



Analysing the Dynamics among the Social Groups and the Mechanisms of Social Promotion in the Provinces in the late Old Kingdom: SNA Methods and New Research Approaches

Emilie Martinet

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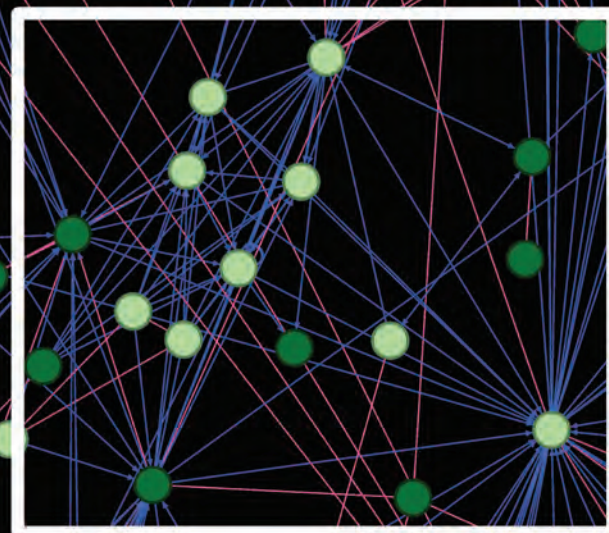
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ADDRESSING THE DYNAMICS OF CHANGE IN ANCIENT EGYPT: COMPLEX NETWORK ANALYSIS

Veronika Dulíková and Miroslav Bárta, eds.

Charles University
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Keywords: Complex societies – Ancient Egypt – Old Kingdom – punctuated equilibrium – social status race – Abusir and Saqqara – Fifth Dynasty – tomb of Ty – nepotism – Nyuserre

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in analysing relationships that can be modelled by graph theory are now widely developed within the framework of complex network analysis. To emphasize the increasing rate of application of these scientific methods to cover new challenges in processing ancient Egyptian data, the concept of cyber-Egyptology has been introduced recently. Cyber-Egyptology deals with the interpretation of ancient Egyptian data and Egyptologists' observations using techniques based on the principles of cybernetics, artificial intelligence, and complex network analysis that might be modified to cope with a limited amount of complex structures containing uncertainties and missing entries. We offer an overview of a selected set of such methods and their application to Old Kingdom data.

Keywords: Old Kingdom – complex network analysis (CNA) – cyber-Egyptology – artificial intelligence – administration – titulary – society

Émilie Martinet

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Keywords: networks – elites – Old Kingdom – social promotion – provinces

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Abstract: Although the scientific discussion about the site and its monuments forms an independent research focus, the archaeological legacy of the Memphite necropolis of the second millennium BC remained uninvestigated for a very long time. The Memphite elite tombs of the New Kingdom (1539–1077 BC), which have been discovered and excavated during the past 45 years, eventually revealed much prosopographical data. Relevant texts and inscriptions are to be found not only on the walls of the tombs but also on different types of objects that were part of the tombs' original equipment or decoration (e.g. coffins, stelae, statues, canopic jars, shabtis and decorated limestone blocks). By evaluating and comparing all prosopographical data, the Prosopographia Memphitica Project aims to attain a Memphite prosopography for the New Kingdom, which is intended to illuminate all identifiable social classes of the Memphite society and its relational patterns using historical network analysis.

Keywords: prosopography – Memphis – Saqqara – New Kingdom – historical network analysis

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Keywords: New Kingdom – Upper Egypt – Ameneminet – Amenemipet – power – centrality – Court – court society – elite – priesthood

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Abstract: This paper presents the history of Trismegistos Networks (www.trismegistos.org/network), a section of the Trismegistos platform that was designed with a twofold purpose: to make available interactive graphs of networks created for scientific papers, and to visualize relations between entries in the ever-expanding

Trismegistos databases. At first, TM Networks used the SigmaExporter plugin developed for Gephi, but since Trismegistos is constantly evolving, a live solution was needed. We therefore developed the TOMATILLO, the Trismegistos Online spaghettiMonster visualization Tool-illo (www.trismegistos.org/network/tomatillo-demo), which is not only designed to pull data from Trismegistos directly but also offers more advanced filtering options to allow for more user interactivity. *Keywords:* network visualizations – online publication – user interactivity – Graeco-Roman Egypt

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Abstract: The Ptolemaic military camp of Pathyris, established around 165 BC, has generated a rich body of written sources that reveal detailed information about the inhabitants and their socio-economic activities and relationships. Because the site was abandoned in the autumn of 88 BC, a large number of texts that are unlikely to survive continuous habitation has come down to us. Therefore, the Pathyrite community can be studied in detail through roughly three generations.

The paper introduces the author’s doctoral research and discusses the applicability of formal social network analysis (SNA) to ancient archive studies. The community can be meaningfully studied in the form of social networks through systematic documentation and analysis of prosopographical, attribute and relational data revealed by 427 Greek and Demotic documents associated with 21 ancient archives. *Keywords:* Pathyris – social network analysis (SNA) – Gephi 0.9.2 – ancient archives – Ptolemaic Egypt

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Foreword

Many paths open for those who are taken by Egyptology. The most likely one may be through the monumental pyramids of Giza, Abusir, Saqqara or Dahshur, the magnificent temple complexes of Luxor and Karnak or via ancient Egyptian religion as conveyed in various texts, reliefs and paintings. One's attention may be captured by the statues of gods, kings, queens and high officials or by dozens of lavishly decorated tombs. Another possible way leads through the charming landscape of the River Nile and the miracles of the Western Desert, the mountains and Biblical stories of the Sinai Peninsula or the delight of endless hieroglyphic, hieratic or demotic texts.

Future Egyptologists may also pursue a more specific trajectory – and study ancient Egyptians themselves. Individual destinies are reflected in genuine texts, while tombs and artefacts provide a unique testimony to human agency and to the particular role of an individual in history, ancient or modern. Yes, even the Step Pyramid of Saqqara was devised by a real man, architect Imhotep, the complex of Khufu in Giza was probably built by his nephew Hemiunu, the art of tomb decoration in sunk relief was invented by Prince Nefermaat (the presumable father of Hemiunu), who was buried in Meidum. We know many leaders of Egyptian armies and expeditions such as famous Harkhuf, the chief advisor to Queen Hatshepsut, Senmut, and hundreds of others. We seem to understand better and better the reasons why Amenhotep IV / Akhnaten undertook an unparalleled reform of the state and institutionalised the religion of Aten. We may be familiar with the agency of the policies and politics of the priesthood during the Late Period in reaction to a continually rising influx of foreigners and foreign ideas into the land on the Nile. We can admire the wisdom and scope of knowledge of Iufaa, a priest of Sais buried in Abusir, whose extensive and unparalleled texts reveal new aspects of the ancient Egyptian belief system. Last but not least, it was famous Czech Egyptologist Jaroslav Černý who made the individual scribes and royal tomb builders, members of the Deir el-Medineh community active during the New Kingdom, known to the world. What can be more fascinating than travel back in time and try to understand the behaviour, mindsets and decisions made by excellent individuals whose ideas and deeds have survived millennia?

The present volume seeks to indicate novel methods and approaches to analysing and interpreting the agency of individual officials in different periods of ancient Egyptian history. Their activity and careers are observed using different methods of complex network analysis and put into a broader framework of more general trends operating the society at a given stage of its evolution. We are confident that this is one of the most promising and proven ways to gain deeper insights into day-to-day lives of the people of the past. The story of civilisations is above all

a story of ideas and thoughts, and social/complex network analysis is one of the most efficient tools we can use. It enables us to view known data anew and assess them from new perspectives that significantly expand and deepen our knowledge of the past civilisation.

In recent years, this research approach has evolved independently at several institutions exploring ancient Egypt. We were very pleased to host most of these scholars at a joint meeting and offer them an opportunity to present and communicate their individual approaches, methods, points of view and observations. The contributions in this volume, originally presented at a workshop in Prague in September 2018, cover selected periods of ancient Egypt (the Old Kingdom, the New Kingdom, the Greco-Roman Period). Nevertheless, the use of the methods of social/complex network analysis in Egyptology has developed on. In the meantime, this research approach has expanded to other periods of ancient Egyptian history. Daniela Stefanović used social network analysis tools to analyse the network of treasurers, high-ranking dignitaries in the Middle Kingdom and Second Intermediate Period: *The Social Network(s) of the Middle Kingdom and Second Intermediate Period Treasurers: Rehuerdjersen, Siese, Ikhernefret and Senebsumai*, *JEH* 12(2), 2019, pp. 259–287.

Cyber-Egyptology, a new area of research in Egyptology, appears to be a justified approach with its own methodology, philosophy and a vast potential to answer complex questions relating to this fascinating civilisation and its diachronic dynamics. Moreover, this method of cyber-research can be applied universally across most archaeological and historical specialisations.

Miroslav Bárta and Veronika Dulíková

Abbreviations

ÄA	Ägyptologische Abhandlungen
ACER	The Australian Centre for Egyptology: Reports
ÄF	Ägyptologische Forschungen
AJS	American Journal of Sociology
Ä&L	Ägypten und Levante
AnOr	Analecta Orientalia
ArOr	Archiv Orientální / Oriental Archive
ARSS	Actes de la recherche en sciences sociales
ARWAW	Abhandlungen der Rheinisch-Westfälischen Akademie der Wissenschaften
ASAE	Annales du Service des antiquités de l'Égypte
ASE	Archaeological Survey of Egypt
AV	Archäologische Veröffentlichungen
AUU	Acta Universitatis Upsaliensis
BACE	Bulletin of the Australian Centre of Egyptology
BAR	British Archaeological Reports
BASP	Bulletin of the American Society of Papyrologists
Bayesian Anal.	Bayesian Analysis
BdÉ	Bibliothèque d'Étude
BEM	Bulletin of the Egyptian Museum
BIFAO	Bulletin de l'Institut français d'archéologie orientale
BoSAe	Bonner Sammlung von Aegyptiaca
BSFE	Bulletin de la Société Française d'Égyptologie
BSGA	Blackwell Studies in Global Archaeology
CASAE	Cahier no. ... Supplément aux Annales du Service des Antiquités de l'Égypte
CCIS	Communications in Computer and Information Science
CdE	Chronique d'Égypte
CENiM	Cahiers Égypte nilotique et méditerranéenne
CGC	Catalogue général des antiquités égyptiennes du Musée du Caire
CHANE	Culture and History of the Ancient Near East
CollHell	Collectanea Hellenistica
CRIPeL	Cahier de recherches de l'Institut de papyrologie et égyptologie de Lille
CTHS	Comité des travaux historiques et scientifiques
DHA	Dialogues d'histoire ancienne
EA	Egyptian Archaeology
EAO	Égypte, Afrique & Orient

EDAL	Egyptian and Egyptological Documents, Archives and Libraries
EM	Excavation Memoir
GM	Göttinger Miszellen
GOF	Göttinger Orientforschungen Ägypten
GRBS	Greek, Roman and Byzantine Studies
HdO	Handbuch der Orientalistik
IJPA	International Journal of Public Administration
JAMT	Journal of Archaeological Method and Theory
JARCE	Journal of American Research Center in Egypt
JASP	Journal of Abnormal and Social Psychology
JcoptStud	Journal of Coptic Studies
JCSS	Journal of Computer and System Sciences
JdE	Journal d'Entrée du musée du Caire
JEA	Journal of Egyptian Archaeology
JEOL	Jaarbericht van het Vooraziatisch-Egyptisch Genootschap (Gezelschap) "Ex Oriente Lux"
JEH	Journal of Egyptian History
JNES	Journal of Near Eastern Studies
KSG	Königtum, Staat und Gesellschaft früher Hochkulturen
LÄ	Lexikon der Ägyptologie
LNCS	Lecture Notes in Computer Science
MAJA	Münchner Arbeitskreises Junge Ägyptologie
MÄU	Münchner Ägyptologische Untersuchungen
MDAIK	Mitteilungen des Deutschen Archäologischen Instituts, Abteilung Kairo
MIFAO	Mémoires publiés par les membres de l'Institut français d'archéologie orientale
MOA	Monografías del Oriente Antiguo
NeHet	NeHet. Revue numérique d'Égyptologie
NKMN	The New Kingdom Memphis Newsletter
OBO	Orbis Biblicus et Orientalis
OIS	Oriental Institute Seminar
OLA	Orientalia Lovaniensia Analecta
OMRO	Oudheidkundige Mededelingen uit het Rijksmuseum van Oudheden
Or	Orientalia
OrMon	Orientalia Monspeliensia
PALMA	Papers on Archaeology of the Leiden Museum of Antiquities
PAM	Polish Archaeology in the Mediterranean
PdÄ	Probleme der Ägyptologie
PES	Pražské egyptologické studie / Prague Egyptological Studies
P.L.Bat.	Papyrologica Lugduno-Batava
PM	Porter, B. – Moss, R. L. B., <i>Topographical Bibliography of Ancient Egyptian Hieroglyphic Texts, Reliefs and Paintings</i> , I–VII, London 1927–1951.

PNAS	Proceedings of the National Academy of Sciences
QASS	Quantitative Applications in the Social Sciences
RdE	Revue d'égyptologie
SAGA	Studien zur Archäologie und Geschichte Altägyptens
SEP	Studi di Egittologia e di Papirologia
SHAW	Schriften der Heidelberger Akademie der Wissenschaften
Stud.Hellen.	Studia Hellenistica
TM	Trismegistos
TMO	Travaux de la Maison de l'Orient et de la Méditerranée
USAMNEC	Uppsala Studies in Ancient Mediterranean and Near Eastern Civilizations
UTB	Uni-Taschenbücher
VMPG	Veröffentlichungen des Max-Planck-Instituts für Geschichte
ZÄS	Zeitschrift für Ägyptische Sprache und Altertumskunde

Editorial notes

Most contributions in this volume are based on analysis of data contained in the particular databases that use specific transliteration styles of hieroglyphic writing influenced by the linguistic schools in the given regions. The same transliteration styles are also used in the graphs and visualisations. For these technical reasons, we have decided not to unify them into a single fashion.

Analysing the dynamics among the social groups and the mechanisms of social promotion in the provinces in the late Old Kingdom: SNA Methods and new research approaches

Émilie Martinet

Introduction

Some social transformations are discernible in Egyptian society from the end of the Old Kingdom. The late Old Kingdom and the First Intermediate Period are marked by an increase in the highest rank titles, which were given to a broader group of officials (Grajetzki 2001: 161, 167). I have also shown that the very end of the Old Kingdom was characterised by a greater stratification of higher elites by revealing the spread of a specific title string beginning with the title *jt ntr*, “god’s father” indicating the very elevated status of Coptite high-ranking officials towards the end of the Eighth Dynasty, correlated with their increasing wealth arising from the control of the temple of Min, their links with the royal family as well as the acquisition of the highest rank titles by more numerous individuals and the necessity to distinguish the Coptite elite (Martinet *forthcoming*). Furthermore, it is also important to add that Egyptian society as a whole became more heterogeneous in the late third millennium BC (Campagno 2014: 19–24; Richards 2005: 15, 173), the presence of “couches sociales intermédiaires” being noticeable from the late Old Kingdom (Richards 2005: 173–180; Campagno 2014: 19; Mazé 2017: 123–175).

In this context of social transformations within the whole of society (see also Moreno García 2005: 215–228; 2016: 491–512), social mobility and hierarchy are crucial issues, and even more so in the provinces, which were marked by an increase in the number of titled individuals, especially from the second part of the Sixth Dynasty. However, the multifactorial process of social promotion of provincial officials in the late Old Kingdom is not easy to perceive, in particular due to the scarcity and nature of the sources. Although royal decrees and biographical inscriptions provide information concerning the promotion of a few provincial families to a higher status by the monarchy, we lack details of the precise conditions that led to an elevation in society and the acquisition of the highest rank titles.

By analysing the structures and dynamics of the social groups around the tomb owner represented in his tomb,¹ it is also possible to perceive some of the

¹ For a general overview of the functions of the subordinates who were named and represented in the tombs of the upper elites, see Seyfried 2003: 41–59. For a recent analysis of the “couches sociales intermédiaires” and the identification and the different duties of the individuals who belonged to this category, see more recently Mazé 2017: 123–175. For the existence of a “middle class” in the Middle Kingdom and in the New Kingdom, see Vermeulen 2016: 139–165.

mechanisms of social mobility. The visual representation of social networks using the Gephi software will help to reach a more detailed comprehension not only of the hierarchy of the household but also of the relationships between and within the social groups, especially by connecting people who shared the same responsibilities and were involved in similar institutions. John Baines (2009–2010: 134) has underlined the role of these individuals of middle or lower ranks whom he describes as sub-elites. They played an intermediary role between the elites and the rest of society and were “at the centre of webs of interdependence”, some of them being “essential for maintaining the high-cultural tradition” (Baines 2009–2010: 134). It is indeed very interesting to apply the SNA methods to households, which were basic units of social organisation, and “were frequently multifaceted social networks embracing other relatives, serfs, clients, subordinates, and dependants”, besides the nuclear families (Moreno García 2012: 1, 3; see also Bárta 2013: 275; Moreno García 2013: 1050). This kind of topic is all the more important given that the Egyptian state “operated as an extended household-of-households” (Lehner 2000: 280).² This ongoing research builds on an exhaustive database in which I have recorded all titled individuals known in the provinces (approximately 1500 persons), except for officials known only from graffiti and who seem to have not been present in the provinces permanently (Martinet 2019b: 669–1025).

In very recent years, social network methods started to be applied to Egyptian society with promising results. Amongst these studies, those related to my topic are ones like the new approach based on complex network analysis applied to the Memphite society of the Old Kingdom by Veronika Dulíková, who works in close collaboration with the Czech Technical University in Prague (Dulíková – Mařík 2017: 63–80), as well as the work of Vincent Chollier, who underlines the difficulties in applying social network methods to Egyptian society. He provides some methodological solutions within his case study focused on the provincial elites of the New Kingdom (Chollier 2014: 57–72).

In the first part of this paper, I shall discuss the benefits and limitations of the application of SNA methods to the networks of family members and subordinates who are represented in the tombs of the elites. I shall also present some elements of my approach to the socio-administrative structures in the provinces. The second part of this paper is focused on the case study of Pepyankhheryib (14th nome of Upper Egypt), the description of the methodology I have chosen and the interpretation of the data. This part is supplemented by archaeological and material data concerning the cemetery of Meir in order to provide additional information about the middle- and low-ranking officials of Pepyankhheryib’s network and their possible burial place.

² Concerning the patrimonial household model (PHM) applied to Near East Bronze Age societies, see Schloen (2001: 50–52), who relies on M. Weber’s ideal type of “patrimonialism”.

Application of social network analysis to networks of family members and subordinates represented in the tombs of high-ranking officials

The iconographical data and records coming from the tombs convey “social hierarchy overtly” (Baines 2013: 237–238; Richards 2005: 21). The aim of these depictions was to represent a two-tiered world divided between high officials and their subordinates. However, it is necessary to be cautious with the interpretation of the data insofar as it is not a direct source for analysing social dynamics and are partial (Moreno García 2003: 92–95; Chollier 2014: 57). Indeed, it does not provide all social links the tomb owner had established during his life. As the most important person in these networks is the head of the household, the relationships between his subordinates are quite often not indicated (Martinet 2016b: 17–21). Furthermore, this kind of data does not reveal all the aspects of the hierarchy. For example, the scarce acquisition of the highest rank-indicator *jrj-pꜣt* in the 1st nome of Upper Egypt, which is nevertheless well documented with about three hundred titled individuals known for the Old Kingdom, does not mean that the highest officials from Elephantine did not obtain a significant influence, especially at the local level (Martinet 2019a: 268 and n. 83). If rank titles covered part of the reality, they cannot completely reveal all the features of the hierarchy which was also based on informal aspects.³

Insofar as the written sources and depictions were produced by the elites and addressed to them, the material culture as well as the sociology of the necropolis and the tombs seem to be a better way to study the social stratification and the relationships between social groups (Baines 2009–2010: 118; Grajetzki 2010: 183; Frood 2010: 470).⁴ Nevertheless, even though the written sources and iconographical representations in the tombs do not reveal the “true” organisation of society (Vasiljević 2012: 139), the ideal or ideological conceptions and representations they convey concerning the social order as viewed by the elites are culturally true (Seidlmayer 2001: 206; Frood 2010: 470; see also recently Auenmüller 2018: 15–41) and also provide information concerning the codes of the self-presentation of the elites. In addition, concerning the categorisation of individuals by the central power and the “‘discrepancy’ between ideology and reality”, Katalin Anna Kóthay (2013: 479) observes that the “government’s biased, simplified view of a more complex social world [...] itself contributes to reality”, something which may also be applied to the provincial elites and the local communities they controlled. The analysis of the iconographical programmes of the tombs of Qubbet el-Hawa by Deborah Vischak, for which this author has shown and explained the practice of some flexibility compared to those in other provinces – these programmes being characterised by their unique nature and a great accuracy concerning the networks of patronage – provides an interesting example of what that kind of data can reveal about the fact

³ Cf. the remarks of Stephen Quirke (2004: 4–5) and also Harco Willems (2014: 53–54).

⁴ For an analysis of the sociology of the necropolises and the tombs in the 1st nome of Upper Egypt, see Seidlmayer 2001: 205–252, 2003: 60–74; El-Din 1994: 31–34. For social aspects of the evolution of tomb architecture in the provinces and funerary equipment between the late Old Kingdom and the early Middle Kingdom with regional variations, see Seidlmayer 1990: 398–442.

that these members recognised themselves as a community, as well as about the relationship between the members of the local community and the place where they lived (Vischak 2007: 449–450; 2015: 17, 179–223).

My database contains not only high-ranking provincial officials but also all the social groups around them, including members of their extended family and their subordinates represented in their tombs. For each titled individual known in the provinces, I recorded the members of the kinship group as well as the dependants, with their own titles (if they had any) and relationships. At first, I studied these networks in a qualitative and manual way. In fact, the size and composition of the households correspond to criterion 18 in my list of twenty-two criteria that allowed me to develop a typology of the provincial administrative structures in my PhD dissertation dedicated to the provincial administration in the Old Kingdom (Martinet 2019: 509–538). Criterion 18 is based on the number of family members and subordinates who are represented in each provincial tomb dating to the Old Kingdom as well as on the profile of the members of these networks according to their main duties. In the 14th nome of Upper Egypt, about 30% of titled individuals represented in the network of Pepyankhheryib were tied to the state administration and/or the Court (Martinet 2016a: 304–307, 322; Martinet 2019a: 264–265). Along with other criteria, this enables the suggestion that the province of Cusae was an important centre of the royal administration in Upper Egypt during the reigns of Merenre and Pepy II (Martinet 2016a: 309–318). With regard to my typology, the 14th nome of Upper Egypt, along with the 8th and 18th nomes of Upper Egypt, belongs to the category of the provinces characterised by important interactions with the central government and a strong presence of the state (Martinet 2019b: 519–522).

The aim is now to study these family and patronage networks from a more sociological perspective. Keeping in mind the limitations of iconographical data and records coming from the burial contexts for that kind of research, I have tried to reconstruct ego-networks, that is to say, personal networks focused on *ego* who was both the owner of the tomb and the head of the household. My study goes beyond this framework, since I have also included the links between institutions and individuals. This allows me to perceive internal social dynamics within the networks as well as reconstitute, in particular, administrative networks which linked the provinces to the Memphite region.

The case study of Pepyankhheryib from Cusae (14th nome of Upper Egypt)

1) Understanding the exceptional career of Pepyankhheryib

The choice has been made to focus on the case of Pepyankhheryib⁵ who was buried in the necropolis of Meir. The reason is that his tomb (D2) displays the highest number of secondary individuals represented and named in Upper Egypt for the

⁵ I have already provided preliminary results concerning the power network of Pepyankhheryib, see Martinet 2016a: 304–309; Martinet 2016b: 19–20; Martinet 2019a: 264–265. The approach proposed here, based on written, iconographical and archaeological elements, is more methodological and statistical.

Old Kingdom period, that is to say, one hundred and twenty-four individuals.⁶ Furthermore, he is also the holder of the highest number of titles known in Upper Egypt for that period (forty-four different titles) (Kanawati 2012: pls. 72a–b, 75–91; Blackman 1924: pls. 3–9, 11–12, 14–17). He was highly involved in the central administration, holding the most important offices such as those of overseer of the royal documents and vizier. According to the reconstruction of the family history of the 14th nome of Upper Egypt by Naguib Kanawati, Pepyankhheryib would be the great-grandson of King Teti and the son of a nephew of Pepy I (Kanawati 2012: 25). It should also be noticed that his wife *Hwt-jꜣḥ* / *Hwtjt* might have been linked with the royal family, as demonstrated by N. Kanawati on the basis of iconographical criteria (Kanawati 2010: 214; 2012: 25). If these links, which remain hypothetical, can explain the social promotion of Pepyankhheryib, the analysis of the structures of his network represented in his tomb using the Gephi software could be an interesting way of investigating the mechanisms of his social promotion as well as the relationships between the different social groups represented in his tomb.

2) Using a one-mode network

a) Methodology

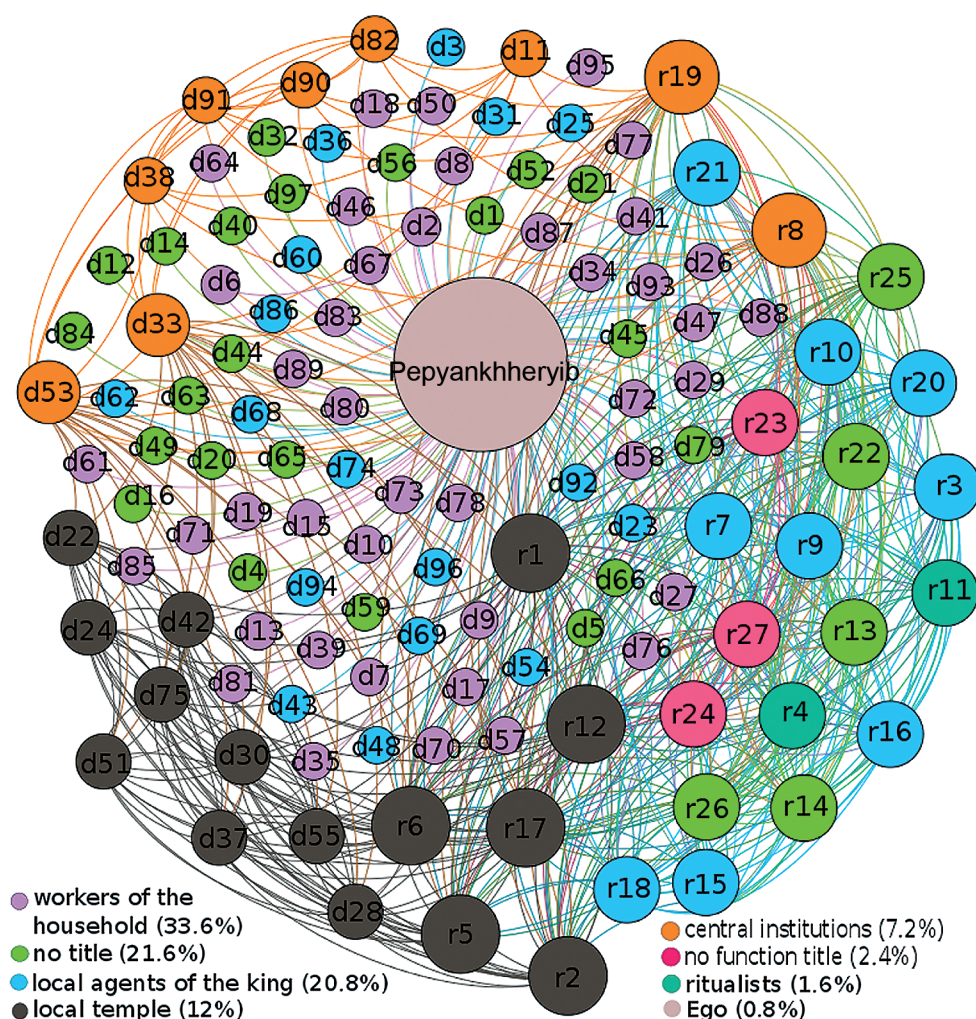
In the first instance, in order to highlight the social ties between the members of Pepyankhheryib's network, I have applied the SNA methods to the data originating from his tomb by generating a one-mode network (Fig. 1).

Nodes. The nodes correspond to *ego* and the different members of his network. The members of his extended family (linked by the bonds of blood or by marriage) are identified with a code consisting of the letter *r* (for relatives) and a number. The subordinates who belonged to his network of dependency are represented with a code consisting of the letter *d* (for dependants) and a number. The number which follows the letter *d* marks the rank of each individual according to the Egyptian “alphabetic” order. I have filled out an attribute matrix by providing different attributes for the nodes. For each member of this network, I have indicated their major functions or the main institution with which they were involved. I have also added the nature of the link with *ego* (family tie [by giving the precise link: father, mother, brother, brother-in-law, wife, wife's mother, wife's uncle, wife's relative, son, daughter, daughter-in-law, grandson and granddaughter] or subordinate relationship).

Ties. Obviously, Pepyankhheryib, or *ego*, enjoyed a link with all the persons represented in his tomb. The members of his family were logically connected with one another. Concerning the dependants of Pepyankhheryib, the sources do not provide information about the presence of ties between them. As they were part of the household and subordinated to the same individual, it is reasonable to suppose that they could have been linked (concerning the question of the transitional nature

⁶ The tomb of Pepyankhheryib (Meir, D2) contains four rooms (Kanawati 2012: 27). N. Kanawati has estimated that the area of this tomb covered less than 106 sq. m. (Kanawati 1977: 54). See also Gillam 2010: 133. For the secondary individuals quoted in the tomb of Pepyankhheryib, see Kanawati 2012: pls. 75a,d–f, 76a–b, 78–85, 88–89.

Fig. 1 Network of Pepyankhheryib (one-mode network) derived from data from his tomb.



of relationships and the existence of indirect links, see Martinet 2016b: 18), especially those who were involved in the same institutions or activities. Nevertheless, some members of this network may not have exercised their function at the same time. Remember that Pepyankhheryib had a long career, given that he had the time to obtain forty-four titles, probably between the end of the reign of Pepy I and the first third of the reign of Pepy II (Polet 2008: 84–86; see also El-Khouli – Kanawati 1989: 16–17; Kanawati 2012: 26). For this network, the choice has been made to connect members depending on their main function or activity. The presence of some specific titles indicating, for example, their involvement in the palatine administration (titles containing the term *pr-ꜥ*, “Great House”) or in the management of the local temple and its resources, enables the identification of some links between the members of this network.

b) Analysis

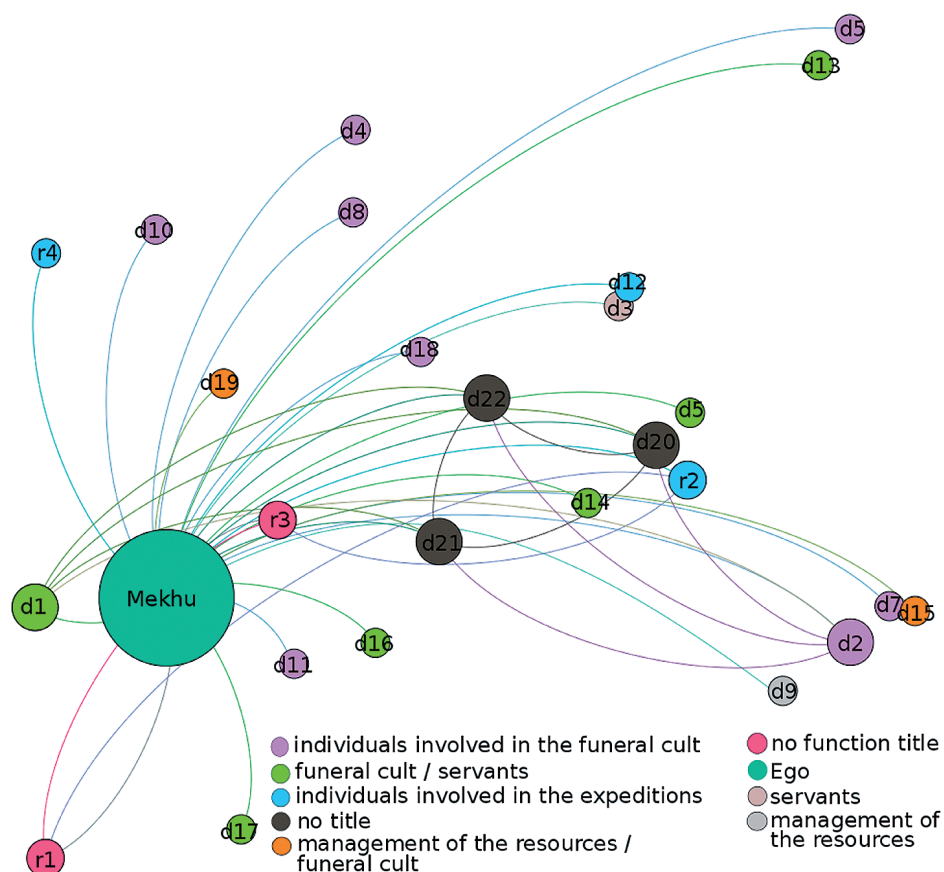
Importance of the links with the central / palatine institutions

Pepyankhheryib was linked to the central and palatine institutions via nine persons (in orange), and to a high number of local agents of the king (mainly the holders of the title *hrj-tp nzw*, who are represented in blue). The mention of members of the palatine administration (titles containing *pr-ʿ3*), state officials of various ranks (titles beginning with *z3b* and scribes of the royal archives) as well as local agents of the Crown has to be correlated with the important role of the 14th nome, the seat of the vizier-overseer of Upper Egypt, in the management of Upper Egypt and its resources during the reigns of Merenre and Pepy II (Martinet 2016a: 309–318; Martinet 2019a: 265). The presence of these different categories of officials, some with a relatively high rank, among the family and subordinates of Pepyankhheryib indicates that he was embedded into administrative networks which linked him with Memphis, the capital, and the palatine institutions. Moreover, it is remarkable that sixteen individuals, mostly members of his family, bear the title *hrj-tp nzw*, which seems to contain a dual value. As an *Ehrentitel* (cf. the terminology used by Wolfgang Helck 1954: 27), it marks the belonging to a specific social category and notes the social status of the holder, but it also implies real responsibilities (Martinet 2019b: 340–354). All these connections with various social groups, some of them having a relatively high social status, along with the control of the temple dedicated to Hathor, Lady of Cusae, by Pepyankhheryib and some members of his family and his dependants (Martinet 2016a: 308, 319) probably allowed him to maintain and increase his influence at a regional level. The high officials of the Cusite nome bore responsibilities that exceeded the borders of this province owing to the establishment of a peculiar administrative structure (for the characteristics and some explanatory factors of this administrative structure, see Martinet 2016a: 312–316; Martinet 2019b: 457–471). From the analysis of prosopographical data, we actually know that high officials of Cusae were overseers of the priests before obtaining the office of overseer of Upper Egypt which, in this case, implied some responsibilities at the level of the middle provinces of Upper Egypt (Martinet 2016a: 310–316, 319; Martinet 2019: 265).

This network contrasts notably with the networks which are represented in the Qubbet el-Hawa tombs, as shown by the data coming from the tomb of Mekhu (Edel 2008: pls. 1–7; Fig. 2).

In the tomb of Mekhu, the father of Sabni, the subordinates were mainly involved in the cult of the tomb owner (about 60%). However, as demonstrated by Shafik Allam, the *hmw-k3*, “*ka*-servants”, also had duties in the household (Allam 1985: 1–15). In this network, some of them were at the same time household workers, like servants or in charge of the management of the local resources, as a *jmj-r sšr*, “overseer of linen”. State officials and members of the palatine administration are not attested in this network (concerning this feature and some explanatory factors, see Martinet 2017: 264–265, 268).

Fig. 2 Network of Mekhu derived from data from his tomb.



The peculiar role of some “brokers” in the network of Pepyankhheryib

Particular attention should be given to the role of some members of the palatine administration who do not seem to have had a family link with *ego*. Some centrality measures are useful in determining their position in terms of importance.

Concerning degree centrality, *ego* had the highest number of ties (one hundred and twenty-four), as he was obviously linked with each member of his network. The members of his family had twenty-seven, thirty-four or thirty-eight ties. The subordinates d33 and d53 had twenty-four ties, respectively, the highest number of links among the dependants. The number of their ties is connected with the fact that they had responsibilities in several institutions. The subordinate Merwekhankhef (d33) was involved in the management of the resources as a *jmj-r pr*, “overseer of the house”, and in the local temple as a *shd hm(w)-ntr*, “inspector of the priests”. He also had palatine functions as a *hrj-tp nzw pr-3*, “royal chamberlain of the Great House”. The importance of their role as connectors is confirmed by another centrality measure, eigenvector centrality, which measures important people known by each member of the network and allows the identification of highly connected individuals (Table 1).

Persons	Eigenvector centrality measure
Ego	1.0
r1	0.8318778368578179
r2	0.8318778368578179
r3	0.6942047659953984
r4	0.6942047659953984
r5	0.8318778368578179
r6	0.8318778368578179
r7	0.6942047659953984
r8	0.7510032240151313
r9	0.6942047659953984
r10	0.6942047659953984
r11	0.6942047659953984
r12	0.8318778368578179
r13	0.6942047659953984
r14	0.6942047659953984
r15	0.6942047659953984
r16	0.6942047659953984
r17	0.8318778368578179
r18	0.6942047659953984
r19	0.7510032240151313
r20	0.6942047659953984
r21	0.6942047659953984
r22	0.6942047659953984
r23	0.6942047659953984
r24	0.6942047659953984
r25	0.6942047659953984
r26	0.6942047659953984
r27	0.6942047659953984
d1	0.03829176696377185
d2	0.04024202925358934
d3	0.03829176696377185
d4	0.03829176696377185
d5	0.03829176696377185
d6	0.04024202925358934
d7	0.03829176696377185

Persons	Eigenvector centrality measure
Ego	1.0
d8	0.03829176696377185
d9	0.03829176696377185
d10	0.03829176696377185
d11	0.14387729760260523
d12	0.03829176696377185
d13	0.03829176696377185
d14	0.03829176696377185
d15	0.03829176696377185
d16	0.03829176696377185
d17	0.03829176696377185
d18	0.03829176696377185
d19	0.03829176696377185
d20	0.03829176696377185
d21	0.03829176696377185
d22	0.3421290989914457
d23	0.03829176696377185
d24	0.3421290989914457
d25	0.03829176696377185
d26	0.03829176696377185
d27	0.03829176696377185
d28	0.3421290989914457
d29	0.03829176696377185
d30	0.3421290989914457
d31	0.03829176696377185
d32	0.03829176696377185
d33	0.41989184715393724
d34	0.03829176696377185
d35	0.03829176696377185
d36	0.03829176696377185
d37	0.3421290989914457
d38	0.14387729760260523
d39	0.03829176696377185
d40	0.03829176696377185
d41	0.03829176696377185

Table 1 Eigenvector centrality measure.

Persons	Eigenvector centrality measure
Ego	1.0
d42	0.3421290989914457
d43	0.03829176696377185
d44	0.03829176696377185
d45	0.03829176696377185
d46	0.03829176696377185
d47	0.03829176696377185
d48	0.03829176696377185
d49	0.03829176696377185
d50	0.03829176696377185
d51	0.3421290989914457
d52	0.03829176696377185
d53	0.41989184715393724
d54	0.03829176696377185
d55	0.3421290989914457
d56	0.03829176696377185
d57	0.03829176696377185
d58	0.03829176696377185
d59	0.03829176696377185
d60	0.03829176696377185
d61	0.03829176696377185
d62	0.03829176696377185
d63	0.03829176696377185
d64	0.03829176696377185
d65	0.03829176696377185
d66	0.03829176696377185
d67	0.03829176696377185
d68	0.03829176696377185
d69	0.03829176696377185

Persons	Eigenvector centrality measure
Ego	1.0
d70	0.03829176696377185
d71	0.03829176696377185
d72	0.03829176696377185
d73	0.03829176696377185
d74	0.03829176696377185
d75	0.3421290989914457
d76	0.03829176696377185
d77	0.03829176696377185
d78	0.03829176696377185
d79	0.03829176696377185
d80	0.03829176696377185
d81	0.03829176696377185
d82	0.14387729760260523
d83	0.03829176696377185
d84	0.03829176696377185
d85	0.03829176696377185
d86	0.03829176696377185
d87	0.03829176696377185
d88	0.03829176696377185
d89	0.03829176696377185
d90	0.14387729760260523
d91	0.14387729760260523
d92	0.03829176696377185
d93	0.03829176696377185
d94	0.03829176696377185
d95	0.03829176696377185
d96	0.03829176696377185
d97	0.03829176696377185

Pepyankhheryib was followed by six members of his family (r1, r2, r5, r6, r12 and r17, *cf.* Fig. 1) with the second highest score, indicating they were linked with highly connected individuals. They were obviously tied to other members of this family, who were all linked together. Furthermore, they were linked with the other individuals who were involved in the local temple and the cult of Hathor. They were connected to one another insofar as they exercised a function in the same local institution.

The subordinates Merwekhankhef (d33) and Hepi (d53) have the highest eigenvector centrality score among the dependants (0.41989184715393724). Owing to the role of Merwekhankhef in the middle management level of the priests as a *shd hm(w)-ntr*, “hem-netjer-inspector of priests” and the fact that Hepi was, as a *mnjw tntt*, “herdsman of the *tjentet*-cattle”, in charge of the cows connected with the cult of Hathor in Cusae,⁷ these two subordinates should have been linked with the members of Pepyankhheryib’s family who had responsibilities related to the management of the priests and the cult of Hathor and who were highly connected with the other members of the kin group. These two dependants played the role of “brokers” in Pepyankhheryib’s network (see also Martinet 2016b: 19–20). Since they had duties in institutions in which some members of his family also exercised functions, they probably contributed to the formation of social links between the individuals in Pepyankhheryib’s household.

3) Using a two-mode network

In order to analyse more precisely the hierarchical relationships which structured the network of Pepyankhheryib, the links between individuals and the institutions in which they played a role as well as the phenomenon of multi-skilling, I tried another way to visualise the data by generating a two-mode network. I filled a node list with two sets of nodes: a) the members of the network and b) their functions or the institutions in which they were involved.

- a) The codes that have been assigned to the members of Pepyankhheryib’s family and dependants are identical to those which used for the one-mode network (Fig. 1).
- b) I have classified his relatives and subordinates into thirteen categories depending on their titles:
 - 1) members of the palatine administration (titles containing *pr-ʿ3*);
 - 2) state officials (titles beginning with *z3b*) and scribes of the royal archives (*zš(w) ʿ nzw*);
 - 3) other scribes (*jmj-r zš(w)*, “overseer of scribes”, *zš*, “scribe”, *zš sp3t*, “scribe of the province”, *zš šnwt*, “scribe of the granary”);
 - 4) superiors of the priests (*jmj-r hm(w)-ntr*, “overseer of priests”, *shd hm(w)-ntr*, “inspector of priests”), employees of the local temple (*hm-ntr*, “hem-netjer priest”, *zš hwt-ntr*, “scribe of the temple”), and other persons involved in the cult of Hathor of Cusae (*hnwt (nt) Hwt-hr (nbt Kjs)*, “sistrum player of Hathor (Lady of Qusiya)”, *mnjw tntt*, “herdsman of the *tjentet*-cattle”);
 - 5) individuals involved in ritual (*hrj-hb(t)*, “lector priest”);
 - 6) individuals who were in charge of the management of the resources (*jmj-r pr*, “overseer of the house”, *jmj-r sšr*, “overseer of linen”, *hrj-tp šnwt*, “servant of the granary”, *shd (n) jrj(w) ht*, “inspector of custodians of property” and so on);

⁷ In Dendera, the title *mnjw tntt* was held only by the overseers of the priests of Hathor from the late Old Kingdom. In the 14th nome of Upper Egypt, the title was held by individuals of lesser importance under the supervision of the *jmj-r hm(w)-ntr*. See Fischer 1968: 26–27; Allam 1963: 36; Gillam 1991: 159–161; Jones 2000: 434–435, no. 1602. Concerning the cult of Hathor in this province, see also Allam 1963: 23–41.

- 7) individuals who were involved in the overseeing of work and building (*mtj n z3*, “regulator of a phyle”, *shd zš(w) kdwt*, “inspector of draughtsmen / architects”);
- 8) individuals who had duties concerning the cult of the tomb owner (*shd hm(w)-k3*, “inspector of *ka*-servants”, *hm-k3*, “*ka*-servant”);
- 9) servants (*hrp zh*, “director of the dining-hall”);
- 10) supervisor of the fields and domains (*jmj-r 3ht*, “overseer of fields”, *hk3 hwt*, “ruler of the estate”);
- 11) local agents of the king (*jmj-r zš(w) 3ht*, “overseer of the scribes of the field”, *hrj-tp nzwt*, “royal chamberlain”);
- 12) individuals who were responsible for the management of the *hut-ka* (*shd hwt-k3*, “inspector of the *hut-ka*”)
- 13) individuals who had no function title and individuals whose titles were not detailed in the tomb of Pepyankhheryib (this thirteenth category is not represented in the sociogram).

The edge list contains the ties between the individuals and their function(s) / institution(s). I have obtained the following sociogram:

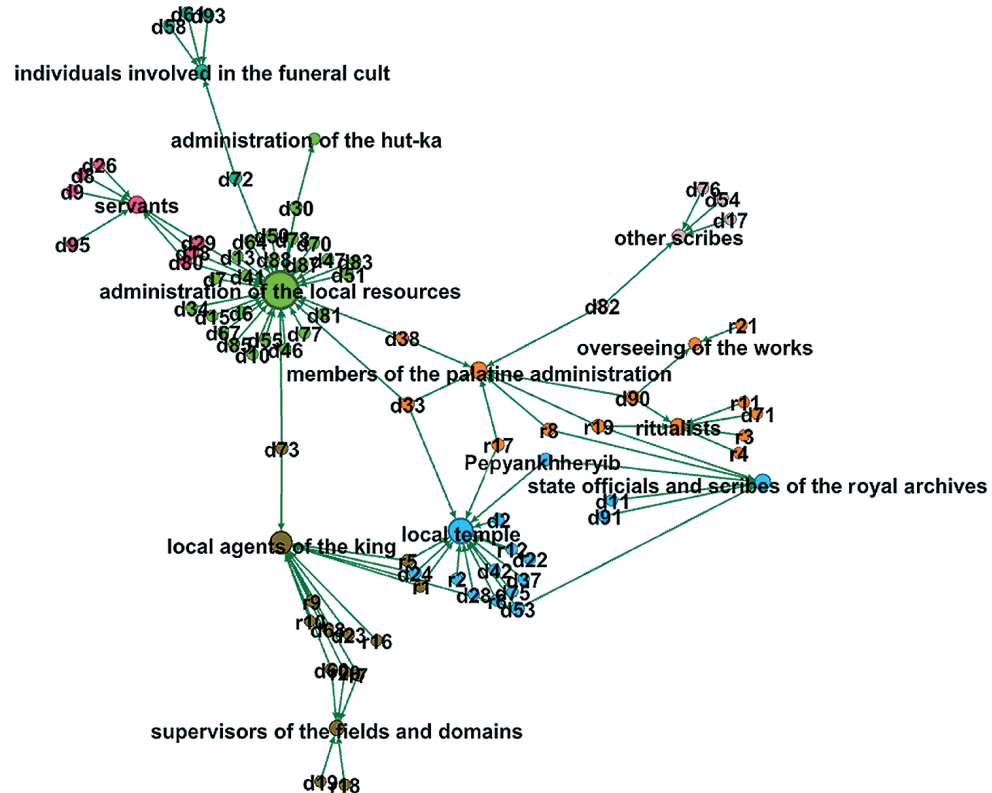


Fig. 3 Network of Pepyankhheryib (two-mode network): the “modularity class” tool.

The tool “modularity class” allows the identification of seven “communities”. The role of those individuals who had titles related to the palatine administration and had contacts with the Court, like Merwekhankhef (d33) or Nyankhkhnum / / Memy (d38), who was a physician of the palace (*zwnw pr-ʿ3*) and was responsible for the management of the resources as a *jmj-r pr*, “overseer of the house”, is still visible. They hold a central position in this sociogram. The individuals who were involved in the palatine administration (represented in orange) were directly connected with other categories of subordinates. By contrast, servants (represented in pink) and the individuals who participated in the cult of the tomb owner (represented in the top part of this network) were clearly far from members of the palatine administration or state officials. Some persons in the category of servants were directly connected with the individuals concerned with the management of resources. However, they do not appear to have been directly linked with those who played a role in the palatine administration or in the state administration. The individuals who had functions in the local temple (represented in blue) were mainly members of the palatine administration, state officials or local agents of the king. By contrast, the persons who belonged to the categories of servants or other scribes seem not to have been involved in the local temple. If some offices-titles could have been combined, some individuals, such as those who were in charge of the funeral cult as well as the members of the category of servants, were specialised subordinates and were not granted access to certain responsibilities. This two-mode network provides a new way of seeing the data by revealing the social and administrative complexity of the Pepyankhheryib’s household. Differences in status are visible:⁸ the rank of each secondary individual depended on his duties, the nature of his link to the owner of the tomb as well as his integration, or non-integration, in specific networks linked to the Memphite region. If multi-skilling concerned about 15% of the titled individuals belonging to Pepyankhheryib’s network, some functions were mutually exclusive.

4) Some additional information about the middle- and low-ranking officials who are mentioned in the tomb D2 (cemetery of Meir) and their possible burial place

The high number of secondary individuals represented in Pepyankhheryib’s tomb and the important role of some of them raise the question of where they were buried. One of his subordinates, Nyankhkhnum / Memy (d38), who seems to have had a relatively important status compared to other dependants as a *zwnw pr-ʿ3*, “physician of the palace” and *shd zwnw*, “inspector of physicians” (Kanawati 2012: pls. 79, 81, 85, 89), is also known by two objects inscribed with his name: a coffin (Kamal 1914a: 172) and a headrest (London BM EA69249; Kamal 1914a: 172, fig. 22; Bourriau 1984: 131 (246)), which probably come from the southern part of the necropolis of Meir according to Bertha Porter and Rosalind L. B. Moss (Porter – Moss 1934: 256). In fact, he bears the title *zwnw pr-ʿ3* both on his coffin and in room 3 of the tomb of Pepyankhheryib (Kanawati 2012: pls. 79, 81, 89). If the precise provenance of these objects is not known, the south end of the necropolis of Meir corresponds to the E sector in which are situated

⁸ Concerning the differences in status in the 1st nome of Upper Egypt, see Vischak 2015: 213.

some inscribed tombs of middle-ranking officials dating to the late Old Kingdom (see tombs E1 to E4; Kessler 1982: col. 15–16; Blackman – Apted 1953: 58–60, pls. 47–49; Kamal 1914a: 166–167, 171, 175). B. Porter and R. L. B. Moss indicate that some other inscribed coffins have been found in tombs which were located near the tomb of Nenki (tomb E2) (Porter – Moss 1934: 256; Kamal 1914a: 176–177). It should be further noted that shaft graves are situated at the foot of these tombs in the E sector, some of them belonging to the Old Kingdom (Alexanian 2001: 214, n. 1065). However, these shaft graves have not received much attention and their architecture is not documented (Kessler 1982: col. 14, n. 7; Kamal 1914b: 74–75; Blackman 1914: 4–5). Some of them could have belonged to some dependants of Pepyankhheryib, whose tomb was located not far away, in the D sector of the necropolis, that is to say, 300 meters north of the E sector. This would correspond to the funerary pattern consisting of the burial of subordinates in the neighbourhood of the tomb of their patron (Campagno 2014: 13–14), a pattern visible also in nearby provinces in the late Old Kingdom. In Sheikh Saïd in the 15th nome of Upper Egypt, about a hundred tombs are known, most of them uninscribed. Some of them could have belonged to the subordinates of the local elites who were buried there in the Late Fifth Dynasty and Sixth Dynasty (Davies 1901: 2–5, pls. I–II). Moreover, the necropolis of Zawiyet el-Meitin, in the 16th nome of Upper Egypt, is characterised by the presence of a hundred of subsidiary tombs belonging to the “middle class” and located below the tombs of the local elites (Moeller 2016: 217, n. 29–30 and 218, fig. 7.2; Bussmann *et al.* 2016: 38–41). In the cemetery of El-Kom el-Ahmar Sawaris, near Sharuna (18th nome of Upper Egypt), it is also important to note the presence of multiple shaft graves containing a square shaft dating to the late Old Kingdom situated near inscribed Sixth Dynasty tombs (Schenkel – Gomaà 2004: 58, n. 14, pl. 18, 22). Such examples reveal similar patterns and the existence of the “practices of patronage” (Campagno 2014: 14) in the late Old Kingdom. Further excavations in the necropolis of Meir will hopefully provide us with interesting information about social stratification in the 14th nome of Upper Egypt.

It should also be noticed that the name of one of Pepyankhheryib’s subordinates, Haishetef (*H3-jšt=f*) (d52), shows a strong similarity to that of the holder of the wooden statuette CGC 786 (= JdE 30528) measuring 0.36 metres and coming from the cemetery of Meir (Borchardt 1930: 93, pl. 145; Porter – Moss 1934: 257). The name of the owner of this statuette, *H3-jšwt=f* (Haishutef), contains a further sign consisting of three strokes (Z2), which is not present in the name of *H3-jšt=f*, the subordinate of Pepyankhheryib (Blackman 1924: pl. XV; Kanawati 2012: pl. 83 (the name is now poorly preserved); Ranke 1935: 231 [25]; Scheele-Schweitzer 2014: 529 [2318]). In any event, the Haishutef known from the statuette is later than the late Old Kingdom, owing to the abbreviated writing, without the yod, of the term *jm3hw* (Fischer 1968, 131, n. 578) and the writing of the element *jmj-r* of the title *jmj-r pr*, which is written with the sign of the tongue (F20) instead of the sign of the owl (G17) and the sign of the mouth (D21), according to the statement provided by Ludwig Borchardt (1930: 93).⁹

⁹ This writing of *jmj-r* with the sign of the tongue expanded during the reign of Senusret I (Fischer 1996: 45, n. 22), although some earlier examples with a transitional writing are attested (Brovarski 1989: 591; Legros 2010: 197–198).

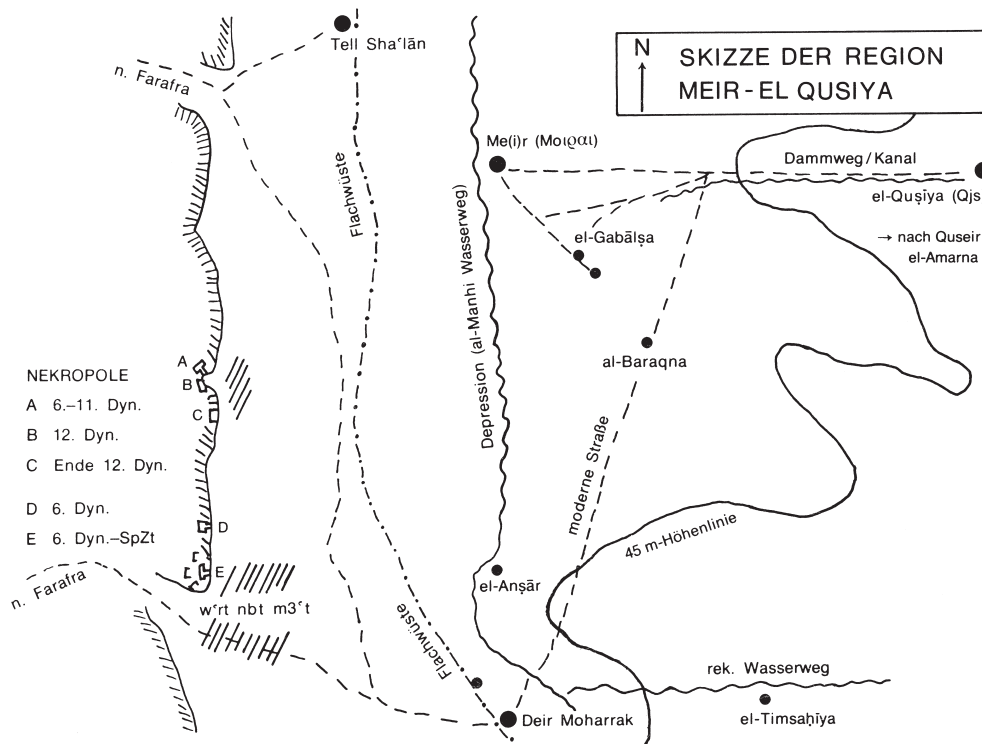


Fig. 4 Map of the region of Meir – El-Qusiya (from Kessler 1982: col. 15–16).

Concluding remarks and additional perspectives

Specific focus on the 14th nome of Upper Egypt is of great interest owing to the rise of the provincial ruling family as well as the peculiar position of the members of this family and some of their subordinates in the royal administration in the second part of the Sixth Dynasty. Moreover, the recent discovery in Abusir by the expedition of the Czech Institute of Egyptology of the tomb of a very high official, Kaires, who was also priest of the goddess Hathor, the Lady of the Sycamore in Cusae,¹⁰ reveals the existence of ties between the monarchy and the 14th nome of Upper Egypt from the time of the previous dynasty, more precisely towards the reigns of Sahure and Neferirkare.

Sociograms allow to uncover the role of some individuals in the networks of the provincial elites as well as detect the social dynamics of these networks, which was not noticeable from the manual method. The visual representation using the Gephi software is a useful tool which helps to analyse the (hierarchical) relationships between the social groups that comprised the patrimonial household. One of the main benefits of applying SNA methods to written sources coming from provincial tombs

¹⁰ Concerning this discovery, see the web page of the Czech Institute of Egyptology: <https://cegu.ff.cuni.cz/en/2018/10/02/the-discovery-of-the-tomb-of-priest-kares/>. Accessed on 15 January 2019.

is the ability to perceive the social structures in a more dynamic manner in order to highlight the peculiar role of some “brokers” in social networks. By providing the possibility of calculating centrality measures as well as the option of using the “modularity class” tool, which allowed the identification of seven “communities” in the two-mode network (Fig. 3), the Gephi application helps us perceive the social structures by revealing that under the authority of Pepyankhheryib, some members of his family may have enjoyed a strong position which was also due to their high connectedness and their duties in central and local institutions. A few subordinates, such as Merwekhankhef (d33) or Nyankhkhnum / Memy (d38), may similarly have had important roles, since they had responsibilities in the palatine administration and contacts with the Court. Given their involvement both in the management of local resources and in the palatine administration, they may have played a “broker” role by linking some isolated clusters of the network. The subordinates Merwekhankhef (d33) and Hepi (d53) may have been connected with the members of Pepyankhheryib’s family who held key functions in the local temple, since these subordinates held titles related to this local institution. Owing to the plurality of their responsibilities as well as their relationships with the local ruling family, some of whose members also bear titles in connection with the palatine administration and the local temple, the dependants d33 and d53 seem to have played a key position in this network. They were very well connected, especially with some individuals of the kin group who were themselves highly connected, as shown by the eigenvector centrality measure. At lower levels, the members of the category of servants as well as the people who were in charge of the cult of the tomb owner were not directly tied to the individuals who had titles related to the palatine administration or the state administration. According to their titles, it seems that they were not directly linked with the local family and that they did not receive other functions.

These results have to be treated with caution insofar as these networks are not complete networks. I have made the choice of concentrating on a set of ties, namely those known from the iconographical programmes of the tomb of Pepyankhheryib; moreover, such historical sources tend to be one-sided for that kind of research. Close ties existed between Pepyankhheryib and other persons buried in the necropolises of Meir and Quseir el-Amarna (El-Khouli – Kanawati 1989: 14–15, 25–26; Kanawati 1989: 77–78). For example, Ptahshepses, whose coffin was found in the tomb of Nenki in the cemetery of Meir (tomb E2) (Kamal 1914a: 175), may have been related to Pepyankhheryib (Polet 2008: 90). Furthermore, Pepyankhheryib must have been linked with the owner of the tomb D1, Pepy, which is located about 90 meters north of that of Pepyankhheryib (D2) (Blackman – Apted 1953: 57–58, pls. 3, 44–46). N. Kanawati considers it very likely that the owner of tomb D1 is mentioned several times in tomb D2.¹¹ According to Sébastien Polet, this Pepy would have been one of the young brothers of Pepyankhheryib who are represented in tomb D2 (Polet 2008: 89–90).

SNA methods represent an interesting way of analysing the process by which a provincial official could have reached a better socioeconomic status, especially

¹¹ I would like to thank Prof. Naguib Kanawati for this personal communication.

a higher status in the court society. Although the role of the king was crucial in social advancement, the analysis of the networks of the provincial elites highlights the importance of *capital social*, as understood by the French sociologist, Pierre Bourdieu (1980: 2–3; Martinet 2019a: 264). If the size of Pepyankhheryib's network reflects his very high social status, the profile of the members of his network and their degree of connection with the palatine sphere, the central institutions as well as the local temple may also have had an impact on his elevation in the hierarchy and the social reproduction of the ruling family of Cusae. The application of SNA methods to the different social groups that are represented in provincial tombs helps partly explain the process of social promotion insofar as different aspects, such as the fact of belonging to specific social networks, personal ties with the royal family and merit, have to be taken into account (Martinet 2019a: 264–268). Moreover, other factors can explain the rise of some provincial families in the late Old Kingdom, and these need to be considered in order to analyse the mechanisms of social mobility. In the case of the 14th nome of Upper Egypt, its agricultural potential seems to have had an impact on the shaping of its administrative structure under the reigns of Merenre and Pepy II (Martinet *forthcoming*). As stated above, the Coptite elites eventually acquired a very elevated status towards the end of the Eighth Dynasty, thanks to a combination of several factors (see above and Martinet 2019b: 72, 105–106, 589; Martinet *forthcoming*), including the strategic position of the province near the road to the Red Sea (Fischer 1964: 1–2; Yoyotte 1966: 45–58), from which the temple of Min and the elites who controlled it profited. Hence, in order to analyse the mechanisms of the social mobility of the provincial elites, I shall have to provide an overall view of the social networks which structured provincial society in the Old Kingdom by tackling this issue globally, based upon a crossover study of the written, iconographical and archaeological sources.

Because my starting point was the study of the provincial administration, as a first step, I explained the role of the elites of the 14th nome of Upper Egypt at the levels of the central administration and Upper Egypt and, in particular, that of Pepyankhheryib. I indeed used a global approach in order to reconstruct the provincial administrative system as well as the position of the 14th nome of Upper Egypt in the overall administrative structure (Martinet 2016a: 299–324; 2019: 65–66, 124, 185–188, 457–471). Concerning the social structures in the provinces, the consideration of the different sources combined with the analysis of the distribution of some rank titles among the provinces and the study of the social networks of the provincial elites allowed me to reach an initial interesting observation: the existence of a correlation between the rank obtained by the provincial elites, the structures of their ego-networks and the type of administrative structure in the 1st and 14th nomes of Upper Egypt (Martinet 2019a: 260–273). This first step, which made it possible to reveal macro-structural patterns, was crucial before, secondly, using a micro-historical perspective to investigate the precise trajectory of Pepyankhheryib and understand the positions of each member of his network as well as the internal dynamics between the social groups. “Navigating scales in network” (Lemercier 2015: 281–310) is indeed essential for revealing the overall structure of the network of the provincial elites as well as for determining the precise place of Pepyankhheryib and some of his subordinates

at different levels. It is necessary to connect social logics with space by analysing the social logics on several scales: local, supra-provincial and central. If the study of the social categories was an entry point, the use of SNA methods has allowed us to focus on the individuals' links and careers in their particularity.

Further application of SNA methods is possible. For example, in order to study the social structures in the 1st nome of Upper Egypt in the late Old Kingdom, I plan to apply SNA methods to the hundreds of inscribed vessels that have been found in Qubbet el-Hawa tombs (Höveler-Müller 2011: 231–253; see, for example, the tomb QH 88: Edel 1975: pl. 2–100; Höveler-Müller 2006). These vessels, which were donated to the tomb owner, were inscribed with the names and titles of the donors. Juan Carlos Moreno García has underlined the importance of these material sources, which enable to highlight the social networks that were constituted around some individuals (Donnat – Moreno García 2015: 198–200). These inscribed vessels make it possible to link the tomb owner with the donors. As some givers of offerings are known from their own tombs, this provides information about tomb owners at the necropolis of Qubbet el-Hawa who were connected to other tomb owners *via* these vessels, in addition to links that are already known, especially the family ties. Moreover, considering that the family and subordinate networks are also represented with great accuracy in these tombs, it opens the possibility of investigating all the ties between the individuals known in Qubbet el-Hawa. This project requires a systematic and quantitative approach, given that the main objective will be to map the links of about five hundred and sixty individuals who are known from the documentation of Qubbet el-Hawa dating to the late Old Kingdom, including inscriptions in the tombs, the Elephantine papyrus and the inscribed vessels,¹² and to provide information about the dynamics of the social groups and the presence of networks inside larger networks.

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¹² This number comes from the total inventory by Elmar Edel, exclusive of the individuals who are later than the Old Kingdom (Edel 2008: CXXI–CXXV).

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Electronic and internet resources

Czech Institute of Egyptology – Kaires: <https://cegu.ff.cuni.cz/en/2018/10/02/the-discovery-of-the-tomb-of-priest-kaires/>.

Database: During my PhD studies, I created a database of about 1,500 titled individuals from the provinces (Old Kingdom). It includes specific data concerning individual persons (dating, monuments, titles and the precise location of these titles in their tombs or in other documents) as well as information concerning their family

links and their subordinates. Hence, this database contains not only high-ranking provincial officials but also the members of their extended family and their subordinates who were represented in their tombs, sometimes with their own titles and relationships. The database has now been published (the second volume of the publication of my PhD thesis) and I plan to make it accessible online in the future.

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