment during that phase,[47] come only from tombs. This is because data from other types of contexts are not available yet.

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

47 Bietak 1985; Bietak 1996; Bietak 1997.
48 Brunton, Gardiner, and Petrie 1930, 1–3, pls. II and IV.
49 Ayrton et al. 1904, 19, 47–48; Garstang, Newberry, and Milte 1901; Peet 1914, 54; Peet and Loat 1913, 24–28; Randall-MacIver, Mace, and Griffith 1902, 55.
50 Engelbach et al. 1915, 13–14 and pls. XL–XLIII.
51 Brunton 1948, 54–56, pls. XLIII and LXXIII.
52 Brunton and Morant 1937, 113–114 and pl. LXXI.
53 Bourriau 2009, 54, 56, and 59; Petrie and Mace 1901, 42–44.
54 Petrie and Griffith 1900, 25–26.
55 Bruyère et al. 1938, 133–34; Michałowski et al. 1939, 31–33, 126, 130–31; Michałowski et al. 1950, 183–84, 312.

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.

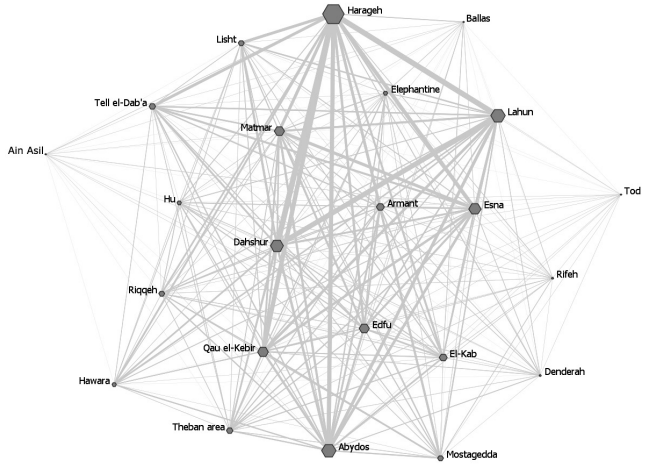


Figure 2: Degree centrality of the first one-mode graph of the beads during the LMK.

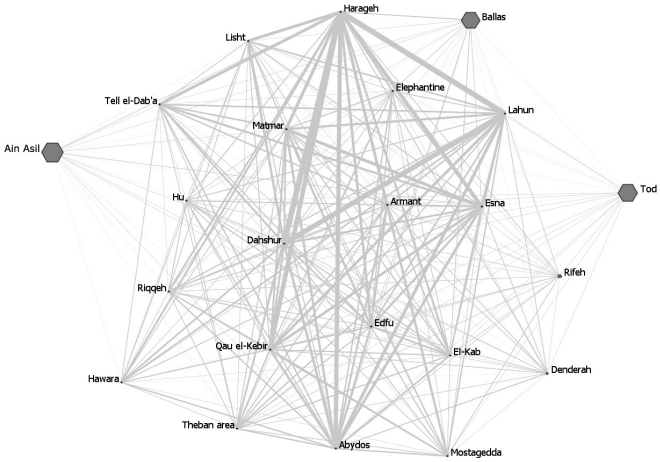


Figure 3: Betweenness centrality of the first one-mode graph of the beads during the LMK.

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

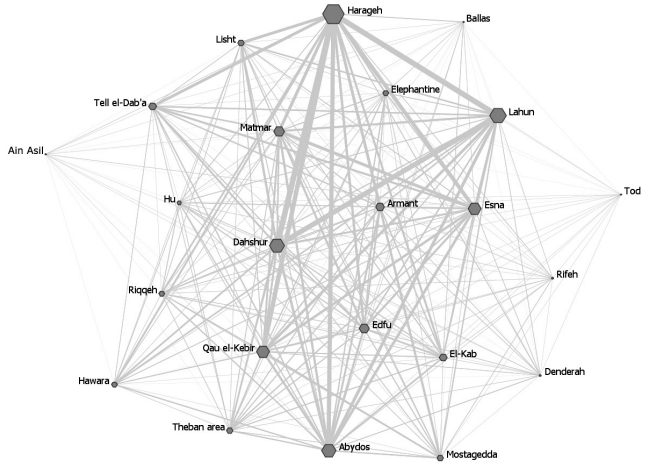


Figure 4: Eigenvector centrality of the first one-mode graph of the beads during the LMK.

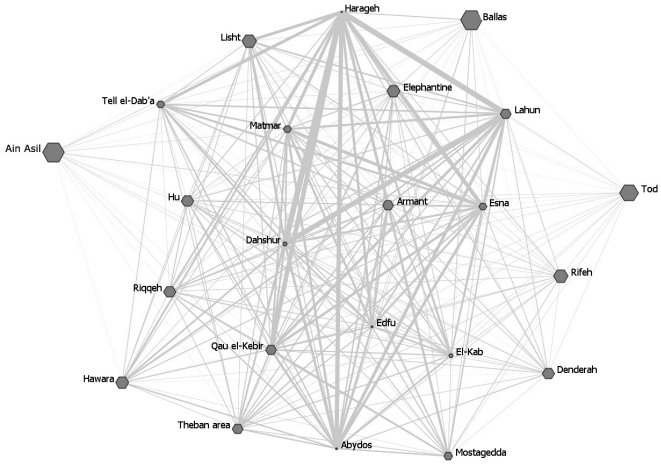


Figure 5: Closeness centrality of the first one-mode graph of the beads during the LMK.

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

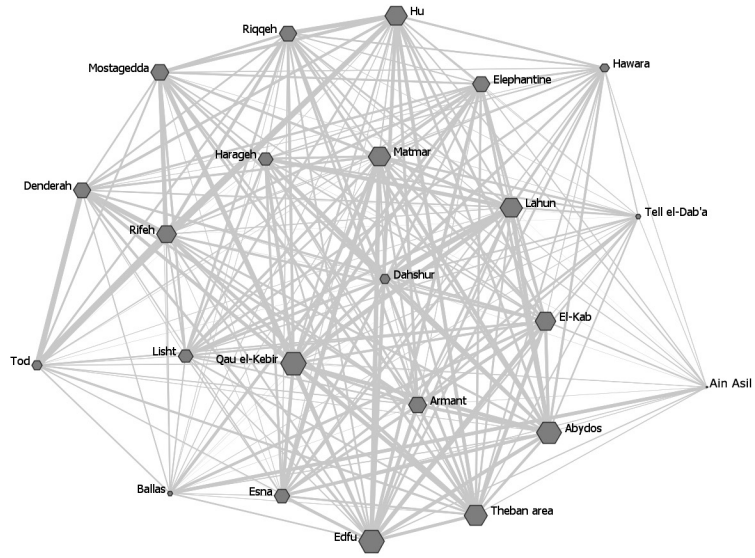


Figure 6: Degree centrality of the second one-mode graph of the beads during the LMK.

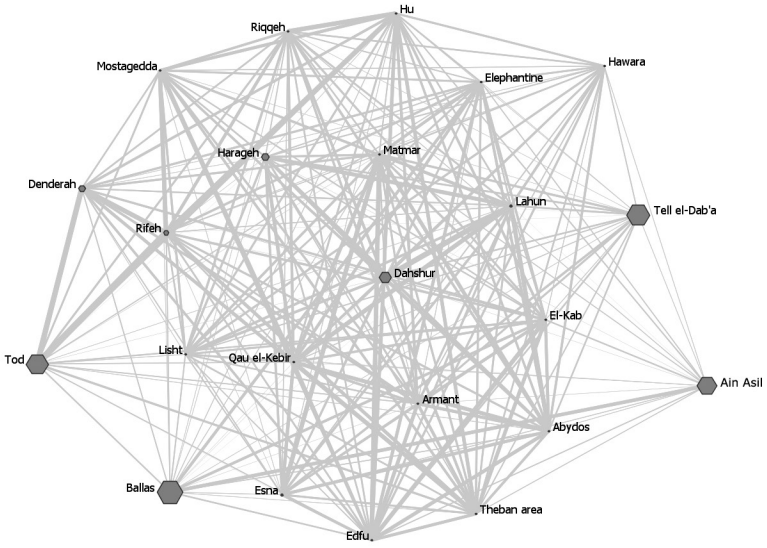


Figure 7: Betweenness centrality of the second one-mode graph of the beads during the LMK.

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.

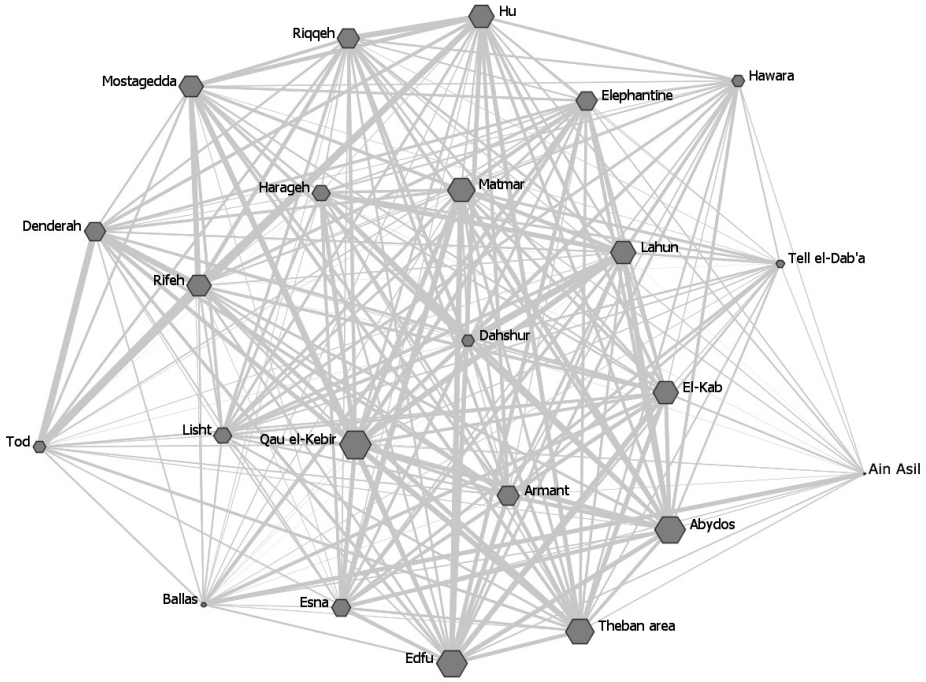


Figure 8: Eigenvector centrality of the second one-mode graph of the beads during the LMK.

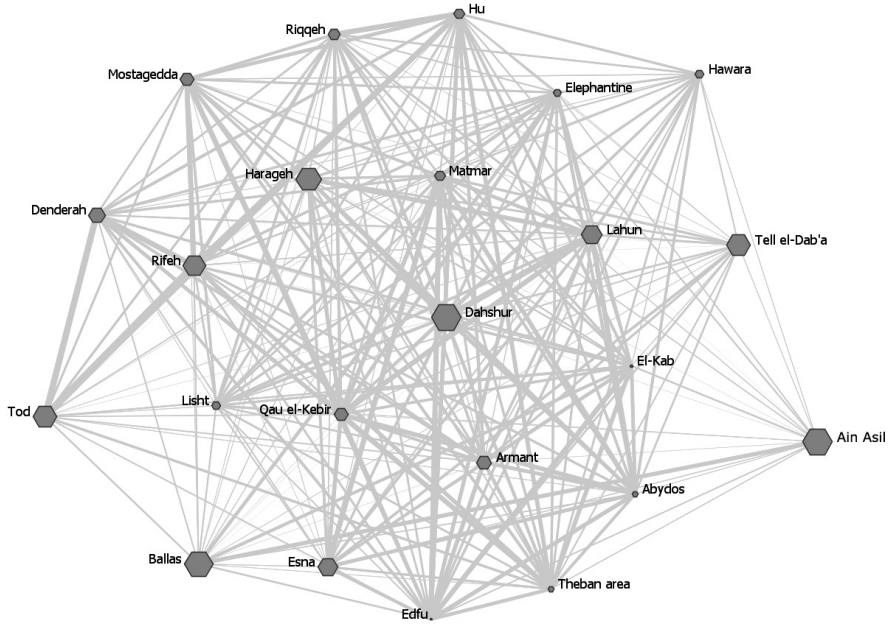


Figure 9: Closeness centrality of the second one-mode graph of the beads during the LMK.

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 Egypt[58] 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 Gjesfjeld 2015; Rivers, Knappett, and Evans 2013.
58 Marchand, Soukiassian, and Bourriau 2010, 139–41.

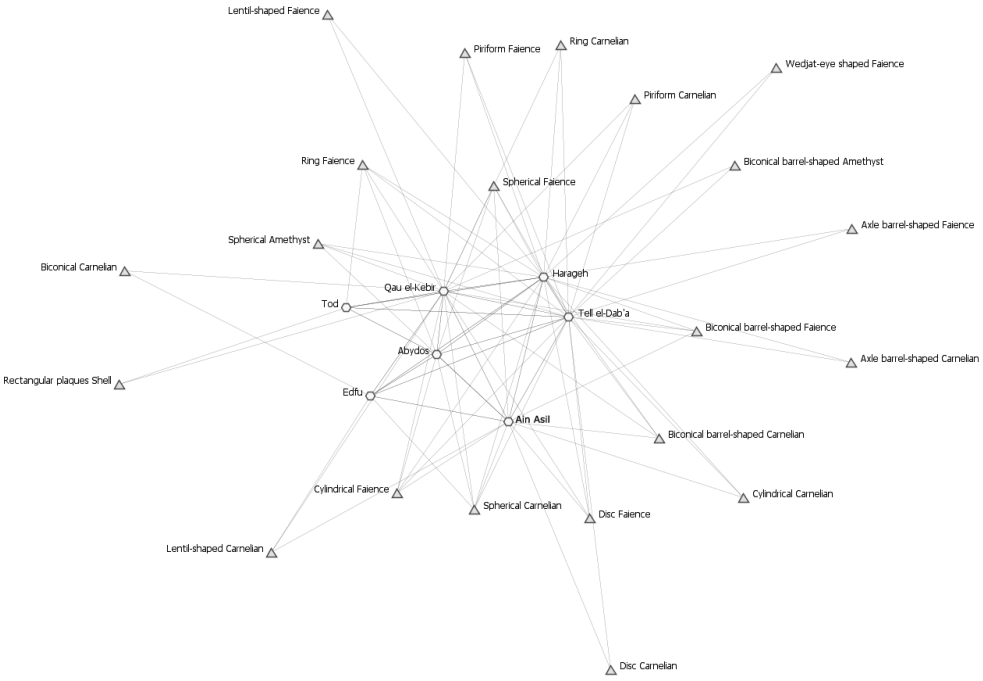


Figure 10: Contexts of the Early Second Intermediate Period and the most common beads.

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-Kebir[60] 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'a[61] and Harageh[62] 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, 111–15.
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'a[65] 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'a[67] is noticeable because it is the only site where beads of gold have been found. Lastly, Tod[68] and Qau el-Kebir[69] 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 Abydos[71] and Qau el-Kebir[72] 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.

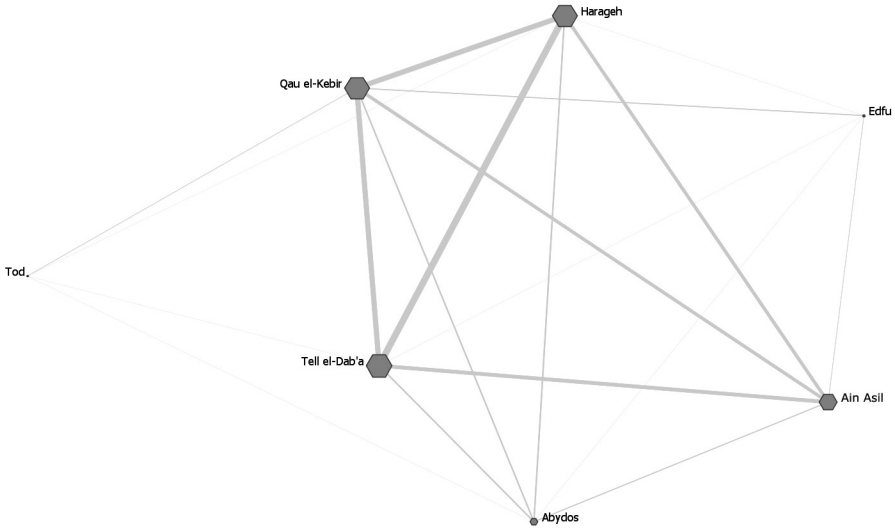


Figure 11: Degree centrality of the first one-mode graph of the beads during the ESIP.

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 research[77] 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.

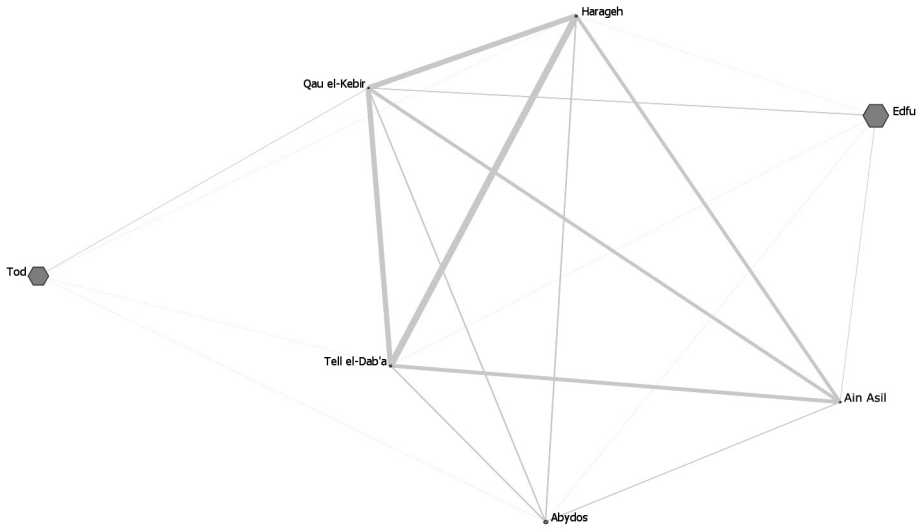


Figure 12: Betweenness centrality of the first one-mode graph of the beads during the ESIP.

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,

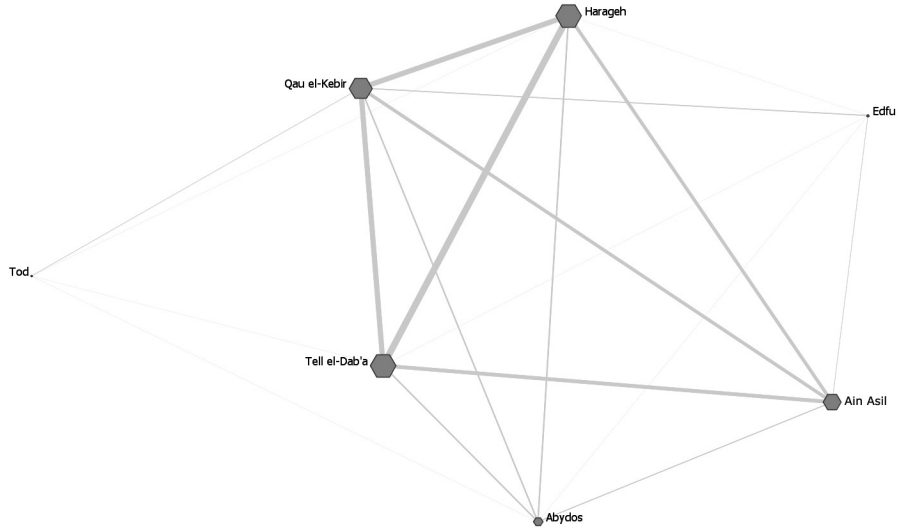


Figure 13: Eigenvector centrality of the first one-mode graph of the beads during the ESIP.

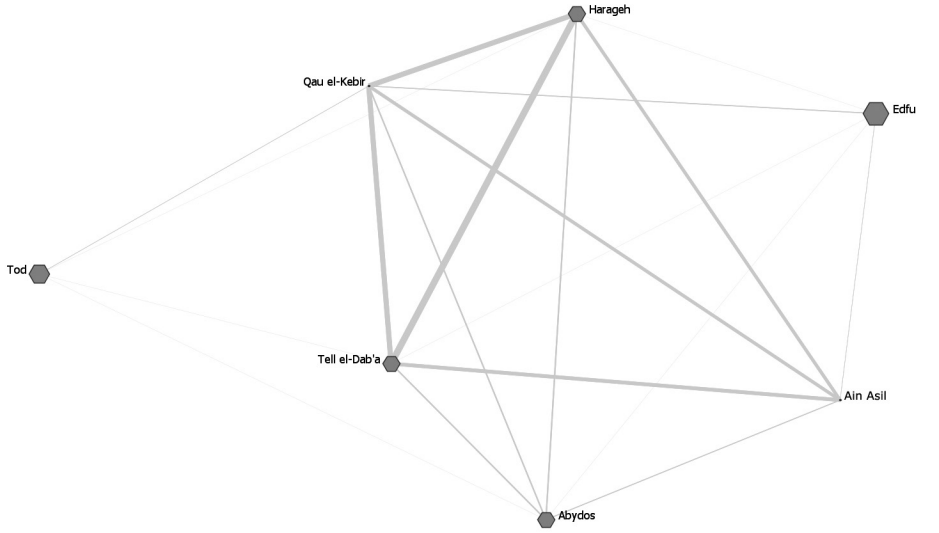


Figure 14: Closeness centrality of the first one-mode graph of the beads during the ESIP.

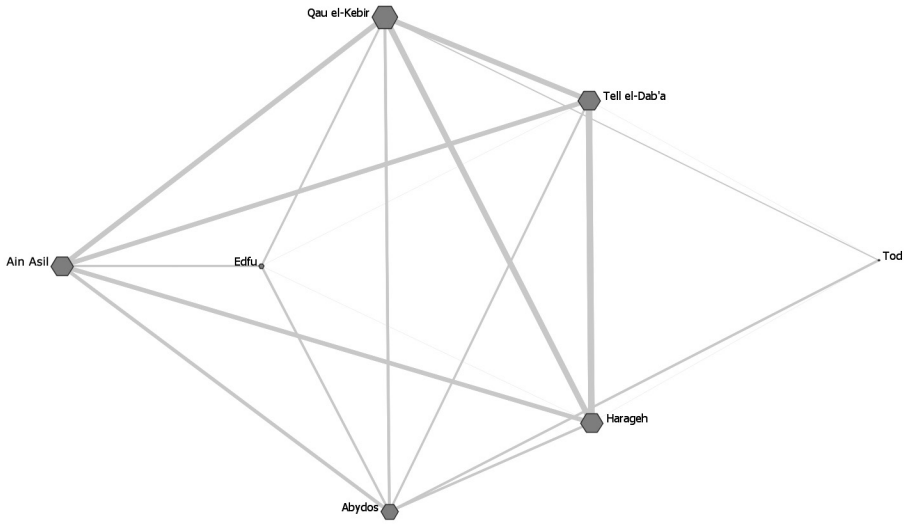


Figure 15: Degree centrality of the second one-mode graph of the beads during the ESIP.

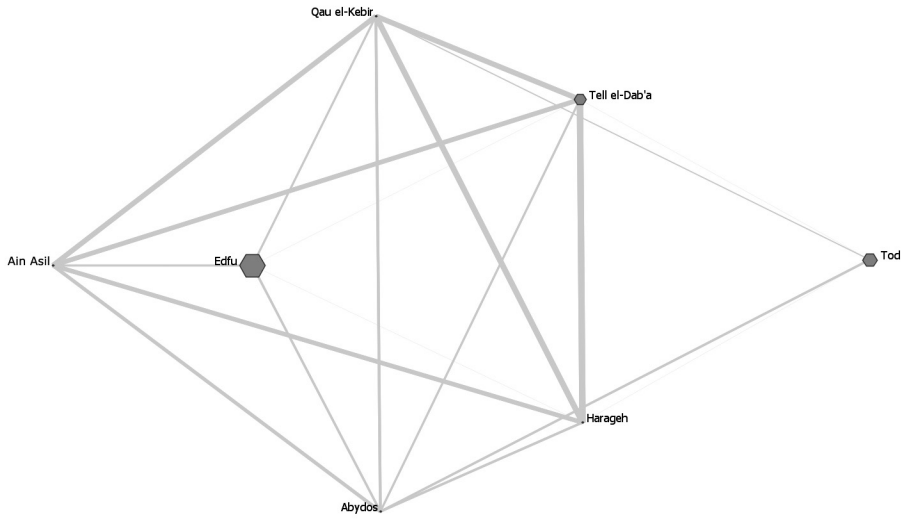


Figure 16: Betweenness centrality of the second one-mode graph of the beads during the ESIP.

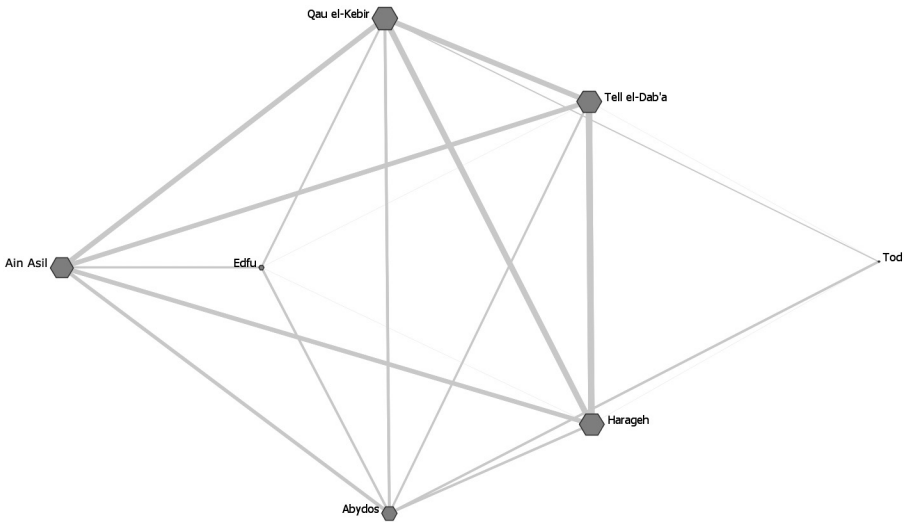


Figure 17: Eigenvector centrality of the second one-mode graph of the beads during the ESIP.

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.

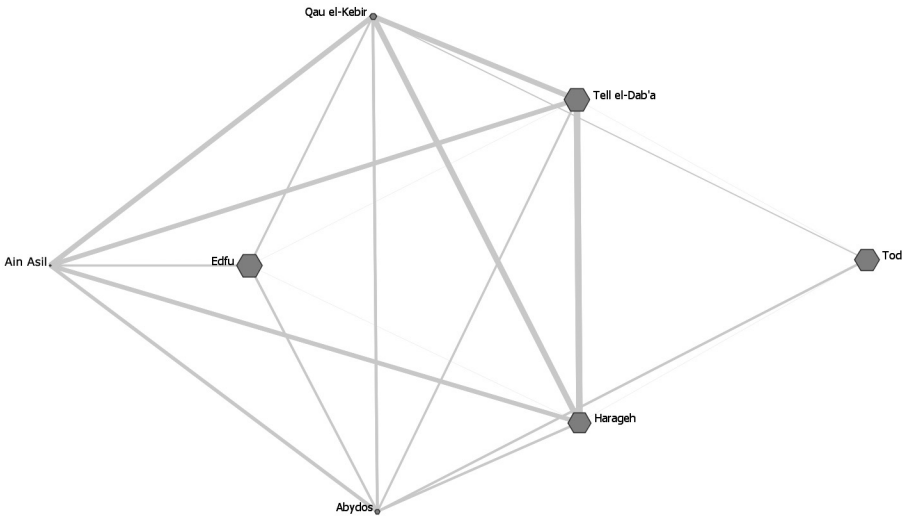


Figure 18: Closeness centrality of the second one-mode graph of the beads during the ESIP.

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 Gjesfjeld 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,

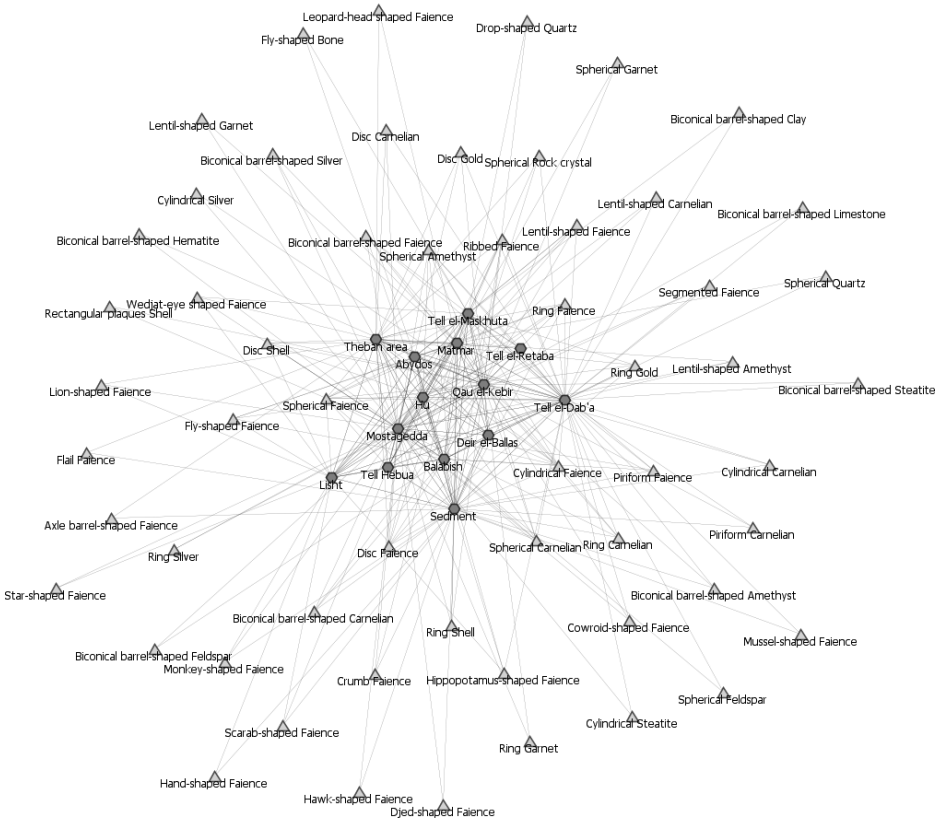


Figure 19: Contexts of the Late Second Intermediate Period and the most common beads.

Tell el-Retaba,[84] Tell el-Maskhuta,[85] Sedment,[86] Tarkhan,[87] Balabish,[88] Tell Hebua),[89] and sites that were analysed also for both previous phases (i.e. Tell el-Dab'a,[90] Abydos),[91] as well as sites that were included in the analysis of the Late Middle Kingdom, but not of the Early Second Intermediate Period (i.e.

111–15.

84 Rzepka et al. 2014, 39–46.

85 Redmount 1989.

86 Petrie and Brunton 1924, 16–20 and pls. XLVI–XLVII.

87 Petrie 1914, 12.

88 Wainwright and Whittemore 1920, 8–16 and 19–23, pls. VIII and XVI–XVII.

89 Maksoud 1998, 261.

90 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.

91 Bourriau 1981a, 33; Garstang, Newberry, and Milte 1901; Peet 1914, 62–64; Randall-MacIver, Mace, and Griffith 1902, 101.

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 Balabish[107] 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 Esna[110] 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 Hebua[114] 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.

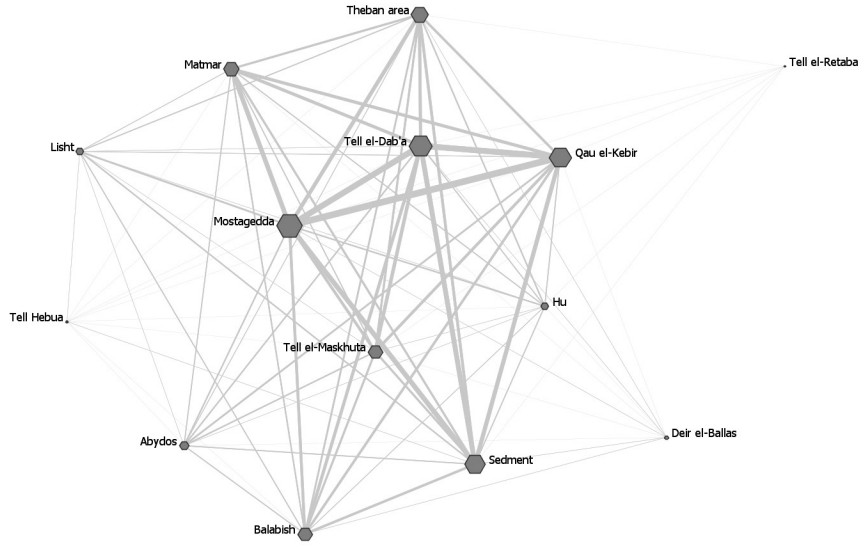


Figure 20: Degree centrality of the first one-mode graph of the beads during the LSIP.

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 area[117] have the most variety of types, when the proportion between the number of contexts and the types of beads is considered. On the contrary, Mostagedda[118] and Balabish[119] 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 Whittemore 1920, 8–16 and 19–23, pls. VIII and XVI–XVII.

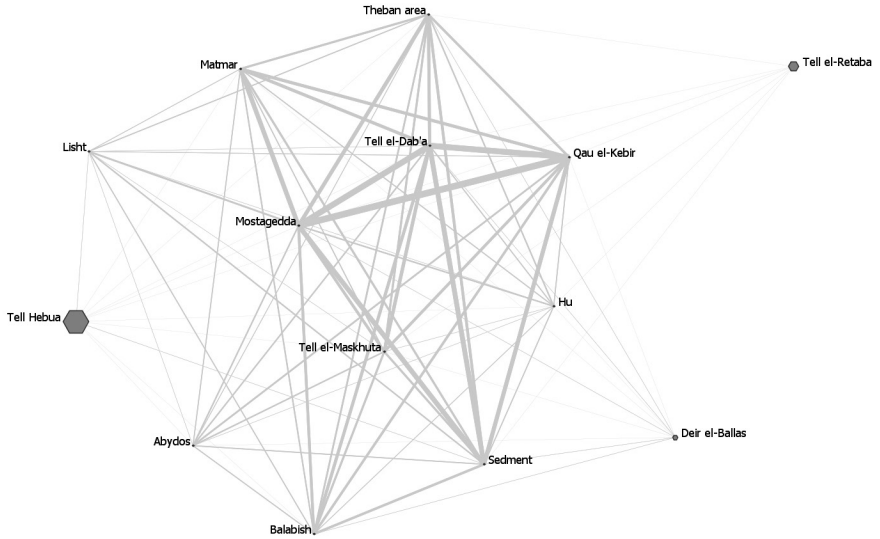


Figure 21: Betweenness centrality of the first one-mode graph of the beads during the LSIP.

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-Retaba[122] 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.

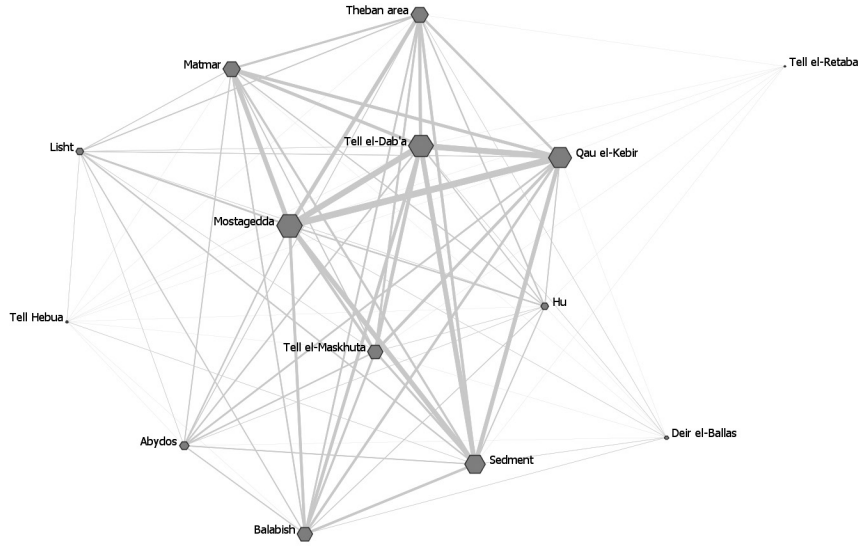


Figure 22: Eigenvector centrality of the first one-mode graph of the beads during the LSIP.

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-Kebir, 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

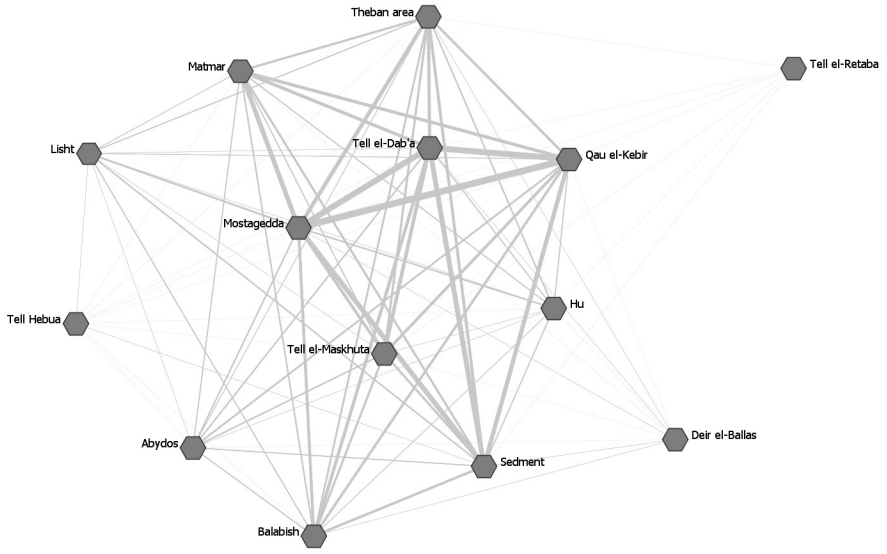


Figure 23: Closeness centrality of the first one-mode graph of the beads during the LSIP.

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.

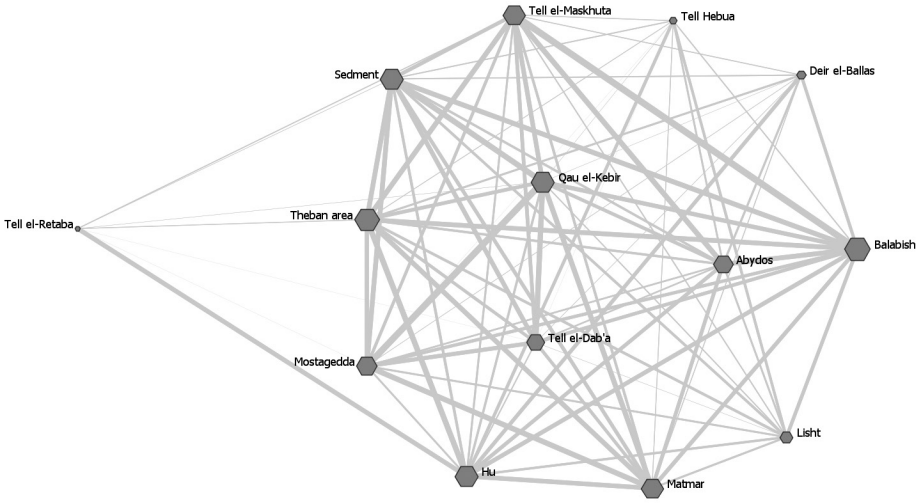


Figure 24: Degree centrality of the second one-mode graph of the beads during the LSIP.

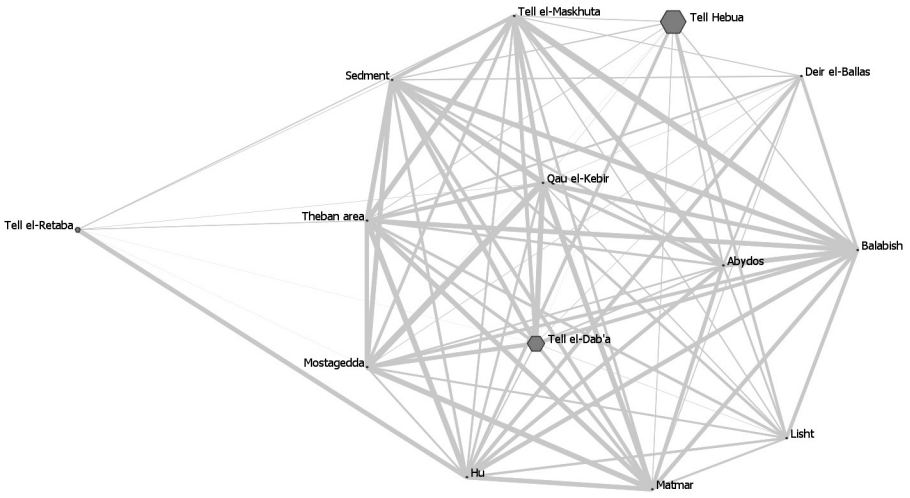


Figure 25: Betweenness centrality of the second one-mode graph of the beads during the LSIP.

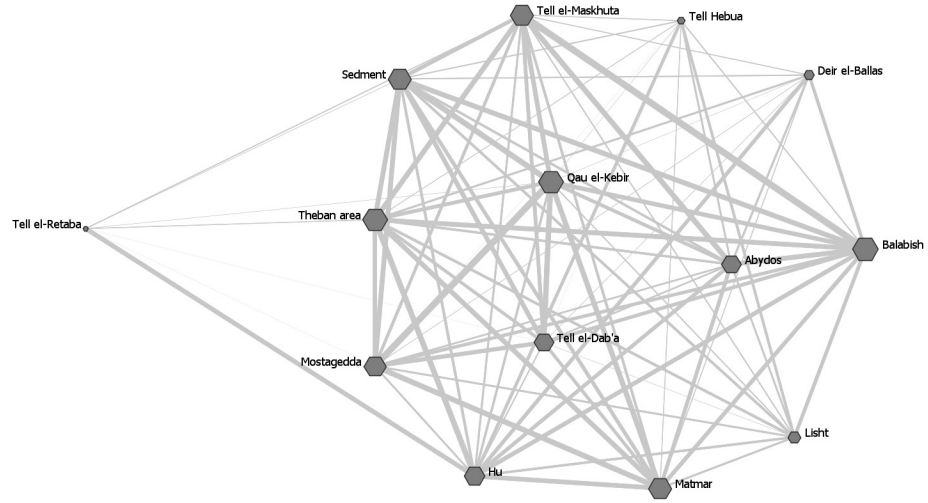


Figure 26: Eigenvector centrality of the second one-mode graph of the beads during the LSIP.

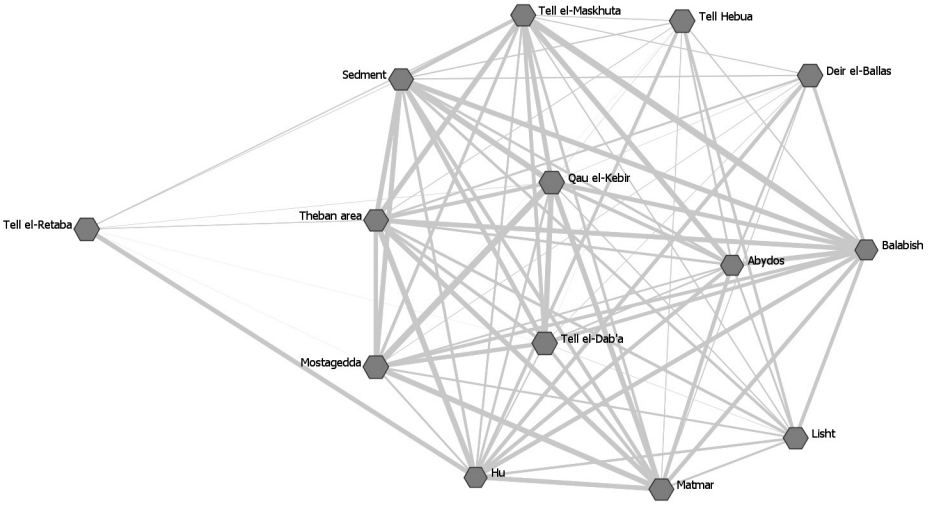


Figure 27: Closeness centrality of the second one-mode graph of the beads during the LSIP.

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 Gjesfjeld 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 form 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.