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Diplomová práce

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Administrative activities in Raneferef's pyramid complex according to the evidence of seal impressions

Správní aktivity v Raneferefově pyramidovém komplexu podle svědectví pečetních otisků

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Klíčová slova:

administrativa starověkého Egypta, pečetní otisky, kretuly, pečeti, Stará říše, Abusír, Raneferefův pyramidový komplex

Abstrakt:

Předložená práce usiluje o opětovné prozkoumání pečetních otisků, které byly nalezeny během vykopávek v areálu pyramidového komplexu krále Raneferefa v Abusíru, respektive té části nálezového souboru, který je uložen ve sbírkách Náprstkova muzea v Praze. Zabývá se obecnou typologií kretul, metodologií jejich dokumentace a snaží se zkoumané pečetní otisky typologicky zařadit. Ve druhé části se soustřeďuje na zpřesnění poznatků o aktivitě a pravomocech úředníků, používajících pečeti v souvislosti se správou Raneferefova pyramidového komplexu. Toho má být dosaženo hledáním stop opakovaně používaných pečetí na nalezených otiscích a zkoumáním charakteru jejich držitelů a jejich pečetních aktivit; jsou sledována místa kde byly pečetní otisky nalezeny, tituly, které na nich byly doloženy a typy předmětů, které jimi byly pečetěny.

Keywords:

Ancient Egyptian Administration, sealings, cretulae, seals, Old Kingdom, Abusir, Raneferef's Pyramid Complex

Abstract:

The aim of this thesis is to re-evaluate and re-discuss sealings that were uncovered during the excavations of the pyramid temple of King Raneferef in Abusir, resp. those which are kept in the collections of the Náprstek Museum in Prague. It deals with the general typology of cretulae and the method of their documentation and it tries to assess sealings under study in regard to the former typology. The second part of the work attempts to find details regarding the activity and authority of officials who were using seals in connection with the operation of the pyramid complex of King Raneferef. This was attempted by a search for recurrent seal designs attested on fragments of cretulae found in the area of the pyramid complex and by a study of the properties of their seal holders and their activity, areas where the fragments of sealings were found, titles that were attested on their sealings, and kinds of objects that were sealed by their seals.

I would like to thank everyone who helped and assisted me in the presented work.

First of all, this work would not be possible without the kind help of three people. Miroslav Verner allowed me to try to build upon the results of his impressive work and encouraged me to search for the further potential of sealings from the Raneferef pyramid temple. Hana Vymazalová provided me with all kinds of help in preparing and conducting the study; she was an attentive reader whose suggestions and comments helped greatly improve all parts of the work that were prepared in advance. Surely, and not in the least, Pavel Onderka provided me with exceptional hospitality on the premises of the Náprstek Museum and helped me on practical study matters as well as with discussions and suggestions. It was his patience and generosity that enabled me not only to carry out the time-consuming documentation of the material, but also created an opportunity to get acquainted with cretulae and take the time to think through how they could be “read”.

I would like to extend my thanks to Ladislav Bareš, who helped me become better acquainted with the history of excavations of the pyramid temple of King Raneferef, and to the teachers and colleagues who helped me through discussions and suggestions, particularly Jana Mynářová, Jiří Honzl, Dana Bělohoubková and Diana Míčková. Ali Witsell from AERA dedicated no small portion of her precious expedition time to share some of her thoughts and experience, and reassured me in the very approach to the material that I wanted to pursue.

Finally, Bryce Belcher kindly made the English text of this work comprehensible to English speaking readers as well.

Obsah

1. Introduction

For a long time, sealings were a valuable conveyor of epigraphic information for Egyptologists, as they often contained the Horus names of ruling kings, which help us date their archaeological contexts. In past decades, archaeologists have realized that the potential of study of sealings is even greater. Revision studies conducted in the 1980s upon the previously excavated material from Iranian Tall-i-Bakun (A. Alizadeh), Susa (P. Amiet), and Mesopotamian Nippur (R. Zettler) demonstrated the potential of "turn to reverses" in our reconstruction of ancient administration and economics. Alizadeh's reinterpretation of the situation in Tall-i-Bakun can be taken as a model study; it combines information from the sealings' reverses and the impressed seals to the use of particular seals to particular doors and thus describe the distribution of control over the storerooms. Activities and areas of responsibility of particular officials (seal holders) could thus be reconstructed on the basis of this material.[1]

The aim of this thesis is to re-evaluate and re-discuss sealings that were uncovered during the excavations of the pyramid temple of King Raneferef[2] in the royal necropolis of Abusir (Verner et al. 2006). Of this large group of ca. one thousand fragments of sealings, a detailed study will be presented for those which are kept in the collections of the Náprstek Museum in Prague and which were accessible to the author during his study. This group was documented particularly with regard to the recently suggested methodology, with both the seal impression and the reverse examined to extend our understanding of the administrative activities in Raneferef's pyramid temple.

In the following introductory sub-sections, the area of the study will be explained and specified. Definition of clay sealings and cretulae will be presented, and the various methods of their use will be explained. In addition, the character of the corpus of clay sealings under study will be introduced together with its place of origin, i.e. the pyramid temple of Raneferef in Abusir (see more details in Chapter 1.3) and a brief overview on recently studied comparable corpora (Chapter 1.3.2). A discussion of the present state of the classification of clay sealings (and its difficulties) will be an important excursus to our current state of research and will take us to a discussion of the chosen methodology (in Chapter 2), presenting details on the documentation and interpretation of particular sealings as well as plans for the assessment of the documented features. As this work is the first step of a larger study pertaining to the entire corpus of sealings from the pyramid temple of Raneferef and the adjacent establishments, its results should cover both the interpretation of the studied subset of sealings and the reflections of the employed methodology.

[1] Cf. Alizadeh 1994: 35 ff. for the summary of the Tall-i-Bakun study.

[2] The names of the kings of the Fifth Dynasty are sometimes referred to in the literature in slightly different forms. The presented study attempts to present them in the form used in Verner 2014, unless a different form appears in a quotation or a bibliographical reference.

1.1 Concept and function of clay sealings and the sealing practice

1.1.1 Terminological consideration

In the discussion of the sealing practice, we make a distinction between a *seal* and a *sealing*. The former is the tool which was used to imprint a seal design upon a substance. The latter refers to the substance with the imprint. This simple scheme is widely used in current literature on the subject and can be considered sufficient in most cases.

In Mediterranean archaeology, the use of the concept *cretulae* has been suggested recently.[3] In general, both terms – sealings and cretulae – are synonyms. The word *cretulae* may refer markedly to the clay objects associated with the sealing practice without a distracting coreference to a particular seal. This may be helpful in cases, i.e. when a clay object closing a package ("sealing") was not imprinted by any seal at all, or when it was imprinted with several imprints of the same seal, or even by imprints of different seals. In the present study, the term *cretula* will be used to focus the attention of the reader to the clay object itself, especially in regard to the imprint on its reverse.

1.1.2 Origins of sealing practice

When mentioning the history of the sealing practice, one must overcome two particular obstacles: (1) the uneven persistence of evidence of seals and sealings in archaeological records, and (2) the exact demarcation of the seal itself.

Basically, seals and sealings do not preserve at the same rate since they are commonly made of different substances. Each functional seal was meant to produce multiple sealings. Nevertheless, the seals were often carved of durable materials,[4] therefore there does exist the chance to find discarded or deposited seals even if the related clay sealings have vanished. This, however, makes for a somewhat loose connection between the two. When seals are attested without their respective sealings, their functionality could be questioned, particularly they could represent merely amulets, status symbols, or even jewellery pieces, or when they are attested in a context which is not, strictly speaking, functional (e.g. funeral contexts[5]). In Egypt, this problem used to pertain particularly to the earliest attested cylinder seals found in the Naqqada period contexts or to the earliest scarabs from the First Intermediate Period. In both cases, it took time to prove that both kinds of seals were used in sealing practice (i. e. to produce sealings) already at the time of its earliest occurrence. [6]

The practice of sealing predates writing, and it was not made obsolete by its emergence. Neither is it necessarily connected to statehood and its institutions, or to a complex city culture.[7] The

[3] E.g. Frangipane, ed. 2007: 16.

[4] On occasion, a less persistent material like wood could be used as well.

[5] Cf. Dubiel 2012 for a study on a set of tiny stamp seals from the cemeteries in the region of Qau-Matmar dated between the Old Kingdom and the early Middle Kingdom.

[6] Regarding the purpose of the early scarab seals, cf. C. von Pilgrim's critique of Ben Tor (von Pilgrim 2001: 161 n. 1). Also cf. the work of Jane A. Hill (Hill 2004: 1) for the account of the change in interpretation of predynastic seals before and after the discovery sealings in U-cemetery in Abydos and further information about the earliest Egyptian glyptics (Hill 2016: 113–124).

[7] Cf. Duistermaat 2012, also cf. Dubiel 2012.

practice of creating sealings has an even longer history. In Mesopotamia, the earliest sealings are attested to the late Early Pottery Neolithic period, to about 6300 BCE from Tell Ain el-Kerkh in western Syria.[8] The history of seals may go even further, but a search for the beginning of the sealing practice might be a tricky subject. It is quite possible that the sealing practice might follow the use of similar tools which could have been utilized for different purposes. We are aware of artefacts which could have been used to print some designs onto something, but their precise function is not clear. It is better, then, to speak of *stamps* (or *pintaderas*) rather than seals (Plate I.1). In Syria, the oldest attested stamps go as far back as to the Pre-Pottery Neolithic period B (ca. the second half of the 8th millennium BCE) (cf. Duistermaat 2012: 2–7).

According to Kim Duistermaat, the oldest sealings "operated in the absence of a hierarchical bureaucratic structure, such as a government or a temple administration" (Duistermaat 2012: 8). We might speculate on whether the habit of displaying authority or ownership on sealings could have originated from the custom of printing particular designs on one's own body – either for adornment or magical protection – or for branding/marking one's livestock/property, either for protection or demonstration of ownership. Any such kind of development, however, would hardly be surprising. Recently, experiments regarding the use of stamps for printing onto various surfaces were suggested and eventually conducted (cf. Gheorghiu and Skates 2008: 85–103).

In the context of the discussion of the origin of the stamps and seals, one might also try to emphasize a possible non-administrative, magical context of the use of such devices.[9] Does such multi-functionality pertain also to our corpus? The purpose of this remark is to take into consideration that we could conceptualize seals as artefacts with multiple purposes or as artefacts with some degree of fluid functionality. I would not exclude even considering multiple uses of seals, but in regard to the sealing practice, i.e. producing sealings by means of seals, no magical dimension of such a practice appears in evidence, and we prefer to omit it. (Cf. below for other kinds of multifunctionality of sealings that can still be considered within an administrative context.)

1.1.3 Functionality of sealings

As mentioned above, a sealing (cretula) is an object which functions simultaneously on two fundamental levels:

It displays some information on its obverse, embedded by the impression of a stamp seal or rolling of a cylindrical seal. In most cases, this information pertains to administrative control over the sealed object. Typically, it refers to the authority of the official who closed the object. As a sort of a "minidocument", the sealing allows us to check under whose authority the container (or door, etc.) was closed, i.e. who was responsible for its content. Alternatively, as it seems in the case of some cretulae which are inscribed by text, they might have displayed some information about the content of the sealed container.

The sealing is also a part of the mechanism which kept the sealed object closed. It is functional in the sense that the cretula was not applied on the container randomly. Securing the container (or room, etc.) was part of an ever-repeating administrative routine. It is therefore reasonable to expect that the practice was usually efficient, and that the required effort was optimized. The prospect of

[8] Duistermaat 2012: 8. The place provides several sealings. A slightly later corpus from Tell Sabi Abyad already contains hundreds of sealings.

[9] cf. Duistermaat 2012: 13 and Costello 2011.

the eventual (simple and clean) unsealing of the object should be taken into account as well. The amount of the used clay corresponded to the kind of object sealed. Cretulae were applied onto such spots where they could hold in place and where they helped to secure the binding of the container or door. As we may observe, they were very often applied on places where twines and strings were bound to pegs or to each other (either tied or simply stuck together by clay[10]), possibly on places where strings crossed, or generally on places where one needed to keep the binding so it did not slip off.

There were borderline cases in which the clay lump was a part of the binding, but this practice does not seem to have increased the security of the binding mechanism. These are considered to be bullae, a type kind of clay label which served an administrative function. It is not clear, however, whether they also guaranteed the integrity of the container.[11]

For archaeologists who try to use sealings to interpret the economic practices of a locality, the sealings also became a "material proof of transactions, [...] full-fledged 'documents' of the transactions themselves, and not merely means of protecting the goods against violations" (Frangipane, ed. 2016: 17). In recent decades, a discussion has developed on to what degree such a functionality of sealings was relevant also to the ancient Egyptian administration. The question arose as to whether the lifespan of the sealings as minidocuments could have extended beyond the period of when the sealing immediately secured an object. Several authors within the field of Egyptology, as well as other regional archaeologies, have commented on the hypothesis of filing (archiving) removed sealings for an eventual cross-check.[12]

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[10] Earlier publications (e.g. Engel and Müller 2000, Pätznick 2005) routinely referred to knots underneath clay sealings. Researchers who studied cretulae from the Anatolian palace of Arslantepe observed that twines were not tied in actual knots, but merely crossed and fixed by the clay matter to facilitate the frequent reopening and closing (cf. Frangipane, ed., 2007: 68). Cretulae studied in our corpus so far would support the latter observation. We might still ask if the closing procedures were the same, both for doors and containers closed and reopened regularly on site, and for containers which were prepared for transport or which were not expected to be opened regularly.

[11] One object in the corpus from the Raneferef's pyramid temple was considered as a representative example of such a category, but its functionality was eventually reinterpreted. Cf. below section on jar sealings in chapter 1.4.2.

[12] The idea of keeping an archive of the used sealings as a part of the administrative routine was proposed by Judith Weingarten (Wingarten 1994) to interpret the find of a large number of sealings in a small room in the palace in Karahöyük. This idea has become the topic of further discussions. It was adopted by excavators of Arslantepe (Frangipane, ed. 2007, Frangipane 2016) in the context of a likely illiterate administration. In Arslantepe, the dump of 18 thin successive layers of refuse in the room A206 contains about 5000 cretulae fragments which were apparently methodically sorted before the disposal. This is so far the strongest hint of complex operations conducted on sealings after they were taken off the containers. Into the field of Egyptology, the idea was introduced particularly by S. T. Smith (Smith 1995, Smith 2001). Archiving used sealings for a parallel cross-checking with other records is supported by Pantalacci, 1996: 361, and with caution also by von Pilgrim: 2001. Wegner 2001 criticised any stronger notion of the archivation of sealings as a practice which would allegedly *substitute* written records. Papyri from the pyramid complex of king Raneferef include also a written report on the inspection of sealings of the key points of the temple (Posener–Kriéger, Verner, Vymazalová 2006: 260 ff, 262 ff., Plate 44 A, 45-46 A, cf. also discussion in chapter 2.1 p. 336 ff.). While it does not rule out the possibility of the existence of other non-scriptural cross-checking means, it shows that the use of writing in Egypt permeates even the sealing practice.

1.2 The pyramid complex of Raneferef

King Raneferef reigned over Egypt during the Fifth Dynasty for a very short period of time. His death likely occurred already during the second year of his reign (or shortly after)[13] which had a serious impact on the building project of his mortuary monument.

The pyramid complex of Raneferef (cf. Plate I.2) is located in the royal cemetery of several kings of the Fifth Dynasty in central Abusir. The earliest royal pyramid complex established at this necropolis belonged to the second ruler of the dynasty, Sahure. Close to Sahure's pyramid complex, the pyramid complex of his son and successor Neferirkare was built. Due to the lack of information, his succession can be reconstructed in two variants. It is possible that Neferirkare was succeeded by Shepseskare, whose identity may be eventually ascribed to Neferirkare's younger brother Netjeryrenre (Verner 2014: 55). The reign of Neferirkare's son Raneferef would have followed shortly afterwards. The pyramid complex of Shepseskare has not been identified; it is possible that the project advanced merely to the level of preliminary earthworks (Verner 2014: 56). The second option is that the reign of King Raneferef took place between the reigns of Neferirkare and Shepseskare.[14]

Raneferef's pyramid complex was located to the southwest of Neferirkare's monument. The early death of the king had a severe impact on the plan of his monument – its valley temple and the causeway were never built. The core of the pyramid was erected merely up to about three quarters of the first step, and the pyramid was converted to a sort of primordial mound (Verner et al. 2006: 101).

Besides the transformation of the shape of the pyramid itself, the cult in the pyramid temple had to be put into practice earlier than expected. This resulted in several building phases gradually extending the premises of the temple from a provisional state up to a design more like the ideal funerary temple. The expansion of the pyramid temple happened mostly during the reign of King Nyuserre (Verner et al. 2006: 106).

Nyuserre finished and expanded the "due" monuments of his predecessors, Neferirkare and Raneferef, as well as his own pyramid complex in Abusir, but other rulers of the Fifth Dynasty, Menkauhor, Djedkare and Wenis, relocated their mortuary complexes to Sakkara. This shift of the royal necropolis is the best explanation for the fact that the period of reduction of Raneferef's pyramid temple tightly followed the stages of its expansion.[15]

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[13] Resp. "The builders' inscription with a date, *rntp sp tpy, Abd 4 Axt, sw* 4+x, found on a large corner block in the pyramid's core, indicated that the king did not reign longer than one or two years." (Posener-Kriéger, Verner and Vymazalová 2006: 325).

[14] Miroslav Verner has considered both possibilities (cf. Verner et al. 2006: 102 f. and Verner 2014: 55 ff.). From the reductive point of view of mere sigillographic evidence, the sequence from Raneferef to Shepseskare would comply not only with the finds of sealings with Horus name *sxm-xa.w* in the Early temple, mentioned in Verner et al. 2006: 102, but especially with the obverse of the seal 824b/I/1984 (cf. Verner et al. 2006: 230, No. 92) from the same area, which seems to combine a partial impression of the name of Raneferef in cartouche (spelled in Xbc style "Ranefer", cf. *Verner et al. 2006*: xx f.), possibly as a part of a title or establishment, and the Horus name denoting the ruling king Shepseskare.

[15] The full excavator's reconstruction of the chronology of the Raneferef's pyramid complex is described in Verner et al. 2006: 100–112 and will be commented regarding the sealings' evidence later in this text.

Before the excavation by the Czechoslovak Institute of Egyptology, headed by Prof. Miroslav Verner, the monument was considered a possibly unfinished pyramid, but its functionality was disputed. Perring called it the "Unfinished Pyramid" (Perring 1839: pl. 5), in Lepsius' list, it appears as Lepsius XXVI. Ludwig Borchard briefly dealt with the monument in the appendix of his publication on the pyramid complex of Sahure (Borchard 1910: 145–146, also cf. Abb. 152). He deduced that the pyramid should be ascribed to King Raneferef. The trial dig which he executed in the northern side of the monument uncovered no evidence to support nor disprove this hypothesis. Later the pyramid was surveyed by V. Maragioglio and C. Rinaldi (Maragioglio and Rinaldi 1977: 176–187). The monument was also referred to as a "Pyramid attributed to Ra'neferef" in the respective volume of the *Bibliographical topography* of *Ancient Egyptian Hieroglyphic Texts, Reliefs and Paintings* (Porter and Moss 1978: 340).

The examination of the pyramid complex by the team of M. Verner started with a geophysical survey conducted in 1978 (Verner et al. 2006: xvii f.), then continued with trial digging and excavation (from 1980/1981) for nine seasons. In 1982, a ritual slaughterhouse (*pr-nm.t*) was identified further to the south and was included into the excavation; the latter edifice was (with changed function) incorporated into the pyramid complex during the later expansion of the mortuary temple. The excavation was concluded in the season 2001/2002. The final results of the excavation were published *in extenso* in several volumes of the Abusir series. M. Verner's excavation particularly proved that the pyramid was actually "finished", though in an improvised way, and that the entire complex was functional for a period of time (cf. above) – it was both a place of the cult and a place of the actual royal burial.[16] The excavation of the pyramid shed more light onto the building technique of the pyramid core (Verner et al. 2006: 9), and the building inscriptions pinpointed the estimated extension of the owner's reign. Any list of the most important objects recovered during the excavation cannot omit the royal portraits of Raneferef and the fragments of the archive of the administrative papyri. The papyri, published in a separate volume of the Abusir series (Posener–Kriéger, Verner and Vymazalová 2006), provide vital evidence of the administration of the royal mortuary cult and are an important extension of the corpus of the Abusir administrative papyri. The availability of such sources raises the importance of complementary evidence of the administration of the royal mortuary cult in Abusir, namely of the corpus of sealings from the respective pyramid complex (see below).

1.3 Studied corpus and its characteristics

During the excavation of the Raneferef pyramid complex conducted in the 1980s by the Czechoslovak Institute of Egyptology under the direction of Prof. Miroslav Verner, about 1000 clay sealings were uncovered. As an outcome of the *partage*, over 300 pieces were taken to Czechoslovakia where they entered the collections of the Náprstek Museum of Asian, African and American Cultures in Prague (the Náprstek Museum falls under the National Museum of Prague). The majority of the corpus is stored in the Egyptian Museum in Cairo.

A selection of 256 sealings (from both the Prague and Cairo collections) were published by Miroslav Verner in the monograph presenting the outcomes of the excavation (Verner et al. 2006: 209–270). The publication concentrated mostly on the obverses with the seal impressions and presented a thorough analysis of the epigraphic material. Some notes were also given concerning the

[16] Mummy parts found in the burial chamber were studied and attributed to a buried king (Verner et al. 2006: 518).

imprints on the reverses of some of the pieces; these indicated further potential of the material and inspired the present study.

The present thesis elaborates on the previous publication in regard to the recently established methods, and it aims to re-evaluate the material from a different perspective. Due to the limitations of time and access to museums, as well as the quantity of the finds, this thesis focuses only on the pieces held in the Náprstek Museum in Prague.[17] It is worth mentioning that only about 10 percent (33 sealings) of the Prague collection were included in the published volume (Verner et al. 2006), while the present study includes the entire set.

In the following paragraphs, I wish to – among other things – outline the twofold specificity of the corpus. (1) How the presented corpus represents the totality of sealings excavated from the Raneferef's pyramid temple; (2) What the specific character of the sealings from Raneferef's pyramid temple is in general in comparison to other published corpora of sealings from Old Kingdom Egypt.

1.3.1 Studied subset and its relation to the whole corpus of sealings from Raneferef's pyramid complex

About 38% of the entire corpus of sealings is physically present in the Náprstek Museum in Prague while the rest is stored in the Egyptian Museum in Cairo. The current survey of the distribution of the corpus indicates that the sealings in Prague cover all the functional parts of the temple: entrance of both the early and the extended temple, northern and southern storage rooms, central part of the early temple, the "priests' city", the AC area, and the House of the Knife.[18] For most areas of the temple, the Prague collection includes between thirty to sixty percent of the sealings found there. The significant exception is the area of the southern storage rooms and the hypostyle hall of the Early temple, which were greatly underrepresented in the Prague corpus (only about five percent of the sealings from the area are in the Náprstek Museum).

Considering the particular rooms, finds from some rooms are represented in one of the collections exclusively (either Cairo or Prague), while the content of the other rooms is divided between both collections. In either case, the sets from excavations which were ascribed a particular excavation number are kept together. Regarding the documentation of the finds, the precise location of their find contexts within the rooms are marked in the plans and described in the find cards, including the designation of the stratigraphic layer. The excavation numbers were ascribed to the sealings according the particular find contexts. The volume of sets in individual excavation numbers varies between one and eighty-four sealings. The most extensive set in the Prague collection includes fifty-four sealings under one excavation number.

As the present thesis deals with the objects from the Náprstek Museum, it would be possible to refer to individual objects mainly by the object numbers of the museum. Nevertheless, there are several distinct reference systems for the identification of the sealings: the excavation numbers (e.g. 483/I/82a); the object numbers within the collection of the Náprstek Museum (e.g. P6808a); or the numbers of objects published in the *Abusir IX* volume (Verner et al. 2006) for a shorter reference (Nos. 1–250) along the excavation numbers. A combination of the excavation numbers with the letters identifying particular sealings in the sets may be considered as the most suitable reference

[17] It will be eventually supplemented by the treatment of the whole (or substantial part) of the Cairo corpus within the PhD. study of the author.

[18] The division and the respective parts of the pyramid temple will be further presented in Chapter 3.

system. This reference allows for both working most directly with the excavation documentation (find cards) and referring to pieces in the Cairo collection when necessary. A table is provided for easy translation of the excavation numbers to object numbers of the Náprstek Museum or for reference to them in parallel (see Table 1). The shortcoming of this reference system is the following: In several cases, the sets in the find cards were not given letters by the excavator; letters are therefore assigned to these individual pieces according to the Náprstek Museum order, if such an ordering exists. This is indicated by putting the letter in brackets. The reader is advised to take notice that in very rare cases, due to the large extension of some sets, the letter ordering of the Náprstek Museum differs slightly from the letter ordering within the find cards.

1.3.2 Corpus of sealings from the pyramid temple of Raneferef and other substantial corpora of sealings from the Old Kingdom Egypt

Our knowledge on the sealings of the Old Kingdom (and sealing practice in general) is based particularly upon several important corpora that were studied in recent decades.

The ancient city of Elephantine provided sealings from the Early Dynastic Period to the Middle Kingdom period, which were studied in two separate segments. Jean-Pierre Pätznick published a study of sealings coming particularly from the middle to the end of the Second and the early Third Dynasty, although specimens from further period of the Old Kingdom are also present (Pätznick 2005). He dealt with 1023 sealings and 17 seals out of over 1600 objects registered during the excavations. The corpus enables us to relate evidence of the royal administration and of the local administration, which is represented here in a high degree. Cornelius von Pilgrim published clay sealings from the First Intermediate Period and the Middle Kingdom found at the same site (von Pilgrim 2001, von Pilgrim 1996: 234–274).

A rather large corpus of several thousands of clay sealings has been gradually recovered by AERA expeditions in Giza. An important part of the Giza sealings comes from archeologically defined contexts in an area called the Pottery Mound. The Pottery Mound is a refuse area located between two units in the southeast part of the AA-area of the ancient residential town in Heit el-Ghurab. The Pottery Mound corpus was examined by John Nolan; his results are available on the internet together with the supplementary database of individual sealings and their photos (Nolan 2010). The Pottery Mound "produced 1128 registered sealings, of which 1036 show traces of at least one cylinder seal impression whereas 92 others had been incised by some sort of stylus" (Nolan 2010: 20 n.). Chronologically, the Horus names with cartouches on seals used to impress sealings from the Pottery Mound refers to two reigns of the Old Kingdom, particularly to the time of Khafre and Menkaure. The corpus is characteristic by a very high ratio of replicates.[19] About 42% of the sealings repeated fragments of limited sets of designs, which allowed Nolan to identify and reconstruct 12 core (theoretical) seals. The most active of core seals is attributed to 91 sealing fragments, while the least active of core seals was identified on 9 sealing fragments. The functional context of the Pottery Mound corpus shows an activity of a "group of Scribes of Royal Documents", who worked and sealed their containers in the pyramid town "over a limited period of time during the Fourth Dynasty" not far from the refuse area (Nolan 2010: 315). Beyond the area of the Pottery Mound, further sealings are registered (particularly in the AA area, but also in other parts of the broader area of the royal necropolis in Giza) and further theoretical seals are reconstructed, and some finds are being presented over time in articles in Aeragram by John Nolan and Ali Witsell (cf. e.g. Nolan 2013, Witsell

[19] In the given context, the replicates are sealings produced by repeated activity of the same seal.

2014), including the sealings coming from the Fifth Dynasty. The further 178 sealings from the adjacent area that may be related to the pyramid city were registered by Karl Kromer together with the results of the Austrian excavation conducted in 1971–75 (Kromer 1978, cf. particularly Kromer 1978: 93 ff. and Taf. 38–40).

A corpus of sealings of comparable size[20] from the Late Sixth Dynasty and First Intermediate Period was recovered in Balat.[21] Parts of the finds are covered in respective publications from the excavation in the Balat serie, while some of the details on the recovered sealings with the relation to the bigger picture and the reconstructed administration practice in the desert nome could be found in articles published by Laura Pantalacci (e.g. Pantalacci 1996, Pantalacci 2005).

The Cambridge University Museum of Archaeology and Anthropology keeps a collection of nearly 350 sealings, mostly from Quibell and Green's excavations in Hierakonpolis. The corpus is studied by Richard Bussmann.[22] Royal names attested in the corpus fill the period of the early Old Kingdom between the reigns of Djoser and Snofru, but Bussman notes that "later American excavations brought to light a seal impression of King Qaa suggesting that parts of the sealing corpus might date back to the First Dynasty" (Bussmann 2011: 19).

A corpus of clay sealings from the Old Kingdom of similar size was reported in a preliminary report from Buhen (Emery 1963). The collection of the clay sealings from Buhen can be found in the Petrie Museum in London. Nolan points out that "[D]espite Emery's claim that 'considerable numbers' of sealings were found in the Old Kingdom copper-working settlement at Buhen, Kaplony was able to account for only 339 fragments" (Nolan 2010: 123).

A set of 69 sealings, found by Capart's expedition to Elkab in 1938 and held in the Royal Museums of Arts and History in Brussels, was studied by Ilona Regulski (Regulski 2009). The corpus documents activity of the local administration on the turn of the Second and Third Dynasty, and sealings "mention private names and/or titles; royal seals are completely absent" (Regulski 2009: 41).

The closest comparanda of the corpus of clay sealings from the pyramid temple of Raneferef would be other clay sealings from Abusir and Abu Ghurab. A corpus of ca. 160 sealings from the mortuary temple of Queen Khentkaus II was published by Miroslav Verner in the Abusir series (Verner 1995). A smaller part of the corpus is kept in the Náprstek Museum in Prague while the majority is in the Egyptian Museum in Cairo. A somewhat confusing situation pertains to the sealings from Borchardt's excavations in Abusir and Abu Ghurab. Nolan describes the confusing divergences in literature (Nolan 2010: 119–122) and leaves open possibilities of great volumes of sealings destroyed during World War II and/or perhaps deposited in discard heaps. Another 50 sealings from excavations of the sun temple of Weserkaf in Abu Ghurab were found by a later German-Swiss expedition (Kaplony 1969).

The sealings from the Middle Kingdom period and later are generally beyond the scope of this work, yet one cannot omit the important corpus of stamp sealings which presents an interesting

[20] Nolan 2010: 21 provides information that by the year 2001, the excavations produced 919 impressed sealings.

[21] For a brief introduction to the excavations in Balat see Pinarello 2015: 102. For Pinarello, Balat is a case study of the work, which attempts a critical re-examination of the use of literacy in administration practice in Ancient Egypt and eventually also the concept of the scribe itself.

[22] A short preview of the project was presented in a journal Egyptian Archaeology, cf. Bussmann 2011.

parallel to the corpus from the pyramid complex of King Raneferef in terms of functionality and hopefully will be compared in future studies. It was uncovered during the modern excavations of the mortuary temple of King Senwosret III in Abydos, led by Josef Wegner.[23] A large corpus of 6500 (or more) sealings[24] was excavated in the broader area of the temple, particularly in its adjacent refuse area.[25] Another 2500 (or more) sealings[26] were excavated in the nearby settlement of Wah Sut, where Wegner uncovered the palace of the local governors also responsible for the administration of the mortuary temple. Such an interrelated corpus allowed Wegner to offer his own typology of sealings[27] as well as a model of the institutional organization based on reconstructed stamp seals both from the temple and the governor's residence, and to claim prospect for a detailed prosopography and chronology of officials related to the mortuary complex of Senwosret III.

In conclusion, we can see that (except for different parts of sealings from the Abusir and Abu Ghurab) each large Old Kingdom corpus is to some degree different from the others, either in terms of time, functionality, or the level/branch of the administration. The prominently represented containers vary, and in a further chapter on the typology of seals and sealings it will be shown, with some urgency, that each study defines typologies to primarily sort its own finds.

For the corpus studied in this work, the Giza corpus is particularly interesting in terms of spatial affinity and, with some limitations, also in temporal aspect. They are both related to central or royal administration and are related to the mortuary cult of kings, though the sealings from the Heit el Ghurab are found in the settlement context and might be nuanced to the phase when the complexes were constructed.[28] The closest relatives for the sealings from the pyramid complex of King Raneferef thus remain other corpora from the royal necropolis in Abusir, particularly from the pyramid complexes of Queen Khentkaus II and King Neferirkare. A study of this set of establishments is even more interesting, as each of them provides fragments of their own papyri archives and would be a subject of the future extension of the presented work.

[23] Cf. Wegner 2000, Wegner 2001, Wegner 2004 and more recent publications.

[24] Results published in a publication of the excavations are based on ca. 6500 sealings excavated from 1994 to 2004. Cf. Wegner 2007 :299

[25] Like in Giza, the number of replicates from the temple area slightly exceeds one third. About 2200 of the fragments are considered to be replicates of only 7 identified institutional seals.

[26] Wegner 2001: 78. The estimated number is based upon material excavated up to the year 2000.

[27] Wegner 2007: 300 ff, also Wegner 2001: 81 ff.

[28] The repertoire of sealings possibly related to the "pyramid builders" might be extended in the future by sealings from Wadi al-Jarf whose find was announced, but still awaits its their publication.

1.4. Exposition of general typology of sealings

A classic volume attempting to outline varieties of seals and their function in dynastic Egypt up to the end of the Old Kingdom was published by Peter Kaplony in 1977 (accompanied by further volumes dedicated to summarizing the hitherto attested seals and sealings from the Old Kingdom period), and up until today, this study serves as a referential ground for further discussions. Kaplony established a standard typology for seal designs (manifested on discovered seals and largely on the sealings' obverses) and another regarding the general form of the cretulae as well as their use, as implicated from the various marks on their reverses and the general shape of the cretulae. Both typologies are subject to further comments and modifications by scholars studying particular sealing corpora.[29]

1.4.1 Typology of seals

In the archaeology of the Egyptian Old Kingdom period, sealings constitute a unique tool for dating, as the recovered sealings are frequently imprinted by *seals* used particularly by the body of central administration. These seals follow a highly formal design displaying not exclusively, but primarily the repeating depiction of the Horus name of the contemporary ruling king in a *serekh*. [30]

Official seals

In Kaplony's typology, this type is called *official seals*, or *Amtssiegel*. The pattern of the seal is organized in vertical columns and other royal names and epithets as well as the titles of the seal bearer. One or two lines of text might run horizontally below the serekhs.

There is a consensus that new *official seals* handed over to officials contained the Horus name of the ruling monarch (who was, after all, the source of their authority).[31] Thus the Horus name of the ruler on a sealing may serve as *terminus post quem* for undisturbed contexts. There would be even higher hopes regarding the precision of the dating of contexts by official sealings if we could rely on the interpretation that all the official sealings were *reissued* after the change of the ruler. Nolan points out (Nolan 2010: 40 ff.) that Kaplony and Boochs not only hold the assumption that shortly after the ascension of the new king, older *official seals* had to be replaced by ones with the new Horus name, but that they both stress a systematic recollection of the old sealings shortly after the king's death. Nolan questions this assumption (Nolan 2010: 315–321) as he deals with the evidence of concurrence of sealings with different Horus names in the same closed context. Regardless of the rules of reissuing *official seals*, one must always consider also the possibility of a certain time span between the closure and sealing of a container, its un-sealing and opening, and the eventual disposal of the sealing on the place where it was found.

[29] Engel und Müller 2000, Pätznick 2005 and Nolan 2010 are the most extensive and most frequently used typologies for the pre-Middle Kingdom period, although the former two are actually based on rather early material. The typology of Engel and Müller is based on Early Dynastic period material, and the majority of Pätznick's sealings comes from the border of the late Early Dynastic and early Old Kingdom period.

[30] For a detailed discussion of the history of use of the Horus name in seal designs, cf. Nolan 2010: 23–60.

[31] For sake of simplicity, we omit the discussion of presumed change in the use of Horus name during the Early Dynastic Period Cf. Nolan 2010: 25 ff.

Regarding the identification of the particular agent, the standard *official seals* do not reveal the name of the holder of the seal. Still, this category of sealings identifies the individual holder indirectly by noting a combination of his at least two presentable titles and royal and personal epithets. Therefore, we may presume that officials may have had their seals reissued also during their career, particularly if the branch of their office was complex enough to give them the opportunity to title advancement.

To sum up, the change of the ruler and perhaps the promotion of an official might be considered reasons for the update (reissue) of a seal. The exact occasion for the actual reissue of the seal is still open to discussion. When Nolan dealt with one particular seal from the Pottery Mound corpus, he noted that some of the royal epithets written under the Horus names might be connected with rituals that took place at an actual historical time and which are even reflected in the royal annals (*pHrr Hp* in Nolan 2010: 175–176). We are not sure about the reasons for choosing particular royal epithets on particular seals; the reasons could be diverse, yet could the choice be time- or event-related? Epithets on seals often speak of officers being beloved by their lord, or kings being beloved by particular gods. Speculatively speaking, could the act of the actual presentation of official seals be tied to some festivities and ceremonial events?

Kaplony distinguished further types of seals, mostly along the degree to which they denote a particular ruler or a seal holder and by characteristic design.

Official's / administrative / professional seals

The *official's seals*, or *Beamtensiegel*, were common in the Early Dynastic Period. The latest evidence of their use is from the Fourth Dynasty. They bear an official's titles and sometimes a personal name. In the Abydos and Saqqara cemeteries, these seals regularly countersealed the official seals on jar sealings. Kaplony ascribed them a private context of use, while Pätznick suggested to redefine the functional context of this category of seals in the local administration (Pätznick 2005: 88).

Some seals refer to the names of facilities or places together with titles. At some point, Kaplony suggested a separate category of *administrative seals,* or *Vervaltungssiegel*, though eventually he would not object taking them as a subtype of official seals.

During his classification of the corpus of the Old Kingdom sealings in Elephantine, Jean Pierre Pätznick preferred to employ an extended set of seal types, distinguishing also *professional seals* (*Berufssiegel*) that comprised seals of various craftsmen and other professionals (e.g. butcher, singer), *private name seals* containing merely names of the seal-bearer[32], and *women's seals* (which is rather a quality running in parallel to the other categories).

The former presentation was a list of basic types of seals and focused particularly on formal seals and types that could be derived from them. A more refined review of the typology would take into account the development of Kaplony's position as he attempted to reconstruct genetic relationships between the particular seal types; such an account was already presented by Nolan (Nolan 2010: 60 ff). Kaplony, among others, suggested that official seals developed from a seal holder's anonymity to personalisation via the reference to the combination of the holder's titles. This process was supposed to counterbalance the presumed elimination of *official's seals*, which

[32] In Kaplony's terminology, they would correspond to *private seals*. Contra Kaplony, Pätznick's corpus may prove that this category was used beyond an amulet function and not merely in funerary but also in a private domestic context (Nolan 2010: 69–70).

identified the bearer by his name.[33] As Nolan hints in his review of seal typology, corpora studied so far have been functionally specific, and in their generalization as to the development of sealing categories or practice, more caution would be in place.

Formal and informal seals

The designs observed on seals can also be described as the spectrum whose one limit is represented by designs of the *formal seals* in the strictest sense (*official seals*) and its opposite, the designs which do not follow apparent rules and allow some of the seals be vaguely called *informal seals*. Informal seals may vary. Some of them show geometrical designs (e.g. a checkboard). Other seals may use sets of representations of animals, human figures, various quite crude schemes relatable to a human face, an eye, and more designs too crude to interpret. Some of the emblems on the informal seals can be interpreted as hieroglyphic signs, but in Egypt, the border between a sign and a symbol is not always clear. Already in the Old Kingdom, some of the informal seals took the form of a stamp instead of the cylinder. The seeming opposition of *informal seals* to *official seals* may induce the idea to transform this opposition in a straightforward way to a different context of their use.[34] In any case, such an "opposition" in seal designs could be pronounced in many ways and could still lie within the limits of official Egyptian administration.

Incised inscribed sealings

Some sealings, called *inscribed sealings*, are not imprinted by a seal, but marked by a set of incised signs, either by number marks or hieratic signs. This is not, strictly speaking, a type of seals, but a type of sealings; yet it is a relevant type of design invested upon the sealings' obverse which could be used to characterise the obverse on the same level as designs of formal or informal seals.

1.4.2 Typology of cretulae

1.4.2.1 "Ontology" of types

Kaplony attempted to make a general typology of cretulae based on their shape and presumed functionality. Since that time, further important corpora of sealings have been studied and published. Scholars who published larger corpora discussed Kaplony's types and related to them, but eventually they introduced their own sets of fine types (Engel and Müller 2000, Wegner 2001, Pätznick 2005, Nolan 2010) to do more justice to particular corpora, as the cretulae in particular corpora often do reflect local, temporal and functional particularities. Besides, particular studies which deal with singular types of sealings were published as well, e.g. interpretation of door sealings in Bussman 2014, or an interpretation of the use of the peg-and-string mechanism on possible granary bins in the particular archaeological contexts of the AA area of the pyramid city in Giza (cf. Witsell 2014: 34).

One also should keep in mind that the general typology mixes different levels of interpretation. Some types of cretulae refer to kinds of containers which the cretulae were applied to

[33] For the ongoing discussion of the level of formality of the Egyptian administration, or primacy of offices vs. officers, cf. reference to Kaplony's suggestion that the "Amtssiegel" in the Early Dynastic Period could have been transferable from an officer to his successor within the period of one reign. "According to Kaplony, the seal belonged to the *office* not the *official* and therefore the office represented a bureaucratic position conceptually independent from the person who filled it." (Nolan 2010: 62–63).

[34] E.g. official vs. private context of use.

(baskets, bags, jars, doors or boxes), while some types refer dominantly to features or mechanisms connected with the cretulae use but leave aside the specific kind of objects that these devices closed. The latter is a result of the fact that "[t]he largest variety of types of impressions of objects on the cretulae [...] refer not so much to the containers themselves, but rather to the different systems used to seal them: in other words, the way, in which the cretulae were placed on the container" (Frangipane et al. 2007: 69). Due to this duality, some types do overlap.[35]

It is natural then, that some types are more characteristic and thus will be recognized more often than others. This could affect statistics and make them overrepresented.

We should also be aware that some objects allow for a more definite classification, while with others we merely rule out certain possibilities while allowing some others. The presented work attempts to articulate the possibilities and uses types with a connection to modal modifiers (possible N; X or Y). The different approach chosen by authors who try to avoid any "guessing" adheres to a conservative use of typology and ascribes the definite class to some distinctive cretulae, while others are classified as more vague classes like "possible container". It is obvious that both alternatives do have an impact on the aggregate data, and none is neutral in itself. The choice of the alternative is already part of the particular methodology, but the issue is mentioned there to remind the reader that there are types that are established even due to the methodological decision related to the application of the typology.

Strictly speaking, what we called the typology could be, in a closer view, conceived as a set of rules that enables us to interpret semantic features of cretulae pertaining to their functionality. It is not a list of the self-evidently existing classes of things ("order of things"), but merely an up-to-date version of the handbook of procedures to link material traces on cretulae with locking/binding mechanisms pertaining to certain kinds of containers.

1.4.2.2 General types

The treatment of types of cretulae in the present thesis follows particularly John Nolan's work (Nolan 2010). His account of typology incorporates a discussion of other major published typologies. In addition, references to Arslantepe typology (Frangipane, ed. 2007) are included in our presentation when suitable, because, despite the fact that it relates to a different material culture, it is currently perhaps the most advanced study of cretulae.

Bag sealings

The class of *bag sealings* contains cretulae which were applied to sacks (big or small). They were pressed onto the ropes which tied the neck of the sack (Plate II.1). The requisite for such a type is the imprint of textile (or leather) on the base of the cretula; further typical features are traces of binding twine(s) on the surface and traces of folding and bunching, or patently uneven surface on the reverse.Sacks might appear also in a small size.

[35] As will be explained below, e.g. the doors could be secured by several kinds of devices with different kinds of cretulae. But some types of devices could be used to close certain kinds of doors as well as certain containers. The former makes leads to establishing a general type of door sealings (with some sub-types), the latter to establishing a general type of peg-and-string type (further differentiated to sub-types). Some types in the classification are thus non-exclusive.

Bag sealings might be confused for the *indirect jar sealings* type, where a piece of canvas covers the neck of a jar (and produces some kind of folds eventually), the neck of the jar is bound by twine, then the clay is applied over the twine and canvas. In the case of indirect jar sealings, however, we should be able to see a hint of even curvature on the surface, parallel with the twine. In Nolan's typology, the cretulae with a bunched textile surface and implied diameter under 10 cm are classified as bags, while those with a textile surface, implied diameter over 10 cm, and apparent vessel shape are classified as indirect jar sealings. Undecided cases go to the "possible container" supercategory. Still, there are some issues to be considered. Unlike with the even surface of indirect jar sealings, it is often not possible to measure the diameter of bag sealings. We therefore suggest considering all cretulae with a reverse imprint of textile and binding, which show a curved and warped surface, and which do not show distinctive features of *indirect jar sealings* as bag sealings (or possible bag sealings). This classification will be preferred in the present work.

In theory, if there were sealed leather pouches, the cretulae might look very similar in shape, but the texture would reflect an imprint of leather instead of canvas.[36] Yet leather textures have not been identified in the studied corpus from Raneferef's pyramid complex so far.

Researchers who studied sealings from chalcolithic Anatolian Arslantepe also paid attention to the correlation between the binding and particular types of sealings, resp. types of containers. For *indirect jar sealings*, usually one or two coils of thin twisted rope 2–4 mm in diameter were used, while the impression on *bag sealings* showed a diameter of 4 to 9 mm (Frangipane, ed. 2007: 382–383). This might be an inspiration for correlations which we should look for, but I would not apply them right away since there are possible differences in the way that the sacks' binding functions in certain Arslantepe types (see below).

Ferioli and Fiandra recognized in Arslantepe some further subtypes of bag sealings, resp. kinds in how the clay mould could have been applied onto sacks (Frangipane, ed. 2007: 72–77). Their type B1 is based on the idea that cretulae could also have been applied inside the mouth of sacks (Frangipane, ed. 2007: 73, fig. II.5). This type would not affect the general criterion for bag sealings too much, since there is a brunchy and irregular textile surface as well, although the function of the binding twines would change. Type B2 reflects bag sealings with the imprint of a wooden peg. The reconstruction of such a type's function is based on the type of cretula in the mouth of the bag (i.e. B1) as well. The string would be "first wound around a piece of cane or a stick which was then inserted into the centre of the mouth of the sack and held in place by the *cretula*. This procedure also made it possible to ensure a tighter closure of the sack by pushing the wooden stick into the central space after tightening the string by turning the stick" (Frangipane, ed. 2007: 77). Such closings have not been attested in Egyptian iconography so far. If a such closing procedure was used in Egypt, the situation would get much more complicated, as the imprint of a peg with coiling twines is quite a frequent feature on sealing reverses. Peg-and-string imprint constitutes a broad class of *peg-and-string sealings* which were likely applied on a broad set of containers (small doors, chests and boxes, bins, windows).

Basket sealings

There is no such class in Kaplony's typology. Nolan and Pätznick recognize basket sealings based only on the imprint of basketry on the reverse surface. Ferioli and Fiandra deal with several types of

[36] Sealings possibly used on leather pouches were reported in Emery and Saad 1939: 20.

cretulae impressed on wicker or straw lids or baskets. They point out that lids from organic materials could have been (in Arslantepe) used for baskets as well as pottery jars (Frangipane, ed. 2007: 69).

Despite the relative distinctiveness of imprint of basketry, no textures implying basketry work were identified in the corpus from the Raneferef complex so far.

Door sealings

Door sealings serve as a particularly important clue concerning the officials who worked *in situ*, because those who sealed the doors were actually present and active at the place (while sealings on movable containers are ambiguous in that respect since they might have been brought with the container from elsewhere). As there are several kinds of doors, there are also several kinds of closing mechanics and thus several types of door sealings (Plate II.2).

Some lighter doors could be closed by a string reeved through to the other side of the door and tied to a peg on the side of the jamb or on the wall. In such a case, we would see a kind of *peg-and-string* sealing, possibly with a peg of a larger diameter. For Nolan, such kind of cretulae should show the peg diameter of at least 3 cm, an imprint of the twine coiling the peg, and possibly an imprint of a mudbrick wall or jamb stucco (otherwise the more general type "peg-and-string" is applied[37]). Such a closing procedure was observed recently in the Turkish countryside (Frangipane, ed. 2007: 97, cf. fig. II.26). Imprints of presumed door pegs found in Arslantepe (Frangipane, ed. 2007: 93–97) could be small and round (Arslantepe type S1) as well as polygonal (type S2) or more or less cylindrical, but with a larger diameter of about 4 cm (Arslantepe type S3).

Other lighter doors could be closed by a lock mechanism and the cretulae could be eventually applied directly on it, as is demonstrated on the Arslantepe finds. Such sealings are hard to determine. In an ideal case, they would show an outline of the slot in the wooden locking mechanism and the strip or twine running out of the slot (cf. Frangipane, ed. 2007: 102, fig. II.29, event. 98: fig. II.27). In Old Kingdom Egypt, such sealings have not been reported, and neither are they expected, as two different and simpler mechanisms for closing doors were used (see below).

There was a possibility of applying a sealing directly onto door bolts, both for a single or double leaved doors. The removed cretulae then might show an imprint of the wooden surface of the door bolt and sometimes also an imprint of a bracket holding the bolt on the doors in perpendicular position to the bolt. A good illustration can be found in Engel und Müller 2000: 42, Abb. 4, T1. Pätznick has further distinguished subtypes of this kind of cretulae, namely type Tv.1a-c according to the type of the doors (single or double leaved) and to the placement of the sealing (Pätznick 2005: 56 f., also Tafel XIII, p. 244).

The most recent contribution to the study of door sealings was presented by Richard Bussmann (Bussman 2014), who discussed a type of door sealing which shows a string running in parallel with the bolt slot (the string was used to pull the bolt back from the slot in the door jambs, cf. Bussman 2014: 97, fig. 3 for the picture of the cretula and 99 f., figs. 4 and 5 for the schematics; also Plate III.1). This type builds up on studies of locking mechanisms published by Königsberger (Königsberger 1936) and seems to correspond well with the bolt slots which could be noticed, among others, in stone doorframes in the mortuary temple of Sahure or in the mastaba of Ptahshepses up to the present time. It is suggested to have been used for the one-leaved doors.

[37] Nolan is stressing a cautious approach here, even more given the aforementioned importance of the door sealings type for resulting interpretations (Nolan 2010: 101).

For the analysis of cretulae from the Raneferef pyramid complex, all the sealings showing the typical features of the peg-and-string type will be initially classified generally as peg-and-string. Only after enough samples of this broad type are recorded will a distinct subtype be suggested.

Peg-and-string sealings

This type relates to the mechanism of securing a door or a container by sealing the twine coiled around a (wooden) peg. This kind of closing could be used i.a. on wooden boxes (Plate III.2). Recently peg-and-string sealings were connected also with the closing mechanics of grain bins in area AA in the pyramid city in Giza. In Near East and Anatolia, strings around pegs were probably a part of the closing mechanisms of bags.

Nolan suggested that finer pegs might have perhaps belonged to boxes and furniture, while doors (Plate II.2 A) and windows could have used crude ones (Nolan 2010: 111). We also may distinguish some peg-and-string cretulae with different "bases" and thus presume that some were attached to walls, while those attached to wooden boxes retained the year rings of the wooden surface (such features may help us ascribe a more concrete type of box sealing to a cretula).

In the present study of the corpus of sealings from the Raneferef pyramid complex, the following criteria were used for the identification of this type. A cretula of this type often features a generally round shape (actually many fragments were obvious parts of conical cretulae, with preserved parts of the base rim and the base surface). For classification as a peg-and-string type, marks of the axial object (peg) should also be preserved together with imprints of one or more coils of twine, passing perpendicularly across the peg. Sometimes the twines were in direct contact with the peg (the imprint of the twine cuts into the imprint of the peg), and sometimes they were on the broken side of the sealing fragments. If all these features were present, the sealing can be classified as *peg-and-string* (PS) sealing. If a majority of these features were present, but there were some doubts, often regarding the peg imprint, the sealings might be *peg-and-string* (mPS) sealings. If a sealing showed a round shape and traces of twines with an axial orientation like a coiling, but the peg cannot be seen, it was classified as *implied peg-and-string* (iPS) sealings. Several cretulae in the corpus showed some hints that the cretula might have been attached on two pegs, bound together by twines. This feature would be the subject of further study, and candidates for such a subtype were marked as *two-pegs-and-string sealing* (2PS) or as such that might be *two-pegs-and-string sealing* (m2PS). Sometimes the relation of the pegs is perpendicular, and sometimes they cross in an acute angle. The *two-pegs-and-string* sealings do not refer to flat boxes with a pair of pegs, known from the Middle Kingdom.[38] Actually, if the twines were sometimes coiled around the intersection of two pegs, it might explain some unsure instances of PS sealings in which the orientation of twines did not fit into the expected PS pattern.

On some cretulae in the studied corpus, the peg imprint was cut by a fine coil which did not show standard features of twines (torsion or traces of individual fibres) and gave the impression of an eyelet instead of a simple twine coil. At the moment, it is not clear whether this feature really indicated a different kind of securing the peg, but the candidates were marked for further study.

Some cretulae found in the corpus from the Ranferef's pyramid complex are candidates for a specific subtype of peg-and-string sealings. They preserve an imprint of an axial object and coiling twines, but it is clear that they were likely formed by a "cake" of clay plastered around the part (sic!)

[38] Cf. below in the subsection in box sealings.

of a diameter of a peg with wound-up twine.[39] Such sealings were shown in the literature (e.g. type S for door sealings from Arslantepe in Frangipane, ed. 2007: 92, Fig. II.22; perhaps also sealings from a grain bin from area AA in Giza according to a drawing in Witsell 2014: 34).

Imprints of "pegs" vary in terms of their profile and diameter. Actually, both are difficult to read with certainty given the fragmentary state of preservation of the peg-imprints and lack of parallel orientation of pegs to cretulae surfaces. Some bigger "peg" imprints were surprisingly shallow. This feature needs to be further investigated, but tentatively it might be explained by a presumed habit of securing only part of the diameter of the peg on some types of containers or doors (cf. above on "cake" subtype).

Sometimes the imprints of potential pegs are ambivalent and cause worries regarding possible confusions. It cannot be excluded that some "pegs" might be confused with other traces, e.g. small traces of jar rims or potential lids.

Box sealings

As mentioned above, box sealings could be a subtype of the peg-and-string cretulae (again Plate III.2), with marks of wooden surface on the base (not on the peg). Some typologies (Pätznick, Engel and Müller) suggest that any sealing with a flat surface and imprint of wood is likely box sealing. In some instances, the knob or peg was part of the mechanism.[40] In the present study, sealings with traces of pegs and knobs are preferentially considered as peg-and-string sealings, with the prospect of further analysis of the subtypes of this type in the future work. Sealings securing a peg with perpendicular crossing of twines on flat surface show a typical pattern of fragmentation: they tend to break along the twines to quarters (Nolan 2010: 97).

Published typologies of Pätznick and Nolan also discuss the closing mechanism of boxes based on two pegs tied together by twines. Sealing securing such twines does not have to be in contact with the wooden surface of the box, or with any pegs.[41] They are common in periods from the Middle Kingdom on, but their existence in the Old Kingdom period is a matter of discussion. Pätznick considers them currently unattested in the Old Kingdom (Pätznick 2005: 43), while Nolan emphasizes that the problem pertains not to unattested sealings *per se*, but to difficulties in their unambiguous identification in the first place (Nolan 2010: 95). While this is true, and candidates for potential sealings of such kind do exist, Nolan's reaction does not deal with the problem of evidence for the specific kind of containers in the Old Kingdom period, which might have been the original point of Pätznick's reservation.[42]

[39] This subtype complements the original notion of the robust round (conical or lentiloid) peg-and-string sealings, which are pictured as fully enclosing a peg.

[40] Nolan suggests that the number of securing twines should be taken into consideration. "Box sealings show multiple strings, often in sets of two or sometimes four. Peg-and-string sealings typically show a single cord or string wrapped around a single peg" (Nolan 2010: 96). Despite the difference, "both methods were used to secure boxes" (idem.).

[41] The mechanics could be illustrated on a model box from the carpenter's shop model from the tomb of Meketre. Cf. Winlock 1955: plate 28, 68 and particularly 69C.

[42] "Das im MR sowie im NR bekannte Doppelknauf-System scheint dabai im AR völlig unbekannt oder zumindest nicht gebräuchlich gewesen zu sein" (Pätznick 2005: 43). For a further balanced note cf.: "Inwiefern hier ein entwicklungsgeschichtlicher Prozeß auzumachen ist, bedarf erst einer eingehender Untersuchung des

Jar sealings (including stoppers, toppers, and lids)

In our corpus, basic types of *direct*- and *indirect jar sealings* and *stoppers* have been identified.

The mouth of a jar was usually covered by a piece of textile (possibly also leather) which was secured in place by binding (twines, but thin strips of cloth are attested as well) tied around the jar's neck (Plate IV.1). Cretulae were then attached between the rim and the shoulder of the vessel, where they secured the binding on the cloth (while there were vessels, e.g. beer jars, which were covered both on their neck as well as on the top, there are also kinds of cretulae that covered only a certain spot on the neck. The limited application of clay would be in accordance with the process of the repeated opening and closing of storage vessels). This type is called the *indirect jar* sealing. On the sealing fragments, we may observe the curved shape of the cretulae as it follows the perimeter of the neck – if the sealing fragment is long enough, the diameter of the jar rim might be deduced. The reverse of the cretula shows a textile imprint on the surface, split by marks of binding following the neck of the jar. The textile could be folded, but generally it should follow the curve of the perimeter (so we can distinguish the indirect jar sealing from the bag sealing). Often the side profile of the neck of the jar may be observed. In the corpus from Raneferef's pyramid complex there is, among others, an atypical piece of indirect jar sealing (P7200h) which shows an odd feature: the binding twines that would be expected above the covering cloth – that is in the direct contact with the cretula – are contrary to the type definition covered by the cloth. The binding around the jar neck is thus imprinted into the cretula's surface indirectly, showing through the ripple of the cloth cover. One could presume, that perhaps a large piece of cloth cover was loose on the rim side and it was secondarily folded across the original binding (Plate IV.2).

A variant of the latter type is a *direct jar* sealing. The difference is that the cretula does not show the texture of a cloth, and instead the cretula was attached directly on the neck of the jar itself.

Some jars bore cretulae in their mouths or above the rims as *stoppers*. The rim could be covered by a ceramic shard, mostly flat, usually worked to a roughly hexagonal or trapezoid shape. Onto this shard, the clay was applied in the shape of a little mound to cover the mouth of the vessel including the shard. This type of sealing has a significantly bigger mass comparing to other sealings, as it used a lot of clay (Plate V.1). A different kind of stopper could be made by putting an amount of clay inside into the mouth of the jar. Sometimes, traces of textile on stoppers' reverses show that the cloth perhaps covered the mouth similarly like with the indirect jar sealings (Plate V.2). A particular candidate for such a type from the corpus from the Raneferef pyramid complex might be the cretula P6808a, which showed very even, flat to slightly convex reverse side with the imprint of textile and twines leading both through the mass of the cretula and along its reverse (Plate VI.1).[43] Sometimes

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in Ägypten gefundenen archäologischen Materials, ist jedoch aufgrund der bisherigen Beleglage nicht auszuschließen" (Pätznick 2005: 43, note 424).

[43] Ali Witsell (personal communication) kindly brought my attention to the fact that the existence of twines inside the mass of cretula might be a hint of other functionality. In cases, where twines go through "inside" the cretula instead of merely imprinting the reverse, one should consider that its primary functionality is not to secure twines in a particular place of the surface of the container, but to merely keep those twines together. Such cretulae would constitute a new type called *bulla*. A bulla might still secure the loose ends of twines used to tie something (e.g. a bag) against meddling, or (and) it might hold some information by the container (imprint of a seal, inscription etc.). In Pätznick's typology, objects of similar functionality but a different form are described as type Tb. 3 (cf. Pätznick 2005: 53 and Tafel IX, mitte).

there are peculiar imprints inside the mouth from objects like pairs of rectangular pegs (Plate VI.2). This could be caused either by solid objects inside the jar, or – as suggested by an analogy from Arslantepe – by the practice of putting a few sticks inside the mouth of a jar to keep the clay from falling inside the jar. It can be presumed that a peculiar kind of thinned rim observed on some cretulae which could fit into this type could be formed by pushing the clay inside the mouth of a jar.

In general, all types of jar sealings required significantly more clay substance than other types of cretulae, and very often they used either crude, low quality clay or yellow marl. Stoppers then provided enough space for imprints; they usually accommodated multiple imprints of cylinder seals and often manifested the shape of the whole perimeter of the cylinder. On the other hand, imprints in crude clay tend to be eroded and generally of the poorest quality.

Analogies from Arslantepe shows that the seals on jars could sometimes be attached also on top, but in the direct vicinity of the rim. They would not secure the twines around the neck of the jar, but the twine(s) going across the mouth of the jar. Sometimes the cloth surface may mark such a kind of closing. The round shape of the rim may be another clue for identification of this type. As the rim could be partially imprinted into the sealing and the twine was also perpendicular to the rim, this type might be confused with the peg-and-string type. Perhaps the overall shape of the cretula could be a clue to distinguish the two types. Perhaps a significant flatness might serve as a hint to identify a piece from the top of the jar.

Document (papyrus) sealings

This type contains sealings with an observable texture of papyrus on the reverse side of the cretula (i.e. checker consisting of squares with imprints of fibres with alternating orientation). The cretulae may show traces of binding, as some papyri used to be folded (in the way we know from old Egyptian letters and scrolls). The end of the papyrus scroll might "cut" into a clay. In published typologies, these cretulae may be referred as *document sealings*.

When thinking about the evidence of the written administration, one should consider that archival documents did not have to be archived in place sealed individually (Plate VII.1), but could have been placed in sealed boxes or cases.[44]

Concluding remarks

At the end of this brief presentation, one might return to the conclusion of the reflection on the "ontology" of types and repeat that this study prefers to stick with the fuzzier typology employing modal nuances instead of assigning uncertain sealings to vague classes like "possible container", despite the fact that the reasons for their use are not contested. In the actual state of typology and

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Bulla functionality was one of the options considered also in case of the piece P6808a. As for the twines, one is visibly on the surface of the reverse side; others which go "through inside" could still originally run across the mouth of the small vessel and get inside the cretulae, which would function like an indirect stopper due its slight bulging into the mouth of the vessel. The mouth of the small jar (about 6 cm in diameter) would also explain the relative regular outline of the cretula. The clear imprint of the cloth (without any smearing) on the reverse would be peculiar if it were caused by the mere contiguity of the hanging bulla and the cloth surface. I therefore eventually followed the model from the Arslantepe typology and interpreted P6808a rather as an indirect jar sealing from the mouth of the jar as described above.

[44] Cf. Verner 1995: 24 and Posener-Kriéger, 1994: 315 ff. and Pic. 1–5. Sealed chests are attested in the Abusir papyrus archives; however, their content is not specified in the texts.

particularity of the subcorpus studied in the present work, I find more beneficial to accumulate all likely candidates for particular types to prepare sets for further studies, pertaining to type homogenies, correlations, and differentiation. In my opinion, our typologies are still "works in progress", and their quantitative results should not be taken at face value without a knowledge of their subtle catches. For any attempts to use results of the distribution of particular types, it is worth repeating that different types of cretulae also differ in the degree of how well they could be detected, which could result in relative under- or over-representation of particular types.

The study of sealings must be complemented by continuous study of the material culture (including depictions of various containers, etc.) in order to gradually advance our understanding of the cretulae's function and relation of particular cretulae to particular containers. A great amount of such work has already been undertaken,[45] but with every new find and each new functional context our study of the typology should be reconsidered and developed further.

[45] Pätznick's outline of the typology of cretulae (Pätznick 2005: 13–63) already contains a rich list of references (both archaeological and textual) to the kinds of containers and their use. His references are embedded into the typology organized according to Elephantine material.

2. Methodology of documentation

The presentation of the typology of cretulae in Chapter 1 showed that the documentation of cretulae from the subcorpus of the Náprstek Museum will eventually require the creation of a specific typology adapted to the particularity of the corpus of cretulae from the Raneferef pyramid temple. The approach to the methodology of documentation should therefore be analytical in nature.

The following subsection (2.1) will discuss the general method of documentation as a commented list of aspects which were documented. The list focuses primarily on the physical aspects of cretulae as well as on the features that could be observed on the cretulae's "reverses". Subsection (2.2) will present a commented list of the fragments of seal designs that were documented on sealings under study. Subsection (2.3) will present a list of "typologically important pieces of cretulae" (TIPS), meaning cretulae which were selected due to their importance for the further study of the typology of cretulae[46] either as illustrative representatives of particular types (both identified and hitherto unidentified), and cretulae preserved as whole pieces.

A discussion of the methodological questions pertaining to the interpretation of the distribution of documented features will be presented in Chapter 3, together with the results.

2.1 Documentation of cretulae

The text below discusses issues pertaining to the general documentation of cretulae as pursued by the author on the material from the Raneferef pyramid complex. This is followed by a listing of mostly the particular aspects of documentation pertaining to a reconstruction of the functionality of cretulae and to their classification within given typologies.

2.1.1 Whole pieces and fragments

Whether or not a cretula was preserved as a whole piece was recorded, since this feature is especially valuable for reconstructing and classifying fragmented sealings (cf. TIPS). In some cases, if the fragment suggests that it represents a significant part of the sealing of a known type (half or quarter, according to the hitherto known characteristic patterns of fragmentation), a note to this effect was made in the study documentation. Again, this was done for the future study of average characteristics (e.g. a mass) of particular cretulae types in the event that the data set becomes large enough during the further study of the material.

2.1.2 Conceptual representation of fragments

The description of fragments opens the question of their relation to a whole cretula. When one tries to describe a fragment (or to represent it pictorially, cf. below), one has to make decisions pertaining to the spatial orientation of the fragment and its possible position in the original whole. In some cases, the shape of the original cretula is apparent, but in many cases the fragment needs to be described without a prior estimation of its origin. While we have thus far spoken simply of "obverse" and "reverse", the majority of studied fragments are three-dimensional objects that cannot be easily reduced to a 2D scheme of, for example, a coin; some are even difficult to describe in terms of *regular* three-dimensional objects. The fragments also lack a "natural" orientation, which makes a verbal description difficult. Words such as "front", "back", "side", "base", even or "reverse" lose their

[46] I am thankful to Ali Witsell for her suggestion of this practice.

precision when applied to physical objects of different shapes whose orientation shifts on case-to-case basis.

When it was possible, attention was given to noting clues pertaining to the orientation of each particular object as well as to clues pertaining to a continuation of the original cretula before the fragmentation: objects were checked for the presence of a possible *base*, i.e. the surface where the cretula was in original contact with the container (some types are more complicated; cf. below for an example.) Then, in working sketches, the potential *good ends* were marked. These are the edges or endings of the fragment which are patently original and could be distinguished from edges created during both original and further fragmentation of the cretula.[47] The *good ends* thus preserve parts of the original shape of the cretula (it is not exceptional that the fragment of a base continues up to a good end, particularly on the fragments that betray the foot and the lower part of the coat of a cretula of possibly a conical shape.)

It was also noted whether the fragment is strikingly flat or round, thin or thick, resp. strikingly three-dimensional (such as e.g. a part of a cone likely involving a peg, rather than just a slightly convex lentil or a flat piece), since such clues could be helpful in at least excluding some types from the interpretation or hint at a possible general shape of the original cretula before the fragmentation.

Sometimes the combination of a markedly thin base, a generally flat character of the fragment, and eventually more potential bases gives reason to suspect that a set of cretula was more complex, perhaps connecting several surfaces of various orientations. In such case, the bases might be recorded in working notes as *serifs*.

2.1.3 Measurements of objects (dimension and mass)

Dimensions of cretulae were measured at a precision of 1 mm. This feature was supposed to give a general idea of the relative size of fragments; particularly in the case of whole pieces, it could help assess the average sizes of particular types. There is a chance that this would later help us assess the proportionality of the fragment to the original cretula.

The value of such a measurement is undermined, however, by the fact that fragments rarely possess a regular shape that would be best represented by three measured sizes of a regular block-like object. Most pieces are measured as they would lay on the desk, and parts of them allow themselves to be oriented as they were originally put on the container (if their base is revealed); nonetheless, this reconstruction is still hypothetical and some cretulae could have more potential "bases" as they could have been stuck between surfaces with different orientation (cf. above).

Such conditions devaluate the use of size measurements for further analyses regarding both the part/whole relationship and the search whether the particular functionality could be correlated with the particular size of the cretula. To overcome these limitations, the masses of the fragments were eventually measured and used to express the "size" of the fragments in a less haphazard way.

2.1.4 Pictorial representation of fragments

The problem of the uncertain orientation of some of the fragments (cf. above) also affects their depiction. In the past, when the depictions mostly focused on documentation of the impressed seal

[47] By the original fragmentation, we refer to the act of breaking the seal during the unsealing of the container or door. Further fragmentation happened afterwards accidentally.

designs, the fragments were oriented to enable the easiest reading of the imprinted parts of the seal design.

In some cases, however, it is obvious how the fragment fit into its original shape and how the cretula was attached to the container. It would then be natural to draw or photograph the piece as a part of such a whole. In other cases, we do not know this, and the fragment is oriented merely as it lies on the desk.

It is also difficult to set any general rules for the depiction of all cretulae, since the fragments vary in shape, and important details are revealed from different points of view. This also holds true for taking photographs. It is rarely sufficient to take one picture of the reverse and one of the obverse from above, as if it were a regular flat object. Details are often visible only under a particular angle of light and have to be checked under different lighting conditions, because a particular lighting setup may sometimes create a false impression. This applies both for some of the details on the reverse as well as for the evaluation of the traces of the seal design on the obverse. Besides the fact that the play of light and shade shows different lines of the particular inscription, different fragments of seal imprints are only seldom suitable for just a single point of view, since they imprint a surface that is rarely flat.

2.1.5 Material imprints

A significant number of cretulae show some kind of back surface (base), but without much detail. The base could be generally flat or uneven, smooth or rough. Sometimes patterns on the reverse may be spotted. There are characteristic patterns for wood, textile, papyrus, and leather. Sometimes such patterns are observable on other details of the cretula, e.g. a wood pattern on some imprints of a peg.

Impressions of surfaces may be an important clue to determine the kind of container that was secured by the particular cretula.

Traces of dense parallel tree rings imply that a cretula was applied to a wooden surface (Plate VII.2), or that it was in a contact with a wooden peg. In wood, further details (possibly traces of cracks) could be observed. In some studies, researchers were able to identify imprints of pommels of individual doors in the storage block and discuss some suggestions regarding the time horizon of their use on the basis of the evolution of cracks in the imprinted wood, resp. the lack of such evolution, or on the basis of wear-off from an imprinted rope from the closing system (Ferioli et al., eds. 1994: 300 f.).

Textile imprints are easy to recognize (cf. Frangipane, ed. 2007: 391, fig. V. 4), consisting of a matrix of wefts and warps; often one may observe whether and how the orientation of the cloth turns. The imprint of a textile is a condition for the identification of indirect jar sealings (Plate IV.2 or VI.1) as well as bag sealings (Plate VIII.1), but thin strips of cloth could also be used as a binding.

Papyrus has a characteristic fine feature that can be recognized provided that the imprint is fine enough. It shows as a checker pattern with alternating orientation of the organic fibres.

The surface of leather should be observable (cf. Frangipane, ed. 2007: 393, fig. V. 5), but none were identified with certainty in the corpus under study.

Basketry has a very characteristic signature (cf. Frangipane, ed. 2007: 88 f., fig. II.18–II.19), but no such imprints were observed in the corpus so far (not even uncertain ones).

One might encounter imprints of a ceramic surface, particularly in the case of so-called direct-jar-sealings (Plate VIII.2). The surface is usually smooth, but this type is generally identified on the base of other qualities (profile of the jar).

John Nolan also recognizes a wall surface. This may perhaps become a relevant interpretation of at least some of the number of cretulae that show a flat surface, either fine or a little rough, but without further recognisable features.

This list of surfaces summarizes the types documented in the literature used in this study, but it is certainly not exhaustive regarding the materials that used to be, or could have been, in contact with the cretulae reverses (cf. stone vessels, golden foils, matting, etc.).

During the study of the material, one eventually encounters odd traces which do not fit any expected set of patterns. Some of them could be explained if we keep in mind that, while the imprints described above are of a "static" kind, some traces could also be the result of "dynamic" acts of imprinting, resp. of the motion of the clay along the material/object.[48]

2.1.6 Traces of binding

Binding is a feature of most cretulae (Plate IX.1). Imprints of twines (ropes, cords, strings)[49] could play an auxiliary role in the typological assessment. In several cretulae, the actual material remains of twines are preserved (e.g. P6808a). Not all bindings are made of cordage, however. Sometimes strips of cloth or leather are used as well, and some marks also suggest the use of organic material: thick flat reeds and other thinner pieces (either straw or strips of reed). Even a fine wire could be an option.[50]

Attempts were made to record the diameter of some of the twines from their imprints to check if cordage of multiple thickness was used (and perhaps if twines of particular size could be correlated with specific contexts of use.) This feature was not recorded systematically though, due to the imprecision of the collected data. The twine itself could create an impression of varying diameter depending on other conditions, such as straining and pressure (Frangipane, ed., 2007: 381, note 1.). Moreover, twines are typically twisted, which makes it difficult to measure the exact diameter of the twine; the imprint actually consists of an interrupted sequence of diagonal oval slices. An estimation of the diameter becomes even more complex if the twines are not in a straight line, so the determination of points whose distance should be measured remains quite subjective.[51]

The presented study has not yet gone so far as the researchers in Arslantepe, who, among other things, distinguished Z and S spin of twisted twines and considered different origins and perhaps a different context of use of those kinds of twines (Frangipane, ed., 2007: 383 f.).

This study tried to focus primarily on the orientation of twines instead, and on their estimated function. Do the twines coil around some estimated axis? Do they cross, or are they

[48] Ali Witsell, personal communication.

[49] In the present work, I use the terms rope, twine, cords, and string as synonyms. Others may use them in a more technical way and relate each of them to the particular diameter of the string.

[50] Cf. the fine gold wire used to encircle the rim of the squat magnesite jar covered by a thin gold foil and to attach a clay sealing. Find from the tomb of Khasekhem in Abydos. British Museum EA35567.

[51] Precisely in these cases, moulds of reverse sides can be of great help.

perhaps tied in a knot? Do they intersect some other objects (particularly pegs)? Do they only run along in a straight line? Are there multiple (parallel) lines of twines, or just one? Are they on the surface of the sealings' reverse, or are they deeper inside the clay, and why? Are twines visible on the fragmented sides (actually they quite often are, and the fact that some seals are fragmented along the lines of cordage makes sense since they impact the structural integrity of the clay)? In rare cases, the imprint of twine is seen on the "obverse" side – why is it so? Is it just the loose end of the twine that was stuck onto the cretula, or do the marks allow us to speculate that the twine had originally run through but was plucked out during the removal of the sealing from the container? These features were considered during the study and explicitly recorded to the study notes in cases when the traces were well observable, and when the description could play a role in the estimation of the type of the cretula or in the description of its functionality.

2.1.7 Other details related to the sealings´ reverse

Possible pegs were recorded (cf. above in chapter 1.4.2.). If possible, the pattern attesting the material of the peg (wood) was noted. The imprinted diameter of the peg (resp. the diameter of its fragmentary imprint) was recorded (the imprints typically do not show the whole diameter, and some of the imprints are markedly shallow. They differ nevertheless and are worth investigating). In some cases, the attempt was made to note the orientation of the peg in relation to the rest of the cretula in the working notes or working sketches. It would have been useful to record the profile of the peg, but actually this proved to be problematic since the perception of their profile changes considerably given the point of view, resp. given the estimated orientation of the peg's axis. The perception of the profile of larger pegs typically varies between a "U" shape and the shape of a rounded hexagon. Apparently, it would be possible to differentiate a few subtypes of "pegs". Some pegs are patently thinner than others while some are oddly shallow. Given the fragmented nature of the impressions, there is still uncertainty whether some of the potential peg imprints could have been created by rims of vessels instead. Further differentiation of the evidence of *peg-and-string* sealings is much needed.

Potential imprints of jars were recognized on some fragments. Fragments that came from the necks of jars are usually well identifiable. Cretulae that could have been theoretically applied across the rims or handles of vessels need to be revised along the further study of the peg-and-string corpus to prevent possible confusion. The further identification of jars would be consulted with a ceramic specialist in the future.

There were rare cases in which the imprint of a (smaller) peg was interrupted by one or a pair of perpendicular coils which did not show a twisted surface typical for twines. They were noted as possible cringles, since they gave the vague impression of the closing mechanics known from the later period (e.g. on fine boxes from the Tutankhamun treasure). The fragments will be the subject of a further revision study upon a processing of the whole corpus, and no conclusion was drawn regarding the validity of this observation.

2.1.8 Deformations of cretulae

Recurring deformations of the preserved cretulae may be attributed to the act of removing them in a wet state. In studies conducted upon the material from Crete and Turkey, this was taken as evidence of the container being re-opened within 24 hours, and thus the hint of daily use of the container, resp. door (Ferioli et al., eds. 1994: 301 n., Frangipane, ed. 2007: 68, also Frangipane 2016: 28). The time required for a clay to dry may vary; this might happen even faster in Egypt, and the time

required should be tested by experimentation. Even in the climate of Turkey, the time of drying the cretula changes according to the annual season.[52]

In rare cases, the deformation could take the form of the folding of the cretula as an effect of the intentional crumpling of a failed sealing. The characteristic feature of such an object is that the sealed obverse is turned inside. In Egypt, such cases were reported e.g. in the Pottery Mound (Nolan 2010: 310 f., cf. Fig. 3.4) and in one case also in the Raneferef pyramid temple (cf. Verner et al. 2006: 235, No. 116).

In both cases, such deformation could hint that the particular cretula was likely the result of a local sealing activity and was not transported into the area from outside on the sealed container. No such objects were identified in the corpus under study; the latter cretula from the Raneferef pyramid temple is part of the subcorpus kept in the Egyptian Museum in Cairo.[53]

2.1.9 Find context

Information about the find context of fragments were copied from the excavation documentation (from the find cards), recorded in the early 1980s by M. Verner and his team during the exploration of the Raneferef pyramid complex. The find cards group fragments into sets of varying size on the base of the shared find context (room or a place within the room and the layer). The written record explicitly states the room and the layer where the sets of the fragments were found. Usually, the information is complemented by a further description of the character of the layer and the position of the finds within the given rooms. The plans from the excavation would allow to define the area where the objects were found with more precision.

2.1.10 Options not included in the current study

To ensure the safety of the fragile objects made of unbaked clay, the arrangement of the study in the museum did not include making moulds; instead, several cretulae were selected for future experimental CT scanning.

The use of pXRF to provenance the clay was briefly considered, but the idea has been put aside for the moment. Portable X-ray fluorescence is used e.g. to identify the place of origin of the used clay by comparing the ratio of rare elements in the clay objects with the ratios characteristic for particular regions, provided that comparative datasets have been collected. In academia, this method has been used e.g. by Edward Stratford to verify the relationship between the places of origin of clay used for the cuneiform tablets and the presumed places of origin of Assyrian business letters written on the respective letters.[54] In theory, incoming cretulae could be distinguished from those produced on site, provided that the distance was significant enough to show up on the chemical signature. Given the fact that the establishment under study is located in close proximity to relevant outer institutions (royal residence, sun temples, temple of Ptah in Memphis), this method would hardly have the opportunity to show its potential with our material. Moreover, the clay in the

[52] Francesca Balossi Restelli, personal communication.

[53] The cretula P7199d was the only other piece from the subcorpus under study for which partial folding was considered, but this is not a case of discarding folding from the outside-in, and overall the case seems to be inconclusive.

[54] Edward Stratford, the talk “50 Shades of Clay: Using pXRF to Advance Research on Ancient Assyrian Trade” given at Charles University in Prague on 6 Nov 2015.

Nile Valley is deposited *en masse* every year due to the Nile floods, and such conditions might make this method unusable.

When a well-preserved imprint of fingerprints was identified on one cretula, the question of the possible recording of fingerprints was brought about. Eventually it was shown that although papillary lines kept by cretulae are not so rare, in almost all other cases they are smeared; they are dynamic imprints and do not capture the characteristics of individual fingers.

Plans to use photogrammetry or exact measurements of details to help in the reconstruction of theoretical seals were quickly shown to be too naive. Rolling a cylinder seal is, to some degree, an individual act where the pace of the movement, the pressure of the cylinder, and various accidental events could play a role. Many sealings demonstrate that sometimes one end of the cylinder will move at a faster pace than the opposite one, thus distorting the distances within the design. Another problem which practically rules out an *exact* photodocumentation is the curvature of the sealing obverse, respectively the irregularities of its surface. If there are imprints of several rolls of the cylinder seal, they are almost never aligned in the same plane. As was mentioned above in the note on the problem of sketches and photographs, cretulae obverses can be fully represented from a single point of view only occasionally.

Final remark:

The methodology used for the presented thesis is limited in scope so that it could be conducted by a single person on objects kept in a museum within the time period granted for the master thesis.

For a more ambitious aim, one might recall some of the aims of state-of-art documentation as proclaimed by Ferioli and Fiandra (Ferioli and Fiandra 1990) to fully harness the “turn to reverses”. Ideally, the publication of cretulae should provide photography of the reverse as well as of the mould of the reverse side, and a reconstruction of the sealings’ use should follow. This should complement the drawing and photography of the obverse as well as the finding place of the object. “If possible, a tentative graphic reconstruction of the sealed object should be given in order to show how each clay sealing would have been employed. If this information is lacking, it is hazardous and misleading to study and compare the given material” (Ferioli and Fiandra 1990: 221).

The author therefore hopes to elaborate his documentation further in the future with the necessary help of the Náprstek Museum.

2.2 Documentation of seal imprints

Along the process of documentation of reverses, the obverses (the seal imprints on the sealings from the Raneferef pyramid complex) were collated with the drawings in the excavation documentation and, when possible, also with the publication.[55]

In the current study, the features on the obverses were noted for two purposes:

1) To check for potential titles or fragments of titles that could be used in analysis.

2) To check for features which could be uncommon enough to help identify individual seals.

The former and latter features could be of hieroglyphic or iconographical nature or ambiguous (the commented list of observed features is organized into subsections to comfort the reader, but the difference can not be taken strictly; it is not deemed essential to put a sharp difference to an area where it would be artificial).

Observed markers could not have been selected in advance. They have emerged as operational attributes during the study of sealings' obverses and during the collation of the obverses with the drawings in the excavation documents.

As for the methodological approach, the presented work follows up on the ideas of Miroslav Verner and John Nolan. In the publication of the selected sealings from the Raneferef pyramid temple, Miroslav Verner already noted distinctions often related to crowns worn by the falcon on the serekh and to various iconographical features on the upper register of serekh in general. Seventeen such features were defined (Verner et al. 2006: 270). John Nolan (Nolan 2010: 134, Fig. 2.1) distinguished subtle differences in the depiction of serekhs, resp. eleven kinds of depiction of niches in serekhs within the sealings from the Pottery Mound corpus and successfully used these differences in the reconstruction of individual seals. Both authors focused on the serekh elements as they form the most prominent feature of official seals (see further chapter 2.2.2).

The current study further develops this approach and concentrates on a larger variety of features. The features of sealings were studied and documented in various directions of light and with a particular focus on miniature details. Up to one hundred epigraphical markers were gradually followed during this study. It was also concluded that sometimes even the execution of particular signs vary and that even the size of signs, the distribution of space, resp. spaces within the design could become a clue to narrow the identity of imprinted seal. The former observation, together with systematic ambiguities of some partially preserved fragments of imprinted signs, brings out the question of the possible palaeography of sealings from Abusir that might be carried out in the future.

2.2.1 Titles, parts of titles and epithets, textually oriented markers

The main purpose of the following list is a) to record the observations in empirical form (so that the mistakes of interpretations could be easily found and corrected); and b) to record potential relations between fragments and in general to be helpful in the identification of replicates and reconstruction of seal designs.

[55] Only 33 sealings from the subcorpus that is kept in Náprstek museum were selected for publication in Verner et al. 2006 (cf. Chapter 1.3).

The focus to organize the data provided by the material (in their specificity) could be at the cost of systematicity of the list. As the elements were recognized as parts of longer sequences on certain fragments, the supplementary notes were provided to keep records of the affinity of certain fragments. If more specific sequences became more frequent, the specific section was added beside the general one (e.g. *xnt.j* and *xnt.j-Tnn.t*).

At some point, certain fragments appeared that kept an affinity to previously recorded fragments in their extended sequence but did not preserve the core element that defined the original section. The principle of recording the affinity between the fragments and principle of empiricity thus manifested as conflicting. For example, the sequence of *xtmw HA.t Htp.w* extended some of the fragments recorded due to the presence of the title element *xtmw*, but eventually fragments preserving only the *Htp.w* element appeared, forcing the creating of a separate section.

Several single hieroglyphic signs that were deemed by the author as less frequent were recorded as well.

On several occasions, the recorded markers were recognized as too common and of little use to record systematically (e.g. *mr*, *wD* or some of cartouches). Their occasional occurrences were still noted mainly to keep track of possible variants.

a) Titles and elements of titles

Aa 21 in a string of signs

Recorded on 3 fragments: P6819z (*wDa-mdw*?), P6797j (cf. Jones 2000: 890, No. 3257), P7200h (˹*smA*˺*a wDa-mdw n Hw.t wr.t*, cf. Jones 2000: 890, No. 3259)

Hm-nTr

A very frequent element but with varying level of distinctiveness of preserved signs. (Sometimes found as a possible element of a sequence *Hm-nTr* of pyramid complex NN, cf. bellow.)

Recorded at least on 36 fragments: P6781a, P6783a(?), P6791(?), P6796(?, uncertain), P6808d, P6818s, P6819bb (+ cartouche), P6820ff (+ O 24 above), P6822tt (detailed depiction), P6822uu, P6823xb, P6826a, P6826b, P6827(?), P6828a(?) (+ *Ra-nfr=f*), P6829f, P6831c (+ *Ra-nfr=f*?), P6831d, P6833n, P7190b(?), P7190e(?), P7190h, P7191m, P7192c (+ O 25), P7195c (*Hm-nTr Ra-nfr=f*), P7195e(?), P7196b (+ O 24), P7196c(? + perhaps ra *Hw.t-Hr m st-jb ra*?), P7196e, P7196h (+ O 24), P7196j, P7197g, P7197h (+ O 24), P7197m (?, + O 24), P7198j (+ O 24), P7199a(? + *Hw.t-Hr*?)

Hm-nTr [...] Ra-nfr=f

Recorded on 7 fragments: P6818s(?), P6819bb(?) (uncertain reading of cartouche), P6828a (*Hm*(?)*-nTr nTrj-bA.w Ra-nfr=f*), P7195c (*Hm-nTr Ra-nfr=f*), P7196b, P7196e (*Hm-nTr nTrj-bA.w Ra-nfr=f*), P7197g(?)

Hr.j sštA

Title *Hr.j-sštA "one who is privy to the secret" or "secretary"* seems to be very common on sealings from the studied corpus. Usually it is preserved incomplete and with a varying degree of distinctiveness of constituent signs. Excavation monograph seems to encourage its often reconstruction, which is quite reasonable, though one has to remain cautious as e.g.

the combinations of Hr + š is attested in the corpus as the part of the epithet *Hry-š=f* [*mry*] as well (cf. Verner et al. 2006: 251, No. 185).

Recorded on 24 sealings: P6791, P6800a, P6803d, P6783b, P6807a, P6808a (*Hr.j-ˁsˀš*[*t3*]), P6808d(?), P6808e, P6818s(?), P6826a, P7190a, P7190g(?), P7190j, P7191b, P7192k (?, only *Hr.j*), P7193b (without *Hr*), P7194a (not collated), P7194c(?), P7196a(?), P7197g, P7197h, P7197k(?, *Hr+r+š*), P7198j, P7198k,

[...] Htp.wt

Element *Htp.wt* was most likely used on fragments under study as a part of the whole title *xtm(w) HAt Htp.wt* (cf. Jones 2000: 772, No. 2805), but in many instances only *Htp.wt* is visible.

Recorded on 6 fragments: 6805e, P7199b (*xtm*(*w*) *HAt Htp.wt*), P7199d, P7199e, P7199h, P7199i, P7200f

xntj-š, xnt.j[...]

Either part of a title (often *xntj-š* "tenant" or "attendant") or various divine epithets ([XY] *xntj*-NN, "[XY,] one who is foremost of the NN"). Some cases in which mere possible fragment of the *xnt* sign were observed out of context were left undocumented for the sake of effectivity of the list.

Recorded on 11 sealings: P6784a (*jm.j*-[*ra*?]-*xnt.j*[...]), P6787b (*xnt.j-ˁšˀ*), P6796a (*xnt.j-š*), P6796b([...]*xnt*[...]), P6803a(*xnt.j*[...]), P6812b, P6817l ([...*xt*] *xnt*[...]), P7196g ([*xnm*?] *xnt.j*), P7197b (*bAst.t xnt.t*), P7197g (*xnt.j T*[*nn.t*]), P7198f (*xnt.j-ˁTnˀ*[...]), ...

xtm.t(j)/xtmw

Core element of the title of the holder of the seal and of derived titles.

Recorded on 9 fragments: P6784a (*jr.j-xtm.t*), P6796b(?), P6797(?, *xtmw* or *anx*), P6814b(?), P6818s (*xtm(w)-nTr?*), P6822vv (*zš n xtm*[...] *nTr*?), P7195a (*xtm.w DfA.w*), P7188e(?), P7199b (*xtm*(*w*) *HAt Htp.wt*, cf. Jones 2000: 772, No. 2805)[56]

jm.j-rA wp[(w)t ...]

Title "overseer of commissions" or possibly element of titles related to "overseer of division(s)/apportionments [e.g. of divine offerings]".

Recorded on 3 fragments: P6826a (*jm.j-ra wp.t Ra-nfr=f*), P6829a (close to cartouche of wnjs), P6833r (seal issued in Menkauhor's reign)

jr.j-x.t

Title "custodian of the property" and element of derived titles.

Recorded on 1 fragment: P7198k (*jr.j-x.t pr-aA Nj-wsr-ra*)

jr.j-mDA.t

[56] Cf. also subsection on *Htp.wt* for other fragments, which could bear the same title, but only *Htp.wt* fragment is preserved (P7199d, P7199e, P7199h, P7199i, P7200f).

Title “archivist,” “scribe’s assistant” or “keeper of documents” and element of derived titles.

Recorded on 3 fragments: P6826b(?) (*jr.j ... mDa.t*?), P7190d (*jr.j mDa.t* [*nswt*], *nj xrt-a*), P7191b (*jr.j-mDa.t ... nswt*)

sHD

Title “inspector” and element of derived titles.

Recorded on 4 fragments: P6808d(?), P6810d (+ O 24), P6817r (*sHD zš*), P6825(?)[57]

wab (A 6)

Element of the titles related to wab-priests or institution of *wabet*. The least ambiguous and so the best distinctive feature of this sign is the pair of hands bent to right angle up.

Recorded on 16 fragments: P6810b, P6810d(?), P7195e (*wab nswt*?), P7197k(?), P7197l, P7198d(?), P7198e, P7192h, P7193d, P6820gg (frag.), P6825 (+ O 24?), P6827, P6828a (in Verner et al. 2006: 219, No. 41, ⌜*wab (n) nTrj-bAw-Ra-nfr=f*⌝), P6829f, P6831a, P6832k(?)

zA (V 16)

Element pertaining to phylai and related titles.

Recorded on 2 fragments: P6830, P6783c (together with possible *wAD.t* sign and a bird)

zAb

The judge, resp. element of judiciary titles. The presence of the element is often merely inferred from the fragments due to the characteristic placement and shape of feet.

Recorded on 9 fragments: P6817r, P6822ss, P6822tt, P7190k, P7195b(?), P7196m(?), P7194a (?, not collated), P7199f (⌜*zAb aD-mr*⌝ *n* [...]), P7200d (?, *zAb aD-mr n* [...]),

zš

Core element of the title “scribe”, resp. of derived titles.

Recorded on 13 fragments: P6807a, P6810a (*zš nswt*), P6817r (*sHD zš*[58]), P6822ss (frg. of detailed depiction), P6822tt (detailed depiction), P6822vv (*zš n xtm*[...] *nTr*?[59]), P6825(?)[60], P6828a, P7195f (perhaps *zš pr HD*), P7197j, P7197m (?, + *mAa.t*), P7190k, P7192i (detailed depiction)

[57] Possibly ⌜*s*⌝*HD* + either *wsxt* or *zš*.

[58] Possibly *sHD zš* related also to *Hwt-wrt* (written with snake frieze over the rectangle). Cf. Verner et al., 2006, No. 25. (*Wsr* sign corrected to *HD* as a result of collation.)

[59] End of the sequence is interrupted by a different impression, therefore it is not possible to validate likely reading zš n *xtmt nTr (scribe of the god's treasury)*

[60] Possibly ⌜*s*⌝*HD* + either wsxt or zš.

Names of institutions, places, names and parts of epithets of gods

bA.w (G 29)

Sign with very fine details, sometimes difficult to distinguish. This element is used in the name of the pyramid complex of the king Raneferef *nTrj-bAw Ra-nfr=f*.

Recorded on 12 fragments: P6783a (*nTr.j-⸢bA.w⸣* [*Ra*]-*⸢nfr=f⸣*?, alternatively G 29 could be G 49), P6813a (*nTr.j-bAw*), P6827 (+O 24), P6828a, P6829f, 7196e (*nTrj bAw*), 7196h, 7197g, 7197h, 7198a(?, + O 24), 7198e (+O 24), 7198j

Hw.t-Hr (Hathor)

Name of a deity. It appears nearly impossible to make a distinction between *Hw.t-Hr* (Hathor) and *Hw.t-wr.t* (the great court) merely on the imprint of the sign; the estimation is largely based on the context.

Recorded on 10 fragments: P6781a, P6808d[61], P6823xa, P6829d, P6829f(?) (very uncertain), P7194e(?, estimated by publication, cf. Verner et al. 2006: 247, No. 168), P7197i, P7199a(?, + *Hm-nTr*?) P7200h(?,rather *Hw.t wr.t*), P7200i(?, rather *Hw.t wr.t*)

Hw.t-wr.t

The Great court; element of some titles. Cf. above on *Hw.t-Hr* regarding frequently ambiguous reading.

Recorded on 3 fragments: P7193a, P7200h, P7200i

xntj-Tnnt

Epithet or likely a name of a deity, cf. Dulíková 2016.

Recorded on 4 sealings: P7197g, P7198c (*⸢Tnn⸣.t-*[*mr*]*y*), P7198f (*xnt.j-⸢Tn⸣*[...]), P7200h

xnt.t-pr-jj

Possible epithet of Bastet, cf. Verner et al. 2006: 266, commentary on No. 247.

Recorded on 2 sealings: P7196e (*xnt*[*.t*] *pr-jj-mrj*), P7198c (Bastet)

Xnwmw (Khnum)

Name of deity.

Recorded on 1 fragment: P7190h (according to excavation documentation, failed to collate)

Xnw

Element that could indicate the institution of the royal residence.

Recorded on 2 fragments: P6803d (part of *pr-HD n Xnw*), P6814b (part of *pr-HD n Xnw*)

jnb-HD

Name of the Egyptian capital.

[61] Most likely *Hm-nTr* [*ra*] *Hwt-Hr m st-jb-ra*.

Recorded on 1 fragment: P7190c(?)

nb.t jmAw

Possibly the epithet of Hathor "The Mistress of Imu" (present Kom el-Hisn)? The epithet follows seated figure on throne holding the was sceptre, but only part of the figure below the head is preserved.

Recorded on 2 fragments: P7198i(?), P7198l

pr-aA

Element referring to the institution of the king's office.

Recorded on 19 fragments: P6817o, P7188, P7194g, P7197c, P7197h, P7198j, P7198k, P6810b, P6819cc (⸢*pr*⸣-*aA*), P6819aa (broad[62] *pr*), P6820ee (broad *pr*), P6820gg, P6820ii (broad *pr*), P6821kk (broad *pr*), P6821ll, P6821mm(?), P6827, P6828a (+ *zš*), P6832l

pr-HD

Institution of the treasury.

Recorded on 9 sealings: P6803d (*pr HD n Xnw*), P6814b (*pr HD n Xnw*), P7195f (perhaps *zš pr-HD*), P7199b(?), P7199e (*jm.j-x.t-pr-*⸢*HD*⸣), P7199h (?, ⸢*jm.j-x.t pr*⸣-[...][63]), P7199i (?, ⸢*jm.j-x.t pr-HD*⸣[64]) P7200a1 ([*jm.j*]-*x.t pr-HD*) , P7200b ([*jm.j*]-⸢*x.t pr-HD*⸣)

pr-jj-mrj

For an epithet *xnt(.t)-pr-jj* cf. Verner et al. 2006: 266, No. 247 (P7198c in present corpus). In the publication, the element is presented as part of the sequence *mry(?) bAst.t,* ⸢*xnt.t*⸣*-pr-jj*.

Recorded on 3 fragments: P7196b, P7196e (*xnt[.t] pr-jj-mr*(*j*)(sic?!), P7198c (*bAst.t xnt.t pr-jj*.[*mry*])

ptH (Ptah) (in textual form)

Name of a deity.

Recorded on 3 fragments: P7190k, P7197g, P7198b

sbk(?) (Sobek) – mostly uncertain reading

Name of a deity.

Potential occurrence recorded on 2 fragments: P6805a(?), P7197j(?)

st-jb [...] (+ O 25)

[62] Note related to stylistic features of the execution of the sign.

[63] Reading of this fragment is uncertain. Likely it could be *jm.j-ra* instead of *jm.j* (fragment of the sign bellow *m* resembles *r*, though *xt* is also a conceivable reading) and the pr sign is severely disrupted by a piece of charcoal. Yet the reading *jm.j-xt* would fit very well with other fragments from the same excavation number. Cf. also the note below for P7199i.

[64] Fragment is very much like P7199h from the same context. It shows less clues with respect to the *jm.j/jr.j* disambiguation and a bit more clues in favour of the presence of *pr-HD* sign.

Element of the name of the sun temple of Neferirkara (*st-jb-ra*).

Recorded on 14 fragments: P6808d, P6812f(?) (*st-⸢jb⸣-[ra]* + O 25), P6818x, P6826a (*m*[65] *st-jb-ra* + O 25), P6826b(?) (*⸢st⸣-[jb]-⸢ra⸣* + O 25), P6829h(?) (O25 only), P7191h(?), P7192c, P7193d(?), P7196c, P7197a, P7197g, P7197j, P7198g (*m st-jb-ra* + O 25)

wp-wa.wt

Name of a deity.

Recorded on 1 fragment: P7197h

wsxt

Element of a title.

Recorded on 2 fragments: P7197j (variant of the sign without complementing signs, i.e. as the variant of O 4 sign with pairs of dots outside from three sides), P6825(?) (perhaps spelled-out variant?)[66]

Other elements

anx

Sign that may appear in the epithets or name of the institution. Sometimes, similarity with the one style of depiction of *xtmw* have to be considered.

Recorded on 2 fragments: P6796b(?), P7197j

aD (K 3)

Recorded on 2 fragments: P7199f (*⸢zAb aD-mr⸣*), P7200d (in two columns, likely *zAb aD-mr n* [...])

a.t

Recorded on 3 fragments: P7190a, P7198a, P7191b

bjk nbw

Recorded on 2 fragments: P6801a(?), P6817r (*bjk nbw Dd*)

bjtj

Recorded on 2 fragments: P6826a, P6831a

Cartouche of Jssj

This form of the king's name was recorded on 1 fragment only: P6832g

[65] Alternatively jm.j-ra [*Hm-nTr* NN?] *st-jb-ra* was considered, due to the presence of the small sign below *m* that was deemed as potential r sign. Eventually the small sign could be rather *t* complementing the *st* element. The sign showed a modest likeness to the *r* sign observable further below, though it seems to be of smaller size. The fragments of feet above the text remind us of recurring title *Hm-nTr ra Hwt-Hr m st-jb-ra*. *Hm* is not visible at the end of the sequence, though it might accompany the depiction of divine pair above.

[66] Possibly *⸢s⸣HD* + either *wsxt* or *zš*.

Cartouche of Nfr-jr-kA-ra

Recorded on 3 fragments: P7197f (double border of cartouche), P7197k, P7193f

Cartouche of Nj-wsr-ra

Recorded on 4 fragments: P7195e, P7196a(?), P7197e, P7198k

Cartouche of Ra-nfr=f

Recorded on 11 fragments: P6808d, P6818s(?), P6819bb(?), P6826a (*jm.j-ra wp.t Ra-nfr=f*), P6828a (*Hm*(?)*-nTr nTrj-bA.w ra-nfr=f*), P6832h(?), P7197d, P7197g, P7197h, P7198f, P7198k(?)

Cartouche of Wnjs

Recorded on 1 fragment: P6829a (+ *nfr*), [...]

Combination of the sign O 16 with the bird inside

Element of uncertain meaning. Could it be *tAy.t-wr.t* (or *Hw.t-wr.t*)?

Recorded on 1 fragment: P6817r[67]

DbAt(?) (or S 26?)

Potential occurrence recorded on fragment P6803e.

Depiction of the writing case as a classifier

Recorded on 5 fragments: P7190d, P7190a, P7190m, P7191b, P7192a

possibly Xr conducted in fine lines

Recorded on 1 fragment: P6822tt

jmAxw

Element of the epithet.

Recorded on 2 fragments: P7200h, P7200i

mA (U 1)

Recorded on 6 fragments: P7196a, P7197j (possibly *smaA wDa-mdw n wsxt*), P7197m (*zš mAa.t*), P7200h (*jmAx*(*w*) [*xr*] *nswt*), P7200h (ꜥ*smA*ꜣ*a wDa-mdw n Hw.t wr.t*), P7200i (*jmAxw xr n*(*swt*?))

mr[...]

Recorded on at least 14 fragments:[68] P6781a, P6800j, P7196a, P7197h, P7198i, P7198j, P7198k, P7193a(?) (uncertain reading), P7200h (*mrr nb=f*), P6824c, P6826b, P6827, P6828a(?), P6829d

[67] Cf. Verner et al. 2006: 216, No. 25

[68] As a frequent element of epithets, it eventually ceased to be recorded systematically.

nfr.w(?)

Recorded on 1 fragment: P7198j(?, *nfr.w m pr-ˁaAˀ*?)

[...]nh[...]

Uncertain, but for analogy cf. *nht* in Verner et al. 2006: 251, No. 185 and 254, No. 190.

Recorded on 2 fragments: P7198a (*h* sign oriented right-to left?), P7197j (?, rather *wsxt*, cf. above)

S 1–S 6 (royal crowns above *nb* signgs)

Recorded on 1 fragment: P7292h(?)

sbA...(?), resp. sign N14

Recorded on 8 fragments: P6807b(?), P6812g, P6818t, P7195b, P7193a, P7193c(?), P7194d, P7195b

s.wt ("places")

Recorded on 4 fragments: P6810d, P6812a(?), P6812c(?), P7193e

wD

Recorded on 3 fragments: P7198i (*wD nb* ...), P6825 (*jrr* ... *wD* ...), P6826b (*jrr ˁwDˀ.w n nb=f*), ...

2.2.2 Iconographical features, classifiers and other markers

The list of largely iconographical features follows similar rules as the former list of largely textual features. The sections were added, separated and merged as the study of sealings progressed. Most of sections were recorded thoroughly; some which turned out to be too frequent and of little help were eventually recorded just on occasions to represent major variations (chiefly numbers of niche panels, some of royal cartouches and, due to high frequency and overall bad visibility, the common kinds of iconography on the serekh toppings consisting of ureus and falcon).

a) Serekhs and its related features

Only units of percents of studied sealings are of some kind of informal design; the overwhelming majority of sealings are imprints of seals of formal type, precisely of *official seals*.[69] As was noted in chapter 1.4.1, the design of official seals actually consists in the repeating pattern of alternation of columns with Horus names and columns which could present titles, epithets, or other royal names. Usually one or several lines of text or iconography are on the ends of the cylinder. To use serekh features to identify individual seals, we have to consider the internal and external variability of those features. By external variability, it is meant whether the feature changes from seal to seal. For example, the depiction of niches of serekhs seems to be, in the present corpus, more uniform than in the fourth dynasty corpus from Pottery Mound that was studied by John Nolan. By internal variability, it is meant whether the feature changes within one single seal on the repeating Horus

[69] *Official seals* are so dominant on the site that even badly preserved fragments are tacitly taken for official seals, unless traces of informal designs are visible. Cf. subsection 2.2.2.c for instances of sealings that do not correspond to the design of official seals.

names. As was already documented on seals published by Kaplony, it is not rare that one seal design alternates two variant depictions of the falcon.

Pertaining to sealings under study, serekhs remain an important feature regarding the individuality of seals, despite certain complications. The details of the falcon crowns are quite difficult to read with certainty and in general they are rarely preserved at all. The variation in depictions of niches is quite low in the corpus; they differ mostly in number of panels, usually in connection with the width of the serekh. Even though, the number of niche panels and the width of serekh could be helpful for a cross-check in cases of sealings with similar patterns, and they helped to differentiate seals with otherwise similar pattern fragments.[70]

Despite this, the imprinted serekhs eventually presented lots of variations and peculiarities that could have been recorded and considered in reconstruction of fragments of theoretical seals. The serekhs from the period of activity of the Raneferef pyramid temple sometime replace niches with emblemata. Some seals alternate pair of such emblemata, while the alternation of niche panels and an emblem cannot be ruled out. Some Horus names written in serekh are supplemented with the nomen, sometimes the combination of the royal names in serekh is spelled horizontally in two lines, and some even alternate Horus name and nomen in three columns as it seems. Also, the top of the serekh is supplemented by further features.

Horus names in serekhs were part of the basic table of objects under study which is derived from the excavation database and which forms a supplement of this work. Originally these data were meant to date sets of finds by ascribing the entire registration numbers to one or more periods of reign. After collation, these data were updated on the basis of each fragment, and the royal name was omitted where the Horus name on the fragment can not be read with confidence. (Clues pertaining to reading fragmentary Horus names were noted in working notes.)

The width of many serekhs was measured, particularly where the completeness of imprints allowed it. Tolerance of the measurement was ca. 1 mm. Again, the point was not to collect exact data (which would be hardly possible, as the precise dimensions of imprints are a] both difficult to measure and b] always affected by circumstances of individual acts of rolling the seal cylinder). The measurement with 1 mm tolerance was sufficient to distinguish some seals with otherwise similar design on preserved fragments. The measured width of serekhs vary mostly from 5 to 11 mm (or up to 19 mm in extreme cases).

1. serekh of Djedkare with three columns (ca. 15 mm wide?)

   Recorded on 2 fragments: P6815a, P6822uu (three figures above, two columns visible, third estimated from the space distribution)

2. serekh of Djedkare with names in two (or more) columns

   Recorded on 2 fragments: P6818s, P6819bb

3. serekh of Djedkare with names in two (or more) lines

   Recorded on 2 fragments: P6815f, P6821kk

[70] Both the number of vertical lines of the niche and the falcon iconography were eventually recorded only occasionally to document variations of the corpus or to cross-check the identity of seal designs.

4. serekh of Djedkare topped by a king between two falcons

   Serekh topped by a striding figure of the king wearing the Upper Egyptian crown and flanked by falcons on each side (cf. Verner et al. 2006.: 270, type 12). There may be more variants of serekhs with this topping.[71]

   Recorded on 1 fragment: P6831a (Inside serekh, there is a Horus name written in two short columns (1st c: *Dd*, 2nd c.: *xa.w*) and the nomen written in the third column.)

5. falcon with cobra, horizontal horns and šw crown

   Recorded on 3 fragments: P7188, P7198b, P7190d(?), ...

6. falcon with crown atef containing vertical horns and urei (topping the serekh)

   Recorded on 1 fragments: P7196g, ...

7. "serekh parade"

   Originally line of up to three figures topping the rectangle, holding hands.[72]

   Recorded on 4 fragments: P6815d (at least two figures, first person is holding was), P6818s(?), P6820jj (first person is holding was), P6822uu (only legs visible, above the serekh of Djedkare with up to 3(?) columns)

8. royal figure walking in front of the falcon on serekh topping

   Recorded on 3 fragments: P6081(?), P6831a (perhaps figure in between two falcons?), P6833s

9. "was-ankh-was" (niches-replacing rectangle with an ankh in between two was-spectres)

   Recorded on 8 fragments: P6782a (with hatched strip above the rectangle), P6786a (only was-ankh visible), P7190a, P7190d, P7190f, P7190m, P7191a, P7191k

10. peculiar figure in divided rectangle (as niches-replacement)

    Recorded on 1 fragment: P7190d (eventually considered to be a result of two mixed prints)

11. figure of "adorant" (in a niches-replacing rectangle)

    Recorded on 4 fragments: P7190d(?, together with was-ankh-was), P7190j, P7192a (together with was-ankh-was), P7192b

12. "lady in a shower stall" (figure in between the vertical objects in a niches-replacing rectangle)

    Recorded on 3 fragments: P6791, P7190b(?), P7190g

13. running king?

    Recorded on 1 fragment: P6833q (replacing niches in Wenis' serekh; figure with red crown)

[71] The rest of serekh design in P6831a is different than the piece which instantiates type 12 in publication (cf. Verner et al. 2006: 230, No. 91).

[72] According to the publication, the sequence of three figures could take place on the different seal design also in the intercolumnium (Verner et al. 2006: 234, No. 113).

14. “chancy bull”

    Running bull; behind him is a running king. Composition in rectangle in place of niches in serekh. Originally recorded merely as a phantom fragment; it eventually became core for another reconstructed seal. Nevertheless, caution is in place; according to the publication, the same motive is reported on the sealing ascribed to a different ruler (cf. Verner et al. 2006: 238, No. 127).

    Recorded on 1 fragment: P6816j, P6817o, P6817q, P6820ii

15. a man with a raised arm (striking captives or driving the bull)

    Recorded on 4 fragments: P6783a (in niche-replacing rectangle?), P6787a (in niche-replacing rectangle?, striking captives?), P6816k(?) (merely a fragment of a raised hand), P6822rr (possible connection to “chancy bull”)

16. niche segment – type with 8 vertical lines

    Recorded on 3 fragments (out of possibly more): P6784b (“serekh in akhet”?: half-arches on side(s) of the niches), P6819bb, P7200g et al.

17. niche segment – type with 7 vertical lines

    Recorded on 1 fragment: P6809a

18. niche segment – type with 6 vertical lines

    Recorded on 7 fragments (out of possibly more): P6828a, P6831c (Nyuserre), P7197h, P7199c, P7199h, P7999i, P7200f et al.

19. niche segment – type with 5 vertical lines

    Recorded on 6 fragments (out of possibly more): P6781a, P7191m, P7196l(?), P7198i, P7195e, P7194g(?) et. al.

20. falcon inside the serekh(?!)

    Recorded on 1 fragment: P7195a(?, cf. Verner et al. 2006: 264, No. 235)

21. “Sealing with an odd Horus name”[73]

    Recorded on 1 fragment: P6805e

b) symbols, emblemata and further signs

22. Bastet siting on the throne

    Recorded on 2 fragment: P7198c, P7197b (*bAst.t xnt*.[*t*])

23. Hathor sitting on the throne

[73] Multiple imprints of the serekh on the big cretulae P6805e opened the possibility of presence of the unattested or rare Horus name in the pyramid complex. The sealing is closely commented in the chapter on informal sealings and peculiar finds.

Figure with horns and solar disc, facing to the right.

Recorded on 1 fragment: P6832j

24. figure sitting on the throne

    Recorded on 7 fragments: P6786e (enthroned figure in the intercollumnium, facing to the right), P6792b(?) (enthroned figure in the intercollumnium, facing to the right), P7191h (enthroned figure in the intercollumnium, facing to the right), P7191m (highly schematic enthroned king in the intercollumnium, facing to the right, with flagellum and a spectre), P7192m (enthroned figure in the intercollumnium, facing to the right), P7193d(?) (fragment of the throne above the wab sign), P7198l (enthroned figure in the intercollumnium, turned to the right, with a spectre, without preserved head + *nb.t jmAw*?)

25. standing Ptah

    Recorded on 1 fragment: P7194b (highly schematic figure in the intercollumnium, facing to the right, with the wAs sceptre, caption *ptH*)

26. reclining ram

    Recorded on 1 fragment: P7196 (+ *xnt*(*.j*))

27. adoration of the king sitting on the throne

    Recorded on 1 fragment: P6810a

28. mnw? (depiction of a deity)

    Recorded on 2 fragments: P6817r, P6827 (two ithyphalyc gods, right one possibly holds a staff; cf. Nolan 2010: 163 ff. for possible reading *mnw jmn*(?); cf. Verner et al. 2006: 234, No. 113 for a closer analogy)

29. Re and Hathor

    Two bigger figures in top register of the seal. Sometimes solar discs visible. They both touch hands on the *wAs*-sceptre standing in between them.

    Recorded on 5 fragment: P7190i, P7196i, P7197a(?, inferred from tiny fragments and context), P7197g, P7198b

30. figure or two figures standing around the was sceptre (less defined potential variants of the Re and Hathor feature)

    Recorded on 1 fragment: 6786h, P7196c

31. two figures holding hands?

    Two figures on the rectangle. Left figure with short skirt, holding ankh. Second figure holding hand of the latter, possibly with the longer skirt. In the intercollumnium of serekh of king Djedkare.

    Recorded on 2 fragments: P7190l, P6821nn (possible miniature variant of the same motive?)

32. tiny man with a staff

    Recorded on 2 fragments: P6786b, P7195c

33. bigger figure with a staff (possibly sitting?)

    Recorded on 1 fragment: P6829d

34. standing figure above the sun disc

    Recorded on 1 fragment: P6817m

35. cartouche with double border

    Recorded on 10 fragments: P6783a, P6829a (*Wnjs*), P6829d(?) (above *Hw.t-Hr* and sitting figure with was), P6831a (part of the name *nswt bjtj*), P6832g (name *Jssj*), P6832h ([*Ra*]-ʿ*nfr*ʾ=*f*), P6833n (above *Hm-nTr*), P7196i, P7197f, P7198d

36. nbtj in the form of pair of figures/statues standing on baskets and holding staffs

    Recorded on 1 fragment: P6827 (only lower part of figures visible, cf. Verner et al. 2006: 234, No. 113 for a closer analogy)

37. incomprehensible fork (perhaps standard or barque with a bird?)

    Recorded on 1 fragment: P6828a

38. star in a half-circle??

    Recorded on 1 fragment: P6829e

39. independent cobra?

    Recorded on 1 fragment: P6801a(?)

40. fragment of a miniature standing figure

    Recorded on 1 fragment: P6820ff

41. possibly a pr sign with the combined red and white crown inside(?)

    Recorded on 1 fragment: P68199aa

42. uncertain depiction: possibly a figure siting behind the wAs-sceptre (perhaps in rectangle replacing the niches of the serekh?)

    Recorded on 1 fragments: P6820ee

43. bird on a standard

    Recorded on 1 fragment: P7194b

44. striding figure on top of small (Hw.t) rectangle

    Recorded on 1 fragments: P7194e

45. standing figure

    Recorded on 2 fragments: P6793 (figure holding something – a staff?), P6786c

46. vulture (mwt)

    Recorded on 1 fragment: P7190l(?)

47. feline

    Recorded on 3 fragments: P6810b (striding), P6812d (sitting), P7197f (upright)

48. feet on the basket

    Recorded on 1 fragment: P6818t

c) informal designs and oddities

49. reverse imprint of small tablets (possibly faience inlays?)

    Recorded on 1 fragment: P6815b

50. topsy-turvy motives

    Recorded on 2 fragments: P6814c, P6814d

51. imprint of the side of the cylinder seal

    Recorded on 1 fragment: P6826a (two imprints: on the centre and on side, outer d. 30 mm, inner d. 13 mm)

52. incised (hieratic)

    Recorded on 11 fragments: P6785, P6787c, P6805c2, P6808b, P6809b, P6812h, P6820gg, P6829i, P7192f, P7192g

53. incised (ornamental?)

    Recorded on 1 fragment: P6798

54. hybrids (incised sealing + sealing created by a cylinder seal)

    Recorded on 1 fragment: P6820gg is a unique piece so far, combining both an imprint of a cylinder seal and the hieratic inscription.

2.3 Typologically Important Pieces

Some cretulae were marked as “typologically important pieces” (TIPs). Basically, this was done for three reasons. 1) To select all whole pieces so as to create a reference set of pieces that can enlighten us regarding the shape and outlook of unfragmented cretulae. 2) To select a limited set of fragments that could illustrate the used typology and could be later used for help in the process of classification. Objects that were singled out could be used as paradigmatic examples of defined types regardless if they were preserved as whole cretulae. 3) To select problematic or puzzling pieces, or pieces that manifest new features, that need interpretation. Other pieces also, that may be useful for further study in order to advance the typology in the continuing research.

Form trichotomy is idealized; in reality some objects are singled out as TIPs for a mix of the above mentioned motives. Some may be the best available representative of newly suggested sub-types which require further investigation. Some of the “challenging” pieces were left without type ascription, while some were determined in respect of typology yet singled out as candidates that may undermine original definitions of types.

Whole pieces

P6783b: Wrinkled texture with textile structure; bigger oval shape (6-6,5 cm); couple of strings go through. Undulating reverse, likely of the bag sealing.

P6787c: A whole piece with the crossing of twines on the reverse.

P6790: A whole piece of undetermined type; pair of tiny parallel twines.

P6803d: A whole piece of bag sealing.

P6808a: A whole jar topper with the imprint of textile and preserved twines.

P6811: Trapezoid whole piece. Cut (twine?) runs along the long side. Reverse is not quite flat – it is slightly receding on flanks.

P6820ii: Whole lentiloid cretula of modest size (36x32x12 mm) and of an unknown type. Even flat reverse without visible structure. Imprint of twine continuing along the longer side, possibly encircling some object in the middle. The imprint in the middle of the reverse is puzzling due to combination of the element with a rectangular edge and curved imprints of the twine.

P6826a: A whole piece of a stopper (massive piece of clay situated over the mouth of the jar, supported by a ceramic ostracon worked out in a roughly trapezoid shape).

P6826b: A whole piece of a stopper (massive piece of clay situated over the mouth of the jar, supported by a ceramic ostracon worked out in a roughly hexagonal shape).

P6826c: Quite eroded piece of stopper, with parts extending inside the mouth of jar. Possible imprint of a peg-like support inside the jar. The surface is eroded in such a way that the potential use of covering textile cannot be excluded with certainty, though the direct contact with the jar seems to be more likely.

P6826d: Piece of stopper of the smaller size. Top part is damaged, yet the lower is preserved well. It presents an imprint of the rim and of the likely support.

P6827: A whole piece of a topper (indirect jar sealing situated in the mouth of the jar).

P6829i: A whole piece of uncertain type. The reverse shows traces of binding and partially also of textile. Some affinity to a bag sealing, though other options are conceivable as well. The obverse is incised with hieratic signs.

P7200g: A whole piece; possibly a bag sealing.

Paradigmatic pieces

P6791: big fragment of the *stopper* preserving inner relief of a jar as well as part of the cover.

P7192b: Fragment that proves the existence of type 2PS. It shows two imprints of pegs (diameters 9 and 11 mm) in roughly perpendicular position; some of the twines could be interpreted as securing both pegs. Cf. analogy in P7192e. Imprint of one of the pegs appears little uneven.

P7192e: Likewise P7192e, clear example of 2PS type with two perpendicular pegs (diameter 21 and 12 mm) touching.

P7200h: Indirect jar. The atypical piece, in which the binding twines are imprinted indirectly, possibly due to folding of a loose part of the covering textile also over the binding.

P7200i: indirect jar combining direct imprint of part of a jar, its textile cover, and a strip of textile used for a binding.

"Challenges"

P6786c: Uncertain kind of wrinkled texture (textile?), likely a bag, though the perpendicular direction of the twine on the side is surprising (could it eventually be a half of the stopper? If so, then pushed deeper into the rim of the jar – some twines on the good end rise upwards).

P6800a: Qualified for a box sealing type due to wooden flat reverse. Protrusion cuts into the clay with the netting-like surface structure.

P6803a: Possible candidate for a *two-pegs-and-string* (2PS) type. (Alternatively, topper's support in the mouth of the jar made of two parallel pegs.)

P6805e: Massive cretula (151 g) with inconsistent features. General shape of the upper part would hint a topper, but there is a roughly flat base or serif on one side of the hypothetical diameter. If the serif was oriented as a part of the base, the relation of such a base and the twines on the reverse would open the possibility of the peg-and-string type, but the reverse is too flat for such a type. We can imagine the cretula put in the corner of some structure, perhaps related to door jambs, yet it is not so simple. The serif is not at a right angle to the reverse; it was perhaps put on some more complex object. Given the excessive mass and dimensions of the cretula (91×65×27 mm), it is unlikely that it would be a fragment of an even bigger whole that could redefine its functionality. On the reverse, there are twines (at least four, possibly more), some in parallel, some diverging. Could any possible container be derived from the fragment of the possible title on the obverse ⌜*xtmw*⌝ *HA*.*t Htp*[.*w*]?

P6807a: Two flat surfaces on the reverse at a ca. 60° angle. One smoother, the other with a visible wooden texture. Twine on the broken edge runs across both surfaces. If the surfaces were created by a hexagonal peg, the type could be peg-and-string. Alternatively, could it be a non right-angled edge

of a box? (The fragment had been apparently broken and glued up, which makes an exact estimation of the relation of the former flat surfaces a bit difficult.)

P6808c: Sealing of an unknown type showing various features on the reverse.

P6810c: Lentiloid cretula with strictly flat base. Reverse shows crossing of twines, other twines revealed on the break. Perhaps a half of the whole piece? On one of sides there is a serif with the surface structure of thin parallel lines.

P6814c: Fragment with a convex wavy textile surface. The twine is on the break in a perpendicular position to the textile surface.

P6816i: Nearly whole object. Small conical piece of clay with broken tip. No imprint on the obverse. Flat reverse with complex fine imprints. Document sealing type has been considered, but the surface texture can not be verified as a papyrus imprint. Alternatively a gaming piece or a token?

P6817q: Big piece (78 g) of cretula with significant serif on side. Nearly parallel with the serif is an imprint of a wooden object with a crack. Three or more twines cross the possible direction of the wooden object.

P6817r: Rich, yet not clear reverse. There is a base, coiling, and imprint of wooden object(s), which direct the interpretation roughly to some kind of peg-and-string type. Yet the orientation of the bigger peg(s) is unexpected (possibly parallel to the base) and the other related object is uncertain (is it an independent smaller peg, fixed feature of the first peg or just imprint of an extraordinarily big charcoal?).

P6818u: Flat base, partially imprint of wooden surface. The wooden surface is generally very shallow, yet on one end it pushes a “rim” out of clay. Twines on a break; they run across the wooden surface in a distance (in perpendicular direction to the year rings of the wood). The wooden imprint, relative to the rest of the base, is far too shallow for a peg. The outline of the sealing hints that it could be a quarter of the whole piece, like in box sealings.

P6818w: Possibly a major part of the cretula. Lentiloid shape, reverse is generally flat with a textile texture. Twines are cut deeper into the break side, they run through the cretula, without the contact with the surface. Absence of the twines on the surface and rather flat surface questions otherwise preferred bag type classification. Curved outline of a part of the break side might suggests an implied peg, but this option is not supported by other clues and it is not conclusive.

P6819cc: Qualified for PS type, yet it leaves some features unexplained. Big cretula (75 g, 65x60x30 mm); even base with circular scratch(?) marks; imprint of the end of wooden peg (17 mm?, year-rings) with uncertain orientation. By its side, there is a small and even imprint (not certain if another peg or straightened cord, ca. 7 mm diameter) possibly touching the bigger peg in a perpendicular direction. Ambiguous relation of the bigger peg to twines.

P6820ee: Unknown type. Not quite straight reverse with one or rather two strips of binding. Perhaps so far unidentified kind of material? Small fragment of even base perpendicular to the reverse. Inconclusive feel of jar-type profile, but the base fragment would hardly fit into such an interpretation.

P6820gg: Qualifies for mPS type. Tipped for further study due to specific imprint on the reverse. Possibly somewhat rounded end of a peg (17 mm diameter) or half of the knob. Binding across the

object. PS classification uncertain as the peg imprint is discontinued by an obstructing clay, though secondary deformation of wet clay might be at fault.

P6821oo: This fragment presents some ambiguity of bag / possible indirect jar sealing types. The kind of folding of the textile much resembles IDJ type. If the fragment is oriented “horizontally”, the incurvation of the reverse seems to be quite contrary to the imprint of the jar, leaving the bag imprint as possibly a more meaningful resort. If one considers turning the orientation of the fragment “vertically”, it might fit better to the IDJ pattern and the short side that should comply with the possible curve of the jar’s perimeter would be short enough (24 mm) to be inconclusive.

P6823xx: Unknown type. Imprint of wood on part of the reverse side. General shape of the reverse is nearly flat, yet unevenly. The interpretation of the part with the wooden imprint is inconclusive. It could be the imprint of a peg of 11 mm diameter, but such a peg imprint would be far more shallow than any observed so far. Small base on side, flat with likely wooden structure.

P6828a: Lentiloid fragment with tiny perpendicular twine-cuts on the reverse. Uncertain whether the reverse is specific for some particular type or not.

P6832h: Unknown type. Possibly axial feature of the reverse (or more complex saddle-like), on side two parallel imprints (or likely imprint of a cracked peg) in perpendicular direction to the former axis.

P6833p: Currently classified as indirect jar sealing. Object marked for further study because the possibility of a so-far unidentified type cannot be excluded. Slightly folded flat-like imprint of textile on reverse. Deeper imprinted binding (without torsion) and another binding passing through the clay (with organic remains). Third binding imprinted on the obverse.

P7190b: Small fragment with an uneven base shows interesting turn of binding around two edges of the cretulae’s base.

P7190m: Fragment of sealing with unusual imprint of possible peg with grooves. Cf. also P7197h and perhaps P7197i and P7198i.

P7193a: Identified as PS type, yet the “profile” features of other part of the reverse leave open the possibility of some more complex imprint, or even the possibility of reinterpretation along the direct jar type(?).

P7196i: Half of a smaller cretula (high lentil) with raised cavity in the centre of the reverse (crossing of twines or a small knob?).

P7197h: Fragment with imprint of possible peg or binding with grooves. Cf. also P7190m and perhaps P7197i and P7198i.

P7198g: Flat piece with imprint of several twines, some of them making the circle as if they were part of some wicker lid while some seem to make parallel lines. No imprints that could be ascribed to a rim.

P7198h: Cretula of general shape of the sealing in the mouth of the jar. On the reverse, there are plenty of traces of binding (perhaps organic, perhaps twines, definitely none twisted) which cover great part of the surface. The overall affinity to indirect jar sealing is undermined by inconclusive traces of textile on the reverse.

P7199c: Nearly entire piece. Ascribed to mPS type, if we accept that the peg could lie almost entirely out of the cretula and imprints merely the side of the cretula. The reverse surface is inconclusive: beside the binding, there are some possible marks of textile, but not on the whole base.

P7199g: A half or more of the cretula with a significant axial relief roughly parallel to the base. Wooden structures on the base. At least part of the binding does not seem to interact with the potential axis which undermines the PS ascription.

3. Results of documentation

The original intention of the work has been to compare evidence of activity of particular actors (on the sealing obverses) with evidence of kinds of containers imprinted on the sealings' reverses and thus try to mark out the boundary of authority of the active officials. The actual implementation of such plan is more complicated and must respect the archaeological conditions of the finds, yet it inspires the structure of the presentation of the results of the documentation. The results would be presented from three perspectives: distribution of cretulae with regard to their types in chapter 3.2, distribution in regard of attested titles and institutions in chapter 3.3, and detailed presentation of spatial distribution in chapter 3.6.

The study of sealings from the Pottery Mound conducted by John Nolan (Nolan 2010) had a great impact on the presented work, particularly his analytical approach to the typology (discussed above) and the focus on the reconstruction of theoretical seals. The attempt to reconstruct several seals whose sealings were repeatedly attested is described in chapter 3.4. Chapter 3.5 then explains the potential effect of such a reconstruction on the discussed analysis in the future.

The presentation begins with basic information on the numerical distribution of cretulae in the Raneferef pyramid temple in chapter 3.1. Representativeness of studied sets of cretulae in respect both to the entire corpus and to activity in areas where they were found would be sketched.

3.1 Distribution of cretulae in the Pyramid complex of Raneferef

Below is the table providing total numbers of cretulae from the Náprstek Museum with respect to various parts of the Raneferef pyramid complex. The work divides parts of the complex according to the structure of presentation of its parts in the excavation monograph (Verner et al. 2006). The degree of representation states the proportion of the cretulae from the Náprstek Museum to all cretulae registered in given area with the average degree of representation being about 31%. See chapter 3.6 for more detailed information on sets of sealings from the Náprstek Museum with regard to particular areas of the temple.

Area	**Number of cretulae**	**Degree of representation**
Early Temple – Entrance Area	5	31%
Early Temple – Central Sector	36	32%
Early Temple – Southern Sector	12	5%
Early Temple – Northern Sector	116	44%
Expanded Temple – Open Columned Courtyard + North and South Row of Houses	7	ca. 50%
Expanded Temple – Entrance	23	62%
Surroundings of the temple (incl. former rooms AC)	30 (all specifically from the AC area)	25% (resp. 37% for the AC area)
House of the Knife	85	42%

Not only does the number of finds vary on a room-to-room basis, but the degree of representation varies on a room-to-room basis as well. The figures presented in the table are averages, yet finds from some rooms might be even exclusive to either the Egyptian Museum in Cairo or to the Náprstek Museum.

There are rooms in the temple where either none or individual cretulae were registered, while on the other hand very large sets were found in a couple of rooms. As we are further focusing on the corpus kept in the Náprstek Museum, the individual places with sets of more than 20 cretulae include storage rooms CR and CS from the Northern Section of the Early Temple (55 and 29 cretulae), storage rooms XJ and area AI[74] from the former House of the Knife (44 and 38 cretulae), and the AC

[74] The presented study follows the excavation documentation while using designation area/room AI. In the publication (Verner et al. 2006) the area seems to correspond to room XG on the plan of the pyramid complex, yet the distinction AI/XG is kept in the publication as well in the presentation of sealings (cf. Verner et al. 2006: 237, Nos. 125 ff. vs. 263, Nos. 231 ff.).

area which is a complex mix of several former store rooms and a refuse deposit build over them along the later side exit from the temple with 30 cretulae in the corpus in the Náprstek Museum.

Most cretulae were found on the floor levels, resp. in closest layers above the floor level; this makes their find contexts *potentially* (N.B.) identical or close to areas of their function, i.e. places where they were broken or, with some of them, applied on doors and containers. Before we are able to discern (probably within the peg and string subtypes) door sealings from others, it is too early to try to confidently distinguish locally used seals from those whose imprints were imported to the complex on sealed containers.

In addition to that, there are also sets that were collected from refuses and layers of drifted sands and where the relation to the area of function cannot be established (or obliquely, if the prevailing relation of particular refuse to particular area of the temple could be established). There are also rooms in which the reported find context has to be evaluated with respect to evidence of the disintegration of the originally two-store units (the storage rooms in the north sector[75] and in one of the priest houses in the former columned open courtyard[76] particularly[77]). Finally, some cretulae were found even under the floor levels[78] or in the layers between the different floors established along with additional modifications of the temple.[79] Brief information about the find contexts of particular sets of fragments can be found in the tables in chapter 3.6.

3.2 Distribution of cretulae types

Altogether, 314 cretulae and their fragments were studied. For 148 pieces (47%), some typological classification was proposed.

For 8 fragments, variant classification was recorded:

variation	number	variant 1	variant 2
between types	4	bag	IDJ
	1	bag	stopper
	1	mPS	box
within one type	1	2PS	PS
	1	m2PS	mPS

[75] Cf. Verner et al. 2006: 59 ff.

[76] Abusir papyri (fr. 4 A and fr. 45-46 Ac) mention a door under the stairs to the rooftop in the room of the *Hm-nTr* priest and the routine check of the seal of this room. Cf. Posener-Kriéger, Verner and Vymazalová 2006: 339 f.) For archaeological evidence of the stairs in the room P in the Northern Row of Houses, cf. Verner et al. 2006: 73 f.

[77] There is evidence of stairs also in the House of the Knife, but it seems that they were already dismantled at the time of the incorporation of the House into the Extended temple. Cf. Verner et al. 2006: 93 ff.

[78] E.g. set of 19 cretulae from the CS storage room in the artificial hole (P6831a-f, P6832g-m, P6833n-s).

[79] Set of 19 cretulae from the layer in between two floors in the room CAa (P7199a-l, P7200a1-i).

The overall typological distribution of classified fragments is as follows:

broad type	number	% out of classified[80]	% out of all[81]	specific type	number	% out of broad type
peg-and-string	95	64	30	2PS	3	3
				PS	30	32
				mPS	37	39
				iPS	20	21
				m2PS/mPS	1	1
				m2PS	2	2
				2PS/PS	1	1
				mPS/box	1	1
bag	23	16	7	bag	6	25
				mbag	12	50
				mbag/IDJ	4	17
				mbag/stopper	1	4
document	1	< 1	<<1	document	1	100
"box"[82]	7	5	2	box	6	86
				mPS/box	1	14
jars	28	19	9	direct jar	5	18
				indirect jar	6	21
				stopper	7	25
				topper	2	7
				mbag/stopper	1	4
				mIDJ	3	11

[80] The 100% is 148 classified fragments. The values were rounded to whole numbers.

[81] The 100% is 314 studied fragments. The values were rounded to whole numbers.

[82] This does not represent the whole category of boxes, but only the particular sub-type of sealings that reveal a flat reverse with an imprint of a smooth wooden surface. The other likely boxes are undistinguished in the peg-and-sealing type so far.

				mbag/IDJ	4	14

In the following subsections, spatial distribution of types of sealings will be showed.

a) bag sealings and possible bag sealings

Area	**Number of candidates**	**Distribution of candidates**	**Number of confident finds**	**Distribution of confident finds**
Early Temple – Entrance Area	-		-	
Early Temple – Central Sector	9	CAa (5), CB (1), CF (2), CN (1)	2	CF (1), CN (1)
Early Temple – Southern Sector	-		-	
Early Temple – Northern Sector	9	CP (1), CR (5), CY (1), CZ (2)	4	CR (2), CZ (2)
Expanded Temple – Open Columned Courtyard + North and South Row of Houses	-		-	
Expanded Temple – Entrance	3	A (2), E (1)	-	
Surroundings of the temple (incl. former rooms AC)	1	AC (1)	-	
House of the Knife	1	XJ (1)	-	

Potential bag sealings are centred around the storage rooms of the Northern sector and the Central sector of the Early temple. Concentration of potential bag sealings in the room CAa is related with the theoretical "Seal of the sealer of finest offerings", respectively with the titles *pr-HD n Xnw* (this title is attested on possible bag sealings only, but in total of mere two fragments) and *jm.j-x.t pr-HD.* In CAa room, thery represent 3–5 fragments out 9 identified (or 19 total), in storage room CR up to 5 fragments out 21 identified (or 54 total).

b) jar sealings (DJ, IDJ, toppers and lids)

Area	**Number of candidates**	**Distribution of candidates**	**Number of confident finds**	**Distribution of confident finds**
Early Temple – Entrance Area	4	CT (4)	4	CT (4 stoppers)
Early Temple – Central Sector	11	DH (2), CAa (4), CE (2), CF (2)		DH (2 DJ), CAa (2 IDJ), CE (2 DJ), CE

				(2 DJ)
Early Temple – Southern Sector	-			
Early Temple – Northern Sector	8	CP (1), CR (3), CS (1), CV (2), CZ (1)	5	CP (1 topper), CR (1 IDJ), CS (1 IDJ), CV (1 IDJ), CZ (1 topper)
Expanded Temple – Open Collumned Courtyard + North and South Row of Houses	-			
Expanded Temple – Entrance	1	A (1)		
Surroundings of the temple (incl. former rooms AC)	1	AC (1)	1	AC (1 stopper)
House of the Knife	2	XJ (2)	1	XJ (IDJ)

All five sealings that are confidently of *direct jar* type were found in three rooms of the central part of the Early temple: in the rooms DH, CE and CF.

The six sealings that were confidently of indirect jar type, were found in storage rooms of the Northern part of the Early temple (CV, CR, CS), in the Central section of the Early Temple (CAa) and in the storage room of the former House of the Knife (XJ). None were found in significant concentrations. If we count in also the uncertain candidates for indirect jar type, the picture differs only slightly. Another one or two fragments are found in respective rooms plus one uncertain indirect jar (or bag) sealing appears also in the Entrance of the Expanded temple (A).

The small concentration of stoppers in room CT consist of stoppers of several kinds.

c) peg-and-string (PS, mPS, iPS, 2PS, m2PS, 2PS/PS, mPS/m2PS, mPS/box)

Area	**Number of candidates**	**Distribution of candidates**	**Number of confident finds**	**Distribution of confident finds**
Early Temple – Entrance Area	-		-	
Early Temple – Central Sector	5	CAa (2), CF (2), CN (1)	3	CF (2 2PS), CN (1 PS)
Early Temple – Southern Sector	5	DK (3), DY (2)	5	DK (3 PS), DY (2 PS)
Early Temple – Northern Sector	29	CO (2), CP (2), CR (14), CS (6),	6	CR (5 PS, 1 PS/2PS)

		CY (1), CZ (4)		
Expanded Temple – Open Collumned Courtyard + North and South Row of Houses	1	Z (1)	-	
Expanded Temple – Entrance	6	A (3), E (3)	-	
Surroundings of the temple (incl. former rooms AC)	3	AC (3)	3	AC (3 PS)
House of the Knife	45	XJ (20), AI (25)	17	XJ (5 PS), AI (11 PS, 1 2PS)

Peg and string type was definitely most frequently represented (or identified) type. With certainty, it would be divided to more subtypes, as several kinds of imprints of pegs were observed. Some sealings prove the existence of subtype which use the mechanism based on two different pegs. As for the feared ambiguity of imprint of pegs and imprints of rims of jars, the peg interpretation seems to be more likely. (In reflection, even some imprints that are not straight or are slightly bend could be imprints of pegs.)

During the studies both in Náprstek Museum and in Egyptian Museum, the existence of sealings securing two pegs bound together by a twine was proved.

All the sealings from the Southern area of the Early Temple, to which a type was ascribed were confidently classified as peg-and-string type (5 fragments out of 11 finds).

d) "boxes"

It was not a primary intention to outline box sealing type as separate category, due to assumption, that boxes were largely closed by peg and string mechanics and we should seek them as a sub-type of peg-and-string sealings. Though not all of box sealings had to be of the peg-and-string type.

Perhaps also not all PS-based box sealings must have PS features visible. The piece P6818u was commented in TIP section with a suggestion that box sealing could be an option in further consideration of the typology, yet it was rather marked as unknown in catalogue. The fragment has likenes of a fragment of a PS box sealing, of the kind that often breaks up to four quarter.

Study of sealings in the Náprstek museum distinguished sub-group of sealings that showed flat even surface with obvious marks of wooden year-rings. That alone qualifies them for a *box sealing* type in current typologies.

Six fragments with flat wooden surface were found in the entrance area of the Expanded temple, in corridor A (1) and in the refuse layer in the room E (5). One further fragment which shows both wooden flat surface and peg-and-string was found in storage room CO in the Northern section of the Early temple.

e) document sealings

Only one sealing from the room Z in the southern row of houses in the "City of Priests" was identified as a *document* sealing.

In fact the marks of papyrus on the reverse are very subtle and could not be identified with confidence if the fragment is not preserved well. In the future it would be needed to work out auxiliary clues that might help to identify this type.

Cf. above in chapter 1.4.2.2 for the suggestion, that stored documents were kept in boxes.

3.3 Distribution of authorities

Full conclusion of detailed analysis of all concurrencies of epigraphical features of individual fragments unfortunately exceeded scope of this work. At this stage of research, the presentation limits itself to mere list of spatial distribution of recurrent elements.

a) Titles

Hm-nTr

Most frequent title, (resp. element of title), whose prominence is hinted also by Abusir papyri (for this and several other titles, see Posener-Kriéger, Verner and Vymazalová 2006: 370 ff.)

Recorded at least on 36 fragments. It is also present at least on two out of five theoretical seals (Seal No. 245 and "Seal of the serekh parade").

Area	Room	reg. no.	type	details
Early Temple – Entrance Area	CT	P6826a	stopper	
		P6826b	stopper	
Early Temple – Central Sector	CAa	P7199a(?)		+ *Hw.t-Hr*?
Early Temple – Northern Sector	CP	P6808d	mPS	
	CQ	P6828a(?)		*Hm*(?)-*nTr nTrj-bA.w Ra-nfr=f*
	CR	P6818s	iPS	+ *Ra-nfr=f?*
		P6819bb	mbag	+ cartouche
		P6820ff		+ O 24 above

		P6822tt	bag	
		P6822uu		
		P6823xb	PS	
	CS	P6829f	iPS	
		P6831c		+ *Ra-nfr=f*?
		P6831d		
		P6833n		
	CZ	P6827(?)	topper	
Expanded Temple – Entrance	A	P6781a		
		P6783a(?)	iPS	
AC area	AC	P6791(?)	stopper	
House of the Knife	AI	P7190b(?)		
		P7190e(?)		
		P7190h	PS	
		P7191m		
		P7192c	iPS	+ O 25
	XJ	P7195c		*Hm-nTr Ra-nfr=f*
		P7195e(?)		
		P7196b		+ O 24 / *Hm-nTr Ra-nfr=f*
		P7196c(?)		perhaps *Hm-nTr* ra *Hw.t-Hr m st-jb ra*?
		P7196e	mPS	[*Hm*]*-nTr nTrj-bA.w Ra-nfr=f*
		P7196h		+ O 24
		P7196j		
		P7197g		*Hm-nTr Ra-nfr=f?*

		P7197h	iPS	+ O 24
		P7197m(?)	mbag	+ O 24
		P7198j		+ O 24

Hr.j-sštA

Title *Hr.j-sštA* “one who is privy to the secret” or “secretary” is the second most frequent in the studied corpus. It was recorded on 24 sealings. It is also present on three out of five theoretical seals (Seal No. 154 and Seal No. 245 and possibly on the “Seal of the serekh parade”).

Area	**Room**	**reg. no.**	**type**	**details**
Early Temple – Central Sec.	CF	P6803d	bag	
	CT	P6826a	stopper	
Early Temple – Southern Sec.	DY	P7193b		[H]rj-ˁsˀštA
	DK	P7194a		(not collated), No. 166
		P7194c(?)		[...]štA
Early Temple – Northern Sec.	CO	P6807a	mPS/mbox	
	CP	P6808a	topper	Hr.j-ˁsˀš[tA]
		P6808d(?)	mPS	[Hr.j-sš]tA pr[...]
		P6808e	iPS	
	CR	P6818s(?)	iPS	No. 26, Hr.j-s[štA]
Expanded Temple - Entrance	A	P6783b	mbag	
	E	P6800a	“box”	No. 13
AC area	AC	P6791	stopper	
House of the Knife	AI	P7190a	mPS	No. 150
		P7190g(?)		No. 152, Hr.j-s[štA], [...]tA

		P7190j		Hr.j-sš[tA]
		P7191b	PS	No. 154
		P7192k(?)		Hr.j[...]
	XJ	P7196a(?)		[...]-˹s˺štA
		P7197g		No. 245
		P7197h	iPS	No. 246[83]
		P7197k(?)		*Hr* + *r* + *š*
		P7198j		
		P7198k	PS	No. 248

xnt.j-š

Either part of a title (often xntj-š "tenant" or "attendant") or various divine epithets ([XY] xntj-NN, "[XY,] one who is foremost of the NN"). Four occurrences of *xnt(.j)*-element that were obviously parts of the god's, resp. king's epithets (beloved of Khnum(?), Bastet and Khentytjenenet), all from the storage room XJ from the House of the Knife were excluded from the list (they could be searched above in the list of recorded elements in chapter 2.2).

Recorded on 7 sealings

Area	**Room**	**reg. no.**	**type**	**details**
Early Temple – Central Sector	CF	P6803a(?)	2PS	*xnt.j*[...]
Early Temple – Northern Sector	CR	P6817l		[...*xt*] *xnt*[...]
	CZ	P6812b	bag	
Expanded Temple – "City of Priests"	F	P6784a		*jm.j*-[*ra*?]- *xnt.j*[...]
	Z	P6796a	document	*xnt.j-š*
		P6796b		[...]*xnt*[...]
Expanded Temple – Entrance	A	P6787b		*xnt.j-˹š˺*

[83] Two more fragmentary rolls of lower register of the cylinder seal observed.

xtm(w)

Core element of the title of the holder of the seal and of derived titles.

Recorded on 8 fragments. (Six more fragment contains the string Htp.wt, which is connected at least in several cases, cf. *xtm*(*w*) *HAt Htp.wt* on the "Seal of the sealer of the finest offerings".) Attested on two so far identified theoretical seals: "Seal of the Sealer of finest offerings" and "Seal of the serekh parade".

Area	Room	reg. no.	type	details	ruler	concurrency
Early Temple – Central Sector	CAa	P7199b	mbag/mIDJ	*xtm*(*w*) *HAt Htp.wt*		
	CN	P6814b(?)	bag			
Early Temple – Northern Sector	CR	P6818s	iPS	*xtm*(*w*)-*nTr*?		
		P6822vv	PS	*zš n xtm*[...] *nTr*?		
Expanded Temple – "City of Priests"	F	P6784a		jr.j-xtm.t		
	S	P6797(?)		*xtm(w)* or *anx*?		
	Z	P6796b(?)				
House of the Knife	XJ	P7195a	IDJ	*xtm.w DfA.w*		

sHD

Title "inspector" and element of derived titles.

Recorded on 4 fragments

Area	Room	reg. no.	type	details
Early Temple – Entrance	BD	P6825		possibly ⸢*s*⸣*HD* + either wsxt or zš
Early Temple –	CP	P6808d(?)	mPS	

Northern Sector				
	CR	P6817r		*sHD zš*
	CV	P6810d	mIDJ	+ O 24

wab

Element of the titles related to wab-priests or institution of *wabet*..

Recorded on 16 fragments. Potential presence of the element on the theoretical Seal No. 245 is under consideation.

Area	**Room**	**reg. no.**	**type**	**details**
Early Temple – Entrance	BD	P6825		+ O 24?
Early Temple – Northern Sector	CQ	P6828a		No. 41: ⌜*wab (n) nTrj-bAw-Ra-nfr=f*⌝),
	CR	P6820gg	mPS	(fragmentary)
	CS	P6829f	iPS	
		P6831a	mPS	
		P6832k(?)		
	CV	P6810b		
		P6810d(?)	mIDJ	*sHD wab + [...]sw.t??*[84]
	CZ	P6827	topper	
Early Temple –	DY	P7193d		

[84] P6810d from the lowest layer of the storage room CV gives a sequence of ambiguous signs which could form the element *swt* followed by possible classifier of the pyramid O 24. This is immediately followed by the sign *s* and a vertical sign that could be *HD* (thus making *sHD* element). (Reading *sHD* is reinforced by a different fragment of imprint which contains precisely the *sHD* element.) The last visible fragment of the intercollumnium belongs to *wab*. The whole sequence is preceded by a vertical sign with a base (like a D 58) whose meaning is not yet clear. Indeed, *swt* elements form part of the name of several Old Kingdom pyramids (alternatively, in some titles *swt=f* or *swt=s* refers to cult places of various gods, goddesses or royal institutions). Only small fragment of serekh is visible, but the presence of the *-xa-* element in the upper right corner is likely, limiting the dating to a period between Neferirkare and Djedkare and thus the eventual pyramid complex in question to one of Menkauhor or earlier (namely of Nyuserre or Weserkaf).

Southern Sector				
House of the Knife	AI	P7192h	PS	
	XJ	P7195e		*wab nswt*?
		P7197k(?)		
		P7197l		
		P7198d(?)	iPS	
		P7198e		

zA

Element pertaining to phylai and related titles.

Recorded on 2 fragments.

Area	**Room**	**reg. no.**	**type**	**details**
Early Temple – Northern Sector	CS	P6830		
Expanded Temple – Entrance	A	P6783c		together with possible wAD.t sign and a bird

zAb

A judge, resp. element of judiciary titles.

Recorded on 9 fragments.

Area	**Room**	**reg. no.**	**type**	**details**
Early Temple – Central Sector	CAa	P7199f		⸢*zAb aD-mr*⸣ *n* [...]
		P7200d(?)		*zAb aD-mr n* [...]

Early Temple – Southern Sector	DK	P7194a(?)		(not collated)
Early Temple – Northern Sector	CR	P6817r		
		P6822ss		
		P6822tt	bag	
House of the Knife	AI	P7190k	PS	
	XJ	P7195b(?)		
		P7196m(?)	PS	

zš

Core element of the title "scribe", resp. of derived titles.

Recorded on 13 fragments.

Area	**Room**	**reg. no.**	**type**	**details**
Early Temple – Entrance	BD	P6825(?)		possibly ⌜*s*⌝*HD* + either *wsxt* or *zš*
Early Temple – Northern Sector	CO	P6807a	mPS/box	
	CQ	P6828a		
	CR	P6817r		*sHD zš*[85]
		P6822ss		
		P6822tt	bag	
		P6822vv	PS	*zš n xtm*[*t*] *nTr*?
	CV	P6810a	IDJ	*zš nswt*
House of the Knife	AI	P7190k	PS	
		P7192i	mPS	

[85] Possibly *sHD zš* related also to *Hwt-wrt* (written with snake frieze over the rectangle). Cf. Verner et al., 2006, No. 25. (*Wsr* sign corrected to *HD* as a result of collation.)

	XJ	P7195f	mPS	perhaps *zš pr HD*
		P7197j	PS	
		P7197m(?)	mbag	+ *mAa.t*

b) Institutions mentioned in titles

Cf. Verner2014: 99 ff. and Posener-Kriéger, Verner and Vymazalová 2006: 336 ff. for the description of involvement of various institutions in the operation of the royal mortuary cult according to Abusir papyri.

pr-aA

Element referring to the institution of the king's office.

Recorded on 19 fragments, prominently attested from the storage houses in the Northern sector and the House of the Knife. The *pr-aA* is attested also on the reconstructed "Seal of Chancy Bull".

Area	**Room**	**reg. no.**	**type**	**details**
Early Temple – Southern Sector	DK	P7194g		
Early Temple – Northern Sector	CQ	P6828a		+ *zš*
	CR	P7188		
		P6817o		
		P6819aa		broad *pr*
		P6819cc	PS	⌜*pr*⌝*-aA*
		P6820ee		broad *pr*
		P6820gg,	mPS	
		P6820ii		broad *pr*
		P6821kk		broad *pr*
		P6821ll,	PS	
		P6821mm(?)		
	CS	P6832l	iPS	
	CV	P6810b		

	CZ	P6827	topper	
House of the Knife	XJ	P7197c	iPS	
		P7197h	iPS	
		P7198j		
		P7198k	mPS	

pr-HD

Institution of the treasury.

Recorded on 9 sealings. Cf above about the striking prominence of possible bag sealings impressed by seals bearing this element. Attested on the reconstructed "Seal of the Sealer of finest offerings".

Area	**Room**	**reg. no.**	**type**	**details**
Early Temple – Central Sector	CAa	P7199b(?)	mbag/mIDJ	
		P7199e	mbag/mIDJ	*jm.j-x.t-pr-ꜥHDꜣ*
		P7199h(?)	mbag	*ꜥjm.j-x.t prꜣ*-[...]
		P7199i(?)		*ꜥjm.j-x.t pr-HDꜣ*
		P7200a1		[*jm.j*]*-x.t pr-HD*
		P7200b		[*jm.j*]-ꜥ*x.t pr-HDꜣ*
	CF	P6803d	bag	*pr HD n Xnw*
	CN	P6814b	bag	*pr HD n Xnw*
House of the Knife	XJ	P7195f	mPS	perhaps *zš pr-HD*

Xnw

The royal residence (cf. Verner 2014: 99 ff. and Posener-Kriéger, Verner and Vymazalová 2006: 354 ff.).

So far attested exclusively on the bag sealings.

Area	Room	reg. no.	type	details
Early Temple – Central Sector	CF	P6803d	bag	part of *pr-HD n Xnw*
	CN	P6814b	bag	part of *pr-HD n Xnw*

st-jb-ra

Element of the name of the sun temple of Neferirkare (st-jb-ra) (cf. Verner 2014: 209 and Posener-Kriéger, Verner and Vymazalová 2006: 351 f.)

Recorded on 14 fragments, including the replicates of the Seal No.. 245.

Area	Room	reg. no.	type	details
Early Temple – Entrance Area	CT	P6826a	stopper	[...] m st-jb-ra + O 25
		P6826b(?)	stopper	⌜*st*⌝-[*jb*]-⌜*ra*⌝ + O 25
Early Temple – Southern Sector	DY	P7193d(?)		
Early Temple – Northern Sector	CP	P6808d	mPS	
	CR	P6818x	mIDJ	
	CS	P6829h(?)		O 25 only
House of the Knife	AI	P7191h(?)		
		P7192c	iPS	
	XJ	P7196c		
		P7197a	m2PS/mPS	
		P7197g		
		P7197j	PS	

		P7198g		*m st-jb-ra* + O 25

3.4 Reconstruction of theoretical seals

Reconstruction is based upon the assumption that common features of fragments that are joined together are reasonably exceptional (within the given corpus) to conclude that the features are likely to have been produced by single seal (while some markers could be truly unique, in reality a sufficient degree of exceptionality is usually based on the concurrence of several followed markers.) The particular assumptions must be documented in order to allow for the control or possible revision of the reconstruction. In literature, sealings which were created by the same seal are termed "replicates" (Nolan 2010: 21) and their identification is an important step in processing large sealing corpuses. Miroslav Verner already suggested that some sealings published in the excavation monograph (Verner et al. 2006: 209–270, Nos. 1, 13, 15, 16, 26, 55, 76, 82, 92, 120, 151, 158, 187, 192, 199, 204, 215, 236, 243) have one or more replicates.

The reconstruction of theoretical seals is allowed by several presuppositions already stated and discussed by John Nolan:

- Seal designs belongs to individual officers, not to their institutions or branches. The fact that official seals often mention several titles is interpreted as a sort of "fingerprint" of individual holders of *official seals* (N.B.).
- The cretulae are not marked by several seals; no countersealing is presumed in this period of the Old Kingdom (see Nolan 2010: 133 for a discussion of the possibility of countersealing in this period. An interesting detail for our study is that the discussion also deals with possible counterexamples that come from the Abusir corpus of the pyramid complex of Queen Khentkaus II).
- For the sake of reconstruction, we rely on the fact that the official seals adhere to a high degree of regularity in their design (alternating columns and serekhs, possibly a few lines in lower register). We would see that this is still true in the general sense, yet in several details, the seal patterns of the Fifth Dynasty do not fear to evolve (and jazz up) its form.

To grasp a specific situation of Nolan's corpus, we should be aware that the Pottery Mound corpus is the subject of a unique level of occurrence of replicates. Of the 12 most frequently used seals or "core seals", the most active seal is attested on 91 sealings, while the next eleven on 67, 56, 41, 32, 31, 22, 22, 21, 16, 16 and 9 sealings.

Generally speaking, in a reconstruction of theoretical seals, the best results could be achieved if one may combine advantages of two kind of sealings: those which contain bigger fragment of seal design[86], and those which replicate the elements of the recurring design. Replicate sealings are, moreover, important to hint sustained sealing activity.

[86] For this reason, a number of preserved columns were noted in working notes sometimes as an indicator of which sealings might be more suitable to start with for the reconstruction. It is actually a bit of a simplifying characterization, because some bigger sealings retain sizeable fragments of bottom lines instead. In any case, the so-far conducted reconstructions of theoretical seals were triggered by a recurrent presence of peculiar iconographical features instead.

Below is list of seals whose activity was attested in several fragments and whose partial reconstruction could have started. At the moment, seals with only two replicates are not added to the list. This is the case of P7200i and P7200j, which repeat an almost identical part of the seal. In this case, identity of the type and the use of yellowish clay brought up the possibility that both fragments originated in one original cretula. Details on the reverse of fragments suggest otherwise. The cretulae were used either on different jars of a similar kind, or on the same jar closed on different occasions. In one case, a strip of fine textile is also used for the binding of the cloth cover of the jar (P7200i), while in the other case the textile which covered the mouth and the neck of the jar happens to be folded over the binding, which is then imprinted indirectly.

Seal of No. 154 / "w-a-w" Seal

This seal was reconstructed thanks to the recurrence of the iconographic feature "was-ankh-was", placed in the rectangle replacing the niches of the serekh,[87] often together with set of strings *jr.j-mDA.t*, *Xrj-a*, *Hr.j-sštA* the depiction of the writing case as a classifier. The alternating motive for "was-ankh-was" in the lower rectangle of serekh was the "adorant" (Plate X).[88]

The replicated use of the seal was already marked in the publication (Verner et al. 2006.: 243) on the seals Nos. 151 (P7190d), 153 (P7190m) and 154 (P7191b).

So far about 5 columns are reconstructed, mostly upper and middle register. The line(s) in the lower register are still not attested or associated.

The seal holds the Horus name of Djedkare. The official held the titles *Hr.j-sštA*, *jr.j-mDA.t nswt*, *ny Xrt-a*.

Altogether, 14 replicates have been identified so far. The seal is ascribed to sealings P7190a, P7190d, P7190f, P7190m, P7191a, P7191b, P7191c, P7191f, P7191g, P7191k, P7191l, P7192a, P7192b, P7192e.

All replicates belong to museum registration numbers P7190-7192 (excavation reg. no. 982/I/1984) and were found in the "House of the Knife" in the room AI[89] in the layer above the ground, in the westernmost part of the room AI, under the mud "bench" attached to the western wall of AI. It is interesting that no replicate of this seal has been found elsewhere in the pyramid complex so far. The future study of sealings from the Egyptian Museum in Cairo will concentrate on testing this unexpected result.

Out of 14 cretulae fragments, 8 (57%) are candidates for some kind of the peg-and-string sealing type (2 PS, 2 2PS, 2 mPS, 2 iPS). The remaining 6 sealings were left unclassified.[90] What kind of

[87] Such an iconographic feature was not entirely unique; its variant (with different details and somewhat different style of drawing) was found on a single sealing P6782a from the room (resp. corridor) A.

[88] As attested on P7192a. The motive of "peculiar figure in the divided rectangle" on P7190d is best explained by accidental mix of two imprints of "adorant" in perpendicular orientation.

[89] Cf note 74 above.

[90] Fragments of cretulae without an assigned type are, on average, of smaller mass, so they are more fragmentary. While the classified cretulae are of average mass 22 g (interval 9–54 g), those without assigned type have an average mass of 7 g (interval 3–12 g). Still, this does *not* imply that all respective cretulae without an assigned type are merely potential peg-and-strings too fragmentary for a successful assessment!

object they sealed by means of the peg-and-string mechanism is currently not certain; Miroslav Verner suggested that P7190a might be a box sealing (Verner et al. 2006: 242, No. 150).

Seal of "chancy bull"

The seal was reconstructed on the basis of the repeating presence of the iconographical motive of the running bull in the rectangle replacing the niches in the lower part of the serekh. Eventually a running (chasing) royal figure emerged behind the bull in the rectangle. Other concurrent motive is a sign just left to the rectangle: perhaps of a mace with strips (similar to T 4, though the strips are going upwards) whose reading is not clear(Plate XI). The alternating iconographical motive in the lower part of serekh is a striking man (man striking the captive perhaps; the left part is attested merely in small fragments).

So far, only fragments of 3 columns are known, mostly upper and middle register. The line(s) in the lower register are still not known.

The seal holds the Horus name of Djedkare. The officer held a title in connection with an institution related to the Mankauhor and the *pr-aA*.

Altogether, 7 replicates have been identified so far. The seal is ascribed to sealings P6816j, P6817o. P6817p, 6817q, 6819cc, P6820ii, 6822rr. One further potential candidate is still under evaluation (6821kk).

All replicates belong to the set of museum registration numbers P6815-6823 (excavation reg. no. 595/I/1982). The sealings were attested in the storage room CR (west line of the northern storages of the early temple).

Only 2 out of 7 replicates (29%) were identified with respect to typology of cretulae, both being of peg and string type (1 PS, 1 mPS). In the case of P6820ii, the whole piece of the thus far unidentified type has been preserved.

Seal of No. 245 / Seal of the Priest of Re and Hathor

The biggest fragment of this seal was published in Verner et al. 2006.: 266, No. 245, with the suggestion to see a replicate in No. 243.

The reconstruction of this theoretical seal originated with the recurring motive of two divine figures standing face to face, holding together the was-sceptre. Both figures have solar discs above their heads, and the right figure has a longer gown and horns. They probably represent Re and Hathor. The motive is placed in the upper register in intercollumnium between serekhs with the Horus name of Nyuserre. Falcons on both flanks are looking to the left. Closely to the left, there are miniature signs of *Hm-nTr*, therefore Verner suggests reading the composition as part of the title *Hm-nTr ra Hw.t-Hr m st-jb-ra* (reading continues down the intercollumnium)(Plate XII.1–2).

There are likely variants of this motive. Sealing P7196i from the same find context as No. 245 (i.e. P7197g) in the room XJ has a cartouche with double border right on the left of the motive and cannot be connected with other sealings (Plate XII.3). Sealing P7190i (room AI, located not far from the XJ and possibly even closer to the dump route of XJ) shows a right flanking falcon oriented to the right, while possible traces of a left flanking falcon suggest that he is looking to the left. On the sealing P7196c from the same context as No. 245, there is a possibly close variant, preserved only partially (right figure preserved from the waist down; left one only with legs; this time the skirt might be worn by the right figure) but continuing down the column includes string "*m st-jb-ra*" like in No.

245 (with, however, a slightly different set up of signs in the column). The publication further suggests a similar motive on No. 161 and variant with the Hathor on the left on No. 122; both sealings are part of the Cairo subcorpus and will be studied in the future.

The same seal as No. 245 (P7197g) is replicated on sealings P7198b, possibly on P7196h, possibly P7197k, possibly P7197a.

Titles attested on the seal are *Hm-nTr ra Hw.t-Hr m st-jb-ra*, *Hr.j-šta*, *Hm-nTr nTrj-bA.w Ra-nfr=f*. Another intercollumnium preserves string *ptH* and *xnt.(j) Tnn.t*. Detail from the side of P7197k suggests that *wab* might be also connected in the string of titles.

All replicates belong to the set of museum registration numbers P7196-7198 (excavation reg. no. 108/I/1985). The sealings were attested on the floor in the entrance to the room XJ.

Only 2 out of 5 possible replicates (40%) were identified with respect to typology of cretulae, both being of the peg and string type (1 m2PS, 1 iPS).

In the future, the seal will be evaluated in the broader context of sealings from the Egyptian Museum. Already in the Náprstek Museum corpus, the seal design (and the set of replicates) might be extended by columns with epithets mentioning Bastet (and *pr-jj*) or Khentytjenenet, but it is not certain if all the extensions would fit on the surface of one cylinder. Caution is here much required as the existing evidence suggests multiple seals of *Hm-nTr ra Hw.t-Hr m st-jb-ra* even in the same (or close) find context.

Seal of the sealer of the finest offerings

This seal was reconstructed from fragments revolving around titles *jm.j-x.t pr-ʿHD*ˀ and *xtmw HAt Htp.wt* (cf. Jones 2000: 772, No. 2805)(Plate XIII.1). A surprising feature of this seal is the Horus name of Khafre. A cautious collation was conducted, because preserved serekhs were fragmentary and not always clear (suggesting the possibility of misreading the otherwise more common Horus name of Neferirkare *Wsr-xa.w*), and in the Raneferef pyramid temple the presence of sealings created by such an old seal would require extraordinary explanation. Eventually, sealing P7199d provided a convincing view of both signs of the name *Wsr-jb* in a rectangle (Plate XIII.1 Middle). Moreover, the exact found context provided sealing P7200e created by a different seal showing a rectangle topped by a falcon with the clearly legible Horus name *Wsr-jb*, this time arranged in two columns (Plate XIII.2).

The seal holds the Horus name of Khafre. The officer held the titles *jm.j-x.t pr-ʿHD*ˀ (cf. Jones 2000: 286, No. 1037, under-supervisor of the Treasury) and *xtmw HAt Htp.wt* (cf. Jones 2000: 772, No. 2805, sealer of the best [quality] offerings).

Six, or possibly up to eight replicates have been identified so far. The seal is ascribed to sealings P7199b, P7199d, P7199e, P7200a1, P7200b, P7200f and possibly to P7199i and P7199h.

Four columns are reconstructed, mostly upper and middle register. There is an option to connect the seal with the lower registers. Both upper intercollumnia with officer's titles seem to alternate symmetrically. If this conclusion is correct, then the design would have to cover 4 or 8 columns. The lower register, consisting of at least one line under the serekhs, is not preserved in the full length of four columns, but there is the possibility that it could eventually exceed the width of four columns (such an eventuality would require the otherwise less likely existence of 8 columns of design).

All replicates belong to museum registration numbers P7199-7200 (single excavation reg. no. 120/I/1986) and were found in the room CAa in the central part of the Intimate Temple in between the two floor levels.

Out of 8 candidate fragments, four bore imprints of textile on the reverse, though the exact type is not certain; it could be bag (2 mbag) or either bag or indirect jar sealing (2 mbag/IDJ). Four cretulae fragments were left without type ascription, some of them rather small.[91] The find context of the room CAa is one of two rooms with the most potential bag sealings, having 5 of them out of 23.

One further cretula from a different context (P6805e found in the not-so-distant room CE in the Central area of the Early Temple in the layer 40–60 cm above the floor) was also considered as a replicate of this seal (cf. section "Sealing with an odd Horus name, P6805e" in chapter 3.7). It contains a puzzling imprint consisting of similarly looking (yet not clearly the same) Horus name and fragments of two titles that could be identical with those on our seal. Nevertheless, the niches of the serekh and perhaps the width of the serekh collides with at least some of other fragments from the CAa context.

We are left with the puzzle of how the sealings imprinted by someone whose seal was active (or at least issued) during the reign of Khafre slipped into an archaeological context about one century older. The number of fragments makes a chance incursion less likely. Would it be possible that some persistent objects stored as prestigious "souvenirs" could have been dedicated to a mortuary cult with such delay? Or, would it be possible that such objects were even relocated from the mortuary cult of the king's predecessor, perhaps in some play of symbolic tokens of respect? In any case, further study should investigate other (non-sealing) objects from the respective find context and the rich history of the room. The sealings were found in between two floors in the room which was originally part of a broad entrance hall. The hall was divided into smaller rooms, possibly during the reign of Wenis and in association with the burial of two damaged models of cult boats in room DH (Verner et al. 2066: 35 ff., 143)

Seal of No. 26 / Seal of the serekh-parade

This seal was reconstructed from fragments revolving around the iconographical feature of three figures holding hands, topping the serekh of the king Djedkare. First figure holds a was-sceptre (Plate XIV). Replication of this seal was already identified by Miroslav Verner (Verner et al. 2006: 216, Nos. 26, 27, 28). Horus name and nomen are written in columns. Observation of obverse of the sealing P6815a and of the space distribution in the rectangle in P6822uu suggests the extraordinary option that the serekh could have consisted of three columns – nomen in the central column, flanked by Horus names. Perhaps the three figures topping serekh could have an analogy in three royal names, if such a reconstruction of the rectangle eventually prevails. It must be admitted that on other sealings, the existence of the third column is less convincing. Sealing 6819bb possibly connects the rectangle with the niches of the so-called "type with 8 vertical lines". In the upper register of the intercollumnium, a prominent depiction of the cartouche of king Raneferef takes place, possibly in connection with the title(s) written below. The feature to the left of the cartouche is readable only with difficulty; Miroslav Verner suggests a figure "seated on the throne and holding a flagellum" (Verner et al. 2006: 216, No. 27).

[91] The classified cretulae are on average of mass 21 g (interval 5–39 g); those of unassigned type have an average mass of 5 g (interval 2–9 g).

So far, most sealings are centred around the eponymous feature, and only fragments of titles are known. The official held titles including elements *xtmw ⸢nTr⸣* and sequence of *Hm-nTr* and *Hr.j s*[*štA*](?).

Up to 5 possible replicates have been identified so far. The seal is ascribed to sealings P6815a, P6818s (No. 26), P6820jj (No. 27), P6822uu (No. 28) and possibly also P6819bb.

All replicates belong to museum registration numbers P6817-6823 (excavation reg. no. 595/I/1982) and were found in the storage room CR in the Northern Sector of the Early Temple, in the eastern part of the room, south of the stairway in the layer of clay and sand above the threshold level, ca. 20 cm thick.

Three bigger cretulae (60%) do have interpretable reverses.[92] Two are the peg-and-string type (1 PS/2PS, 1 iPS). The third sealing (the uncertain replicate P6819bb) shows an imprint of slightly twisted textile and qualifies for the possible bag sealing.

Concluding thoughts

The fact that replicate seals were recognized in the rooms like AI, CR, CAb could be an effect of the fact that there were large sets of cretulae found precisely in those rooms. Nevertheless, the strict regionality of replicates is beyond mere coincidence and is so far one of the most important and unexpected conclusion of the study. It will be tested in context of the complementary corpus from the Egyptian Museum.

Name	Repli-cates	Rooms	Reign	Types	Titles
Seal of No. 154 / Was-ankh-was	14	AI	Djedkare	PS (2), 2PS (2), mPS (2), iPS (2)	*Hr.j-sštA*, *jr.j-mDA.t nswt*, *ny Xrt-a*
Seal of "chancy bull"	7	CR	Djedkare	PS (1), mPS (1)	[...] *pr-aA*, [...] *Mn-kA.w-Hr*(?)
Seal of No. 245 / Priest of Ra and Hathor	2–5+	XJ	Nyuserre	m2PS (1), iPS (1)	*Hm-nTr ra Hw.t-Hr m st-jb-ra*, *Hr.j-šta*, *Hm-nTr nTrj-bA.w Ra-nfr=f*, *wab*(?)
Seal of the Sealer of finest offerings	6–8	CAa	Khafre(!)	mbag (2), mbag/IDJ (2)	*jm.j-x.t pr-⸢HD⸣*, *xtmw HAt Htp.wt*
Seal of the serekh-parade	4–5	CR	Djedkare	PS/2PS (1), iPS (1), mbag (1)	*xtmw ⸢nTr⸣*, *Hm-nTr*, *Hr.j s*[*štA*](?)

[92] The classified cretulae are on average of mass 43 g (interval 32–64 g), those of unassigned type have an average mass of 6 g (interval 2–10 g).

3.5 Idea of the second level of analysis of the distribution of authority of identified actors

Above, in chapter 3.3, we considered the spatial distribution of sealings as referring to particular administrative titles, while the analysis was based on the explicit evidence of the respective titles on the fragments. This might be called the first level of analysis.

After we have started to reconstruct theoretical seals of some of the actors, another option opens up. We could follow the spatial distribution and concurrencies of all epigraphical features ascribed to theoretical seals. Because we are shifting our attention from isolated fragments to evidence of activity of actors who used the reconstructed seals, the replicates would attest not only explicitly present titles, but also titles (or epigraphical features) implicitly present in the whole theoretical seal. In theory, this could help if the replicates were dispersed in multiple rooms and only limited parts of the sealing design were explicitly attested in different rooms. The surprising strict regionality of the so-far reconstructed theoretical seals makes this level of analysis superfluous. Perhaps it would find its use if seals that were used in different places would be found in the future.

3.6 Areas of the pyramid temple in the reflection of clay sealings

Present list summarizes (and sometimes comments) the finds from the perspective of particular areas of the Raneferef's pyramid temple.

Northern sector

One has to note that differences in between the finds originating in particular rooms is high. Actually 47% of all sealings from the sector that are in Náprstek Museum comes from single storage room CR. The same room is also exclusive place of activity of two theoretical seals: "Seal of Chancy bull" and "Seal of serekh-parade. Both store rooms CR and CS contain almost 72% of all finds from the area.

Part	Room	Finds	Level	Type	Ruler in serekh	Titles	Notes
West	CO	P6804 (2)	20 cm below wall crowns				informal (ornament)
		P6807 (3)	0–20 cm a. f.	mPS (1), mPS/box (1)	Wenis	*zš*, *Hr.j-sštA*	
	CP	P6808 (5)	0–20 cm a. f., destructions	topper (1), poss. bag (1), mPS (1), iPS (1)		*Hr.j-˹s˺š*[*tA*], *Hm-nTr [...] Hw.t-Hr m st-jb-ra*	whole topper; incised sealing;
	CQ	P6824 (3)	30 cm a. fl.		Djedkare		
		P6828 (2)	fill-up of the stairway area	mbag/mIDJ (1)	Menkauhor, Nyuserre	*zš [...] pr-aA*, ˹*Hm-nTr*˺, *wab (n)* [*nT*]*rj-b3w r´-nfr=f*[93]	
	CR	P6815-23 (54)	0–20 cm. a. the threshold	PS/2PS (1), mPS (5), PS (5), iPS (3), IDJ (1), mIDJ (1), bag (2), mbag (2),	Djedkare	[...] *pr-aA*, *sHD-zš*, [...] *zAb*, *Hm-nTr*, *Hm-nTr* ˹*ra-nfr=f*˺, *xtm(w) nTr*(?), [...] st-jb[-ra], *wDa-*	Seal of Chancy bull; Seal of serekh-parade; cretula with the reverse imprint; incised sealing

[93] The line is corrupted. Either *wab* title or *Hm-nTr* title could be connected to fragments [*nT*]*rj-ba.w* and cartouche of *ra-nfr=f*. Classifier O 25 is missing, though.

				bag/IDJ (1)		*mdw* [...], *wab*, *zš*, *_zš n xtmw-nTr*, [...] *Hw.t-Hr*	
		P7188	floor level		Djedkare	[...] *pr-aA* [...]	
	CS	P6829 (9)	30 cm a. fl.	mPS (1), iPS (1)	Wenis	*Hm-nTr*, *wab*, *jm.j-ra wp.t*, [...] Hw.t-Hr	incised sealing
		P6830	pit after ripped floor block			*... zA ...*	
		P6831-33 (19)	opening in the broken floor (20 cm below fl.)	mPS (3), iPS (1), IDJ (1)	Nyuserre, Menkauhor, Wenis	*Hm-nTr*, *wab*, *pr-aA*, *jm.j-ra wp.t*	
Corridor	CU	P6806	ca. 50 cm a. f.	mPS	Pepi I.		
East	CV	P6810 (4)	0–30 cm a. fl.	IDJ (1), mIDJ (1)		*zš nswt*, *pr-aA*, *sHD wab* [...][94]	
	CY	P6813 (2)	0–30 cm a. fl.	mPS (1), mbag (1)			
	CZ	P6812 (10)	0–30 cm a. fl.	mPS (3), iPS (1), bag (2)	Nyuserre, Djerkare	*xnt.j-š*,	incised
		P6827	fill-up in the stairway area	topper	Djedkare	[*jr.j*]-ꜥ*x.t*ꜣ-*pr-aA*, *wab*, *Hm-nTr*(?), [... *nTry*]*bA.w*[...]	whole piece

Southern sector

The southern sector is heavily underrepresented in the Prague corpus. Only 12 fragments are present, 6 from the DY and DK rooms. Nearly half of all sealings from the area and even all the identified sealings from the are are of peg and string type.

In the set P7193, elements preserved on obverses suggest title [*H*]*rj*-[*s*]*štA n*(sic) [...] (alternatively [...] *štA(w) n* [...]), another *Hr.j-s*[...] and yet another [...] *n Hw.t-wr.t*. Definitely *štAw* or *sštA* together with *n Hw.t-wr.t* are attested as parts of titles of "secretary of the (/every) secret judgement of the

[94] Relation to some of the other pyramid complexes is likely, see above P6810d in subchapter on wab titles.

Great Court (*Hr.j-sštA n wDa-mdw štAw* (*nb*) *n Hw.t-wrt*)", cf. Jones 2000: 615 f, Nos. 2257, 2258. It is to be admitted, however, that the connection between the fragments remains speculative.

P7193d attests the element *wab* or, speculatively, *s[HD] wab*; there is also a fragment of the throne with a sitting figure, either royal or divine. Another imprint on the edge of the same cretula shows possible classifier O 24 together with signs which could allow reading *st-jb*-[*ra*], thus it might represent an element of some title relating to the sun temple of Neferirkara.

Room	**Finds**	**Level**	**Type**	**Ruler in serekh**	**Titles**	**Notes**
DK	P7194 (5)	sandy layer below the floor	PS (3)	Djedkare, Nyuserre, Weserkaf(?)	*Hr.j-sšta*(?)	
DY	P7193 (6)	sandy layer below the floor	PS (2)	Neferirkare, Nyuserre	[*H*]*rj-sšta n* [...] *n Hw.t-wr.t*?; *wab; st-jb-ra*	

Central sector

Fragment of the stopper P6803c preserves several subtle elements of titles from the lower lines of the seal. Possibly it refers to the wab priest related to Neferirkara or some of his institutions, and possibly also the title of hairdresser of the Great House (cf. Jones 2000: 310, No. 1132).

The peculiarity of finds from the room CAa were discussed above (the likely presence of different sealings with the Horus name Khafre and the sort of concentration of bag sealings.)

Room	**Finds**	**Level**	**Type**	**Ruler in serekh**	**Titles**	**Notes**
CAa	P7199-7200 (19)	in between the floors	IDJ/bag (2), mbag (3), IDJ (2), mPS (2)	Neferirkare, Khafre, (Djedkare?)	*Hm-nTr Hw.t-*Hr, jm.j-*x.t pr-HD*, *xtmw HAt Htp-wt*, *zAb aD-mr,* ⌜*smAa*⌝ *wDa-mdw n Hw.t-wrt*	Seal of the sealer of the finest offerings
CB	P6802	40–60 cm a. fl.	possibly bag		[...]*htp.w*?	
CE	P6805 (7)	40–60 cm a. fl.	DJ (2)	Neferirkare, Raneferef, [...][95]	⌜*xtmw*⌝ *HA.t Htp*[*.w*],	incised

[95] Surprisingly, either Horus name *wsr-jb* or *nTr(j)-bAw*. Cf. section "Sealing with an odd Horus name, P6805e"in the subchapter on Informal Sealings and Peculiar Finds.

CF	P6803 (5)	level of preserved walls	stopper (2), DJ (1), bag (1), 2PS (1)	Neferirkare, Nyuserre	*Hr.j-sštA*, [...] *pr-HD n xnw*, *jr*(*w*) *šn pr-ɑA*(?)	whole bag sealing
	P6809 (2)	0–30 cm a. fl.	poss. bag (1), mPS (1)		[...] *n wAD.t*	incised
DH	P7189 (2)	layer of dark sand, close to the N barque	DJ (2)	Sahure		
CN	P6814 (5)	0–30 cm a. fl.	bag (1), PS (1)	Nyuserre, Shepseskare?	[...] *n Xnw*, *pr HD n* [...], *xtmw*	semiformal sealing

Entrance area of the Early Temple

Room	**Finds**	**Level**	**Type**	**Ruler in serekh**	**Titles**	**Notes**
CT	P6826 (4)	0–40 cm a. fl., fill-up, under the burial	stopper (4)	Raneferef, Nyuserre	*Hr.j-sštA*, *Hm-nTr*, *jr.j* [...] *mDa.t*, [...] *m st-jb-ra*, *jm.j-ra wp.t*	whole pieces
BD	P6825	50 cm below wall crowns		Neferirkare	*wab*, [...][96]	

”City of priests”

In the area, seven sealings are present in the studied corpus. They come from several rooms/houses both in the North Row of Houses (total 4 cretulae in rooms M, F, Z) and in the South Row (total 2 cretulae in rooms S, Y).

Only two of them (28%) could be (both with uncertainty) assessed with regard to the typology of reverses, both from the Northern Row. Small P6796 from room Z (No. 7 in Verner et al. 2006: 211) could represent document cretula, P6798 from the room M is possible peg-and-string type.

One of the sealings (P6784) brings the clear set of names *mrj-ra – mrj-tAwj* – [*p*]*pj* in the serekh, thus attesting the possible timeframe of king Pepi I. This sealing was found in the southeast

[96] Possibly also ⌜s⌝HD + either *wsxt* or *zš*.

corner of the room F in the layer ca. 10 cm above the floor, apx. on the level of column foot. Another sealing from the room Y holds an unclearly preserved fragment of cartouche, possibly *ppj*.

Two imprints of informal seals were present. One sealing retained a checker design, similar to one that is attested on the stamp seal with the reg. number 731/I/84 (cf. Verner et al. 2006: 206, No. 7, cf. photo in Plate III) found in the room DC.[97] Another informal sealing (P6798) is incised (see below subsection on "peculiar finds"). This would be the subject of a further study, but so far the possibility that its design is merely ornamental seems to be likely.

Three sealings from the North Row of Houses seem to bear a *xnt.j* string. In the room Z, one sealing attests [...]*xntj.-š*, another one [?][98] *xnt.j* [...] while details of the *xtm* sign suggest that it was likely created by a different seal. The sealing from the house F attests fragment *xnt.j* preceded by possibly related *m* sign (thus possibly *jm.j*-[*ra*] *xnt.j*[-*š*?]).

Two sealings from the North Row of Houses possibly bear a fragment of the *xtmw* element. The latter sealing from the room F adds *jr.j-xtm.t* ("one who is in charge of sealed items"[99]). One sealing from room Z includes an ambiguous imprint which could be read as possible *xtmw* or corrupted *anx*.

Find contexts in the area differs (cf. summarizing table below); cretulae were not found in the floor level in the strict sense, although at least finds from rooms F and M could be approached as such in broad sense.

Part	**House**	**Finds**	**Level**	**Type**	**Ruler in serekh**	**Titles**	**Notes**
North Row	S	P6797	30 cm a. fl.				informal (checker)
	M	P6798	0–40 cm a. fl.	mPS (1)			informal – incised
	F	P6784 (2)	10 cm a. fl.		Pepi I.	*jmj*-[*ra*]-*xnt.j*[...], *jr.j-xtm.t*	
South Row	Z	P6796 (2)	40 cm a. fl., fill-up	document (1)		*xtmw*(?), *xnt.j-š*	

[97] Tiny details visible in the final row of the pattern on the P6797 are not recorded on the published drawing of the seal, which puts a direct relationship between the particular seal and the sealing in question. Variants of the checker design possibly were not entirely rare on informal seals in the Raneferef pyramid complex; a small irregular checker design is also attested on the fragment of an unpierced limestone cylinder, reg. number 231/I/1982, kept in Náprstek Museum as P6841.

[98] Perhaps *HD* sign, vertical sign (*Hm*?) and another simple vertical sign are attested, yet an easy solution like sHD would be problematic.

[99] Analogy taken from Jones 2000: 334, No. 1231 "he who is in charge of the sealed goods of the Great House". The sequence on the sealing, though continues by a horizontal sign, likely classifier Y 2, which is not strictly mentioned in Jones' Index.

	Y	P6799	60 cm a. fl., fill-up				

House of the knife

Room AA (3)

Sealing P6795a with the possible cartouche does have a textile imprint on its reverse; the surface is uneven, yet the fragment is too small to decide if it is a bag sealing, indirect jar type, or something else.

Room	Finds	Level	Type	Ruler in serekh	Titles	Notes
AA	P6794	0–30 cm a. fl.				
	P6795 (2)	0–30 cm a. fl.		Isw (in cartouche?)		Sealing of a possible FIP ruler?!
AI	P7190-92 (38)	layer above the floor	PS (12), 2PS (2), mPS (7), iPS (3)	Djedkare, Nyuserre	*Hr.j-sštA*, *Hm-nTr*, *zAb*, *zš*, *Hm-nTr ra Hw.t-Hr*, *jr.j-mDA.t*	*jnb HD*(?); Seal 154
XJ	P7195 (6)	layer above the floor	IDJ (1), mPS (2)	Djedkare, Menkauhor, Nyuserre	*xtm.w-DfA.w*, *Hm-nTr ra-nfr=f*, *wab nswt*, *zš (pr-HD)*	
	P7196-98 (38)	on the floor	m2PS (3), mPS (3), iPS (7), PS (5), mbag (1), mIDJ (1)	Nyuserre, Neferirkare(?)	*Hm-nTr* (+ O24), *Hm-nTr ra Hw.t-Hr m st-jb-ra,* zš, *smaA wDa-mdw n wsxt*, *Hr.j-sštA*, *wab*, *zš mAa.t*, [...] *pr aA*, *jr.j-x-t pr aA*	Seal 245

Entrance of the Extended temple

The area contained 23 cretulae (15 cretulae in two registration numbers in the room E and 8 cretulae in three registration numbers from the corridor A, labelled as “room 8” in the early phase of the excavation). Contexts of finds vary; only 4 cretulae (set P6783) originate in the nearby floor level, resp. were found on the level of the foots of columns.

Regarding the typology of reverses, 15 cretulae (65%) were identified. There is a high presence of cretulae with imprint of flat wooden objects, most likely wooden boxes (26%, i.e. 6 cretulae total: 5 of them from the refuse layer in the eastern part of room E). All potential peg-and-string types makes also for six (26%, 3 possible PS from the room E; room A provided 1 PS, 1 possible PS and 1 implied PS). Bags are possibly attested on up to three. One possible bag sealing from room E. In corridor A, there is one probable bag sealing, and also the only whole piece from the area (P6783b), the other is not certain; it could be either the bag or indirect jar type. The remaining eight fragments remain undetermined.

Only a couple of sealings do have Horus names in serekh. Reigns attested from the sealings close to the floor-level of room A are Wenis (P6783a, c) and Pepi I. (P6783b). Cretulae from the refuse and destruction layers in the room E attest Horus name of Teti.

Sealings P6800a and P6800b were published as Nos. 14 and 13 (Verner 2006 et al.: 212 f.). Miroslav Verner suggests they are replicates of the same seal. There could be more replicates (e.g. P6800j), but the attempt to reconstruct the theoretical seal was abandoned due to crude and fragmentary preservation of obverses (merely the cartouche of *ttj*, elements *mrr* and parts of serekh are preserved).

The title *Hr.j sšta* is attested both in room E (P6800a, box sealing, reign of Teti) and in corridor A (P6783b, possible bag sealing, reign of Pepi I.). *Hm-nTr* title was found on sealings in corridor A (possibly also with the connection to *Hw.t-Hr* in P6781a and possibly with the connection to the Pyramid of Raneferef during the reign of Wenis in the case of P6783a). Rather rare is the sealing with the part of a title related to phyle (*zA*, sign V 16) from the corridor A (P6783c, layer close to the floor). Reading *wr zA wD.t* "great one of the phyle Wadjet" would be tempting, but the bird standing unusually *tete a tete* to the possible *wAD.t* resembles more *w* than a *wr* sign.

Several sealings include cartouches of various kings, mostly Teti (usually with *mr* elements), Raneferef (possibly related to the priestly office in the pyramid) and Jzj (Djedkare) in a composition where the relation of fragments is not yet clear.

Room	**Finds**	**Level**	**Type**	**Ruler in serekh**	**Titles**	**Notes**
E	P6800 (12)	110-130 cm a. f., refuse	box (5), mPS (2), mBag (1)	Teti	*Hr.j-sštA*	
	P6801 (3)	50-80 cm a. f., destructions				
A	P6781 (2)	ca 1 m below wall crowns			*Hm-nTr (Hw.t-Hr?)*	
	P6782 (2)	ca 1.5 m below wall crowns	box (1), PS (1)	(Teti?)		
	P6783 (4)	above floor	iPS (1), bag (1), IDJ/bag (1)	Wenis, Pepi I.	*Hr.j-sštA*, zA wAD.t, *Hm-nTr*(?)	whole bag sealing

AC area

Together 30 fragments were studied, 9 were determined in terms of typology.

Features on the stopper P6791 (“lady in shower stall” replacing niches, serekh of Djedkare, common title Hr.j-sštA) do have analogy in fragment P7190 from the close room AI in the House of the Knife. Two fragments are not enough to reconstruct a theoretical seal, yet it may serve as evidence of possible relations regarding the disposal of waste across the floor of the House of the Knife.

Room	Finds	Level	Type	Ruler in serekh	Titles	Notes
	P6785	60 cm a. fl., destructions	iPS			incised
	P6786 (9)	60–120 cm below surface, refuse	mPS (1), iPS (1), bag (or stopper?) (1)	Wenis(?)		
	P6787 (4)	80–120 cm below surface	mPS (1)	Teti	*xnt.j-⌜š⌝* ...	whole incised sealing
	P6788	60–120 cm. below surface, refuse?		Wenis	Hm-nTr	unavailable for study
	P6789 (3)	0–30 cm a. fl., sand		Wenis		
	P6790	30 cm a. fl., fill-up/refuse layer		Djedkare	*Hr.j-s*[...]	whole sealing
	P6791	0–30 cm a. fl., dark fill-up	stopper	Djedkare	*Hr.j-sštA*, *Hm*-[*nTr*](?)	
	P6792 (10)	30–120 cm a. fl., destr. layer	PS (3), possible PS (1)	Djedkare, Sahure	*Hr.j-s*[...]	
	P6793	100 cm a. fl., sandy fill-up north of AC				

3.7 Informal sealings and peculiar finds

Jsw, P6795a

In the fill-up, yet not far from the floor level (0-30 cm) of the room AA in the front part of the House of the Knife, a tiny[100] sealing was found.

A surprising feature of the sealing P6795a is a fragment of a crude oval, possibly cartouche with two signs written inside. The signs inside make the word *jsw* (Plate XV.1). If this element was a royal nomen, the only known analogy would be a name of the possible king of the Eighth Dynasty *Jsw* (cf. Hannig 2006: 1288). The name is otherwise attested as a part of the graffito mentioned by Weigall in ASAE (Weigall 1908: 110). The graffito from Shebaikeh (between Gebel Silsila and Silwa) mentions the titles and name of *sA ra [...] Xrj Hbs Hr.j tp Jsw-anx* (with the J*sw* part written in cartouche). Weigall estimated that Jsw could denote the Hyksos king Assis, yet he was opened to inclination that it is earlier.

Sealing with an odd Horus name, P6805e

Multiple imprints of the serekh on the big cretulae P6805e opened the possibility of the presence of the unattested or rare Horus name in the pyramid complex. Therefore, this sealing was originally meant to appear in the chapter of peculiar finds. The imprint is rather "shallow", lacking sharp details, yet the Horus name is imprinted on the cretula several times, which should at least exclude the imperfection of one particular imprint. The Horus name consists of two signs. The first resembles most likely nTr. Despite the similarity of this sign with the wsr sign, none of the several imprints seem to hint such a reading. The second sign is small vaguely oblong symmetrical sign, sometimes suggesting the reading *jb*. With the kind help of the curator of the museum, Dr. Onderka, a highly detailed photograph of one of the serekhs was conducted. The reproduction hints reading *nTr-bA.w*, which would unexpectedly point to the name of the Eighth Dynasty ruler Neferkauhor Chuwihapi. Despite the surprising result, the presence of the singular sealing from the period out of presumed functional frame of the temple is not completely ruled out and is neither without analogies. The find context of the seal is the western part of room CE in the Central area of the Early Temple in the layer 40–60 cm above the floor.

Such were the results when the sealing was studied alone. After the whole Prague corpus was studied, partial analogy was recognized also in two title fragments in two intercollumnia. There is ⌜xtmw⌝ HA.t Htp[.w] in one and possible ...x.t pr-HD in another. This context could eventually overrule the original reading of the Horus name and would suggest that the sealing is more likely another replicate of the theoretical Seal of the Sealer of the finest offerings. The reading of the serekh would then adjust to the (no less surprising) Horus name *wsr-jb*, belonging to King Khafre. Unfortunately, the serekh in question is rather narrow, only about 6 mm (+/-1) wide, and niches attested on the P6085e sealing nearly rule out that they would comply with the 8-lines niche type and 9 mm (+/-1) serekh, attested on some of the sealings associated currently with the Seal of the Sealer of the finest offerings.

[100] Mass 7 g.

Informal sealings

Several sealings with informal sealings were observed. Degree of "deviation" from the pattern of official seal varies. There is one cretula with incised ornamental design (P6798) from the room M-One sealing with checkers design (P6797) from the room S. Pair of sealings with ornamental design P6804a and P6804b comes from the higher layers (ca. 20 cm below the high end of walls) of the storage room CO.

Status of the sealing P6814c from the room CN is not clear. The obverse shows some seemingly standard signs, but the dominant animal (duck) is in topsy turvy postition to the adjacent *Htp* sign. There are no obvious traces that would suggest mixed impression; the (in)formality of the sealing is inconclusive.

Sealing P6814d from the same find context seems to contain a serekh, but not a composition of space usual for official seals (Plate XV.2). Crude sets of possible signs suggest a close analogy (or even origin) in the cylindrical seal 103/I/85 recovered in room XL in the House of the Knife. Cf. Verner 2006 et al.: 208, No. 15, cf. also plate IV.) A later seal holds a serekh of King Djedkare. The eventual existence of the sealing produced by seal No. 15 might give a new light to the functionality of this seal, as it has been originally described as merely a model seal.

Incised sealings

Eleven cretulae with incised markings were found (3% of the Prague corpus); ten possibly bore hieratic signs, one seems to be purely ornamental. One of the incised sealings with hieratic inscription present a unique example of the hybrid type which combines both incised marks and an imprint of the cylinder seals. As such it will be described in detail in its own section.

Two of the incised cretulae are likely a whole piece (P6787c and P6829i).

Five of the Incised sealings (45%) are considered as the possible peg-and-string type; another one is a bag sealing.

Incised sealings are most frequently found in various storage rooms (7 out of 11), yet mostly as one and never more than two fragments in one room, thus no bond to a particular storage area could be claimed. Two fragments were found in fill-up and refuse contexts (AC area), one in house M in the "City of Priests" and one in a corridor (CF).

Room	Area	Piece	Level/Context	Type	Special notes	
AC	"Surroundings"	P6785	60 cm above floor in mudbrick destruction	mPS		
AC	"Surroundings"	P6787c	refuse?, 80-120 cm below surface		whole piece	
CE	storage room	P6805c2	40-60 cm			

	(Central sec.)		above floor			
CF	corridor (Central sec.)	P6809b	0-30 cm above floor	mPS		
CP	storage room (Northern sec.)	P6808b,	0-20 cm above floor	mbag		
CR	storage room (Northern sec.)	P6820gg	0-30 cm above the threshold	mPS	incision + imprint of the seal	
CS	storage room (Northern sec.)	P6829i	30 cm above the threshold			
CZ	storage room (Northern sec.)	P6812h	0-30 cm above floor	PS		
AI	storage room (House of the Knife)	P7192f		mPS		
AI	storage room (House of the Knife)	P7192g				
M	Northern Row of Houses (“The City”)	P6798	0-40 above floor	possibly peg-and-string type	ornamental	

Hybrid sealing combining imprint of the cylinder seal and incised text

Piece P6820gg from the storage room CR (found in the layer 0-30 cm above the threshold) combines, in a unique way, an incision and an imprint of the fragment of the cylinder seal (Plate XVI.1). The imprint captures a fragment of two lines from the lower end of the cylinder. Attested elements of titles contain *wab*(?) *pr-aA* and possible ˹*Hm*˺-[*nTr*] title, possibly related to a pyramid (deduced from the adjacent possible sign O 24).

The piece is unique, certainly in the context of the studied corpus and perhaps beyond it (resp. at least one more sealing of such kind is also in the subcorpus in the Egyptian Museum in Cairo).

Cretula with reverse imprint

Set of sealings from the storage room CR included one piece of cretula impressed in reverse relief (Plate XVI.2). Such a feature is so far unique in the corpus under study. It is a piece of above average size (76x62x29 mm) and mass of 102 g. The typological assesment of the cretula was not successful, but the standard features of the functional cretula were observed (base with uncertain kind of surface imprint, serif on side and mainly the traces of possibly two twines in on the side, where the piece broke.

The obverse was impressed from at least three different angles by different small patterns. This makes unlikely possibility that the cretula could have been impressed merely by incidental contact with some object decorated by relief pattern.

At first the cretula was studied to explore the seeming distant analogy to objects (sort of "token tablets") discussed by Pantalacci (Pantalacci 1996: 363 f.) with reference to Reisner´s idea of "sample sealings". Instead the study of the cretula showed very detailed execution of the hieroglyphs and betrays as its closes analogy faience inlays from the Raneferef's pyramid temple. With respect to dimensions of the patterns as well as the orthography of one of the imprints (*bHdt.j*), it could be theorized that the imprint was dealt by a fragment of faience inlay analogous to the fragment F0981 from the catalogue of excavated inlays (Landgráfová 2006: 106).

3.8 Conclusion

The sealing and unsealing of doors and containers is the routine practice that is optimized for speed and effectivity (cf. Frangipane, ed. 2007: 66). This leaves us the prospect that cretulae are a kind of artefact whose qualities are tightly bound with their functionality, and that the abundant variety of marks that we find on them are signs that we might learn to interpret one day. Such a vision inspired the first part of the presented work and the perhaps tedious analytical approach to the typology and methodology of documentation. Despite the presence of existing typologies, the study always has to adjust to studied corpus, and, in general, there is much work to be done in the field of typology.

The second part of the work attempts to find details regarding the activity and authority of officials (seal holders) who were connected with the operation of the pyramid complex of King Raneferef, either *in situ* or by sealing containers that were regularly sent over there. This was attempted by a search for recurrent seal designs attested on fragments of cretulae found in the area of the complex[101] and a study of the properties of the seal holders and their activity areas where the fragments of sealings were found, what titles were attested on their sealings, and what kind of objects were sealed by their seals. At the same time, the general patterns of the distribution of sealings with regard to space, type, and attested epigraphical features (titles, names of gods and institutions, other iconographical features) were pursued, partly for help to preselect connections useful in pinpointing the further replicates, partly in a search for some general patterns governing the sealing activity in the pyramid complex.

As a result, five seals with recurring sealings were recognized and their functional properties were documented. The most striking functional property of those seals is that all their replicates have been found so far in each one´s respective room; this was either a room where the respective official had worked, or where containers sealed by his seals were exclusively directed. Moreover, in the case of some seals, this result is strengthened by the possible evidence of multiple seals with the same title attested in the same room. This might be hint of the functional property of the respective room (although the case of a re-issue of the seal for the same official cannot be excluded as well).

As for the general patterns of distribution, the results are still less informative, possibly also due to limits of present typology; namely the vagueness of the most frequent types that need (and could be) further divided into distinctive subtypes. Unfortunately, this type covers a wide variety of possible functions, such as sealing doors or wooden boxes. Chapter 2.3 collects insights and observations pertaining to the further advancement and refinement of the typology.

At the moment, a potential correlation might arise with regard to sealed bags. So far, sealings that bore the imprint of official(s) related to the treasury and particularly the treasury of the residence seems to have been used to close bag sealings, but their number is indeed small (cf. chapter 3.3).

As a side effect of the study of the corpus, some peculiar finds were documented and briefly addressed in chapter 3.7. In addition to several informal and incised sealings, the most extraordinary are as follows: a sealing which combines incised notes in hieratic with the imprint of the cylinder seal, a sealing impressed in reverse relief, possibly by a faience inlay of the kind that was found in the

[101] Resp. 314 sealings from the former establishment, that are in the collections of the Náprstek Museum of Prague (cf. chapter 1.3).

same temple, and a sealing with a possible fragment of cartouche that might perhaps refer to an ephemeral king of the Eighth Dynasty. An informal sealing was also found that might attest the use of a seal that was previously taken for a mere model seal.

Appendix: prospects for further study

The corpus under study manifests much potential for continuous study. The presented work has also served as a kind of test of methodology before the treatment of a broader set consisting of, at the least, the complete corpus of clay sealings from the pyramid complexes of King Raneferef and Queen Khentkaus II as a part of the author's dissertation.

In the future study, the typology of sealings must be advanced both by means of a finer differentiation of subtypes and by facing some of the "challenges" preselected within the "typologically important pieces" in chapter 2.3. The homogeneity of sets of sealings ascribed to particular types should be checked, and possible deviations should be identified and revised if necessary.

The sealings have to be related to finds and the remains of architecture in the places of their origin (evidences of doors). The concurrencies of epigraphical features (titles) with other properties of sealings will be displayed in deeper detail. Unfortunately, this appeared to be more time consuming than expected for a full completion within the current work.

With a larger corpus, the diachronic line should be checked as well, not only in relation to the evolution of the construction and use of rooms of the pyramid temple, but also to a possible evolution in the activity of actors or use of containers.

The evidence of sealings needs to be interrelated to information from the Abusir papyri at last.

The individual holders of theoretical seals will be checked against prosopographical sources and information concerning their personal identity, or the identity of "analogous" officials will be looked for.

Bibliography

Alizadeh 1994

Alizadeh, Abras, Administrative Technology and Socio-economic Complexity at the Prehistoric Site of Tall-i-Bakun, Iran in: Ferioli Piera – Fiandra Enrica – Fissore Gian Giacomo – Frangipane Marcella, *Archives before Writing. Proceedeings of the International Colloquium. Oriolo Romano, October 23-25, 1991*. Roma 1997

Bussman 2011

Bussman, Richard, ˝Seals and seal impressions from Hierakonpolis˝, in: Egyptian Archaeology 38, pp. 17–19

Bussman 2014

Bussman, Richard, "Locking and Control: A Door Bolt Sealing from Hierakonpolis", in: Journal of the American Research Center in Egypt Vol 50, 2014

Dubiel 2012

Dubiel, Ulrike, Protection, Control and Prestige – Seals among the Rural Population of Qau-Matmar, in: Regulski, Ilona – Duistermaat, Kim – Verkinderen, Peter, *Seals and sealing practices in the Near East. Developments in Administration and Magic from Prehistory to the Islamic Period. Proceedings of an International Workshop at the Netherlands-Flemish Institute in Cairo on December 2-3, 2009*. Orientalia Lovaniensia Analecta 219, Leuven – Praris – Walpole, MA 2012

Duistermaat 2012

Duistermaat Kim, Which Came First, the Bureaucrat or the Seal? Some Thoughts on the Non-Administrative origins of Seals in neolithic Syria, in: Regulski Ilona – Duistermaat Kim – Verkinderen Peter, *Seals and sealing practices in the Near East. Developments in Administration and Magic from Prehistory to the Islamic Period. Proceedings of an International Workshop at the Netherlands-Flemish Institute in Cairo on December 2-3, 2009*. Orientalia Lovaniensia Analecta 219, Leuven – Praris – Walpole, MA 2012

Dulíková 2016

Dulíková, Veronika, "One of the minor gods: A case study on Khentytjenenet, an Old Kingdom deity of the Memphite necropolis", in: Prague Egyptological Studies, no. XVII, Prague 2016

Emery and Saad 1939

Emery, Waler B. – Saad, Zaki Yusuf, *Excavations at Saqqara, 1937-1938: Hor-Aha*, Cairo 1939

Emery 1963

Emery, Walter B., ˝Egypt Exploration Society : preliminary report on the excavations at Buhen, 1962˝ in: Kush: Journal of the Sudan Antiquities Service. 11, pp. 116 – 120, Khartoum 1963

Engel und Müller 2000

Engel, Eva-Maria and Müller, Vera, “Verschlüsse der Frühzeit: Erstellung einer Typologie”, in: Göttinger Miszellen. Beiträge zur ägyptologischen Diskussion, Heft 178, Göttingen 2000

Ferioli et al., eds. 1994

Archives before Writing. *Proceedeings of the International Colloquium. Oriolo Romano, October 23-25, 1991*, Roma 1997

Frangipane, ed. 2007

Frangipane, Marcella, ed., *Arslantepe V. Cretulae. An Early Centralised Administrative System Before Writing*, Roma 2007

Frangipane 2016

Frangipane, Marcella, “The Origins of administrative practices and their developments in Greater Mesopotamia. The evidence from Arslantepe”, in: *Archeo-Nil 26 (2016). Emergence of the state and development of the administration: the role of writing inEgypt, Near East and China*, Paris 2016

Gheorghiu and Skeates 2008

Gheorghiu, Dragos – Skeates, Robin, *Prehistoric stamps. Theory and experiments*, Bucharest 2008

Hannig 2006

Hannig, Rainer, *Die Sprache der Pharaonen. Großes Handwörterbuch Ägyptisch – Deutsch (2800 – 950 v. Chr.)*. Mainz 2006

Hawas, ed. 2004

Hawas, Zahi, ed., *Pyramidy. Magické symboly starého Egypta*, Čestlice 2004

Hill 2004

Hill, Jane A, *Cylinder Seal Glyptic in Predynastic Egypt and Neighboring Regions*, BAR International Series 1223, Oxford 2004

Hill 2016

Hill, Jane A., Categories of Control. Development of Cylinder Seal Glyptic within the Context of Egyptian State Formation, in: Graff, Gwenola & Serrano, Alejandro Jimenez, ed., Préhistoires de l'écriture. Iconographie, pratiques graphiques et émergence de l'écrit dans l'Égypte prédynastique, Aix-en-Provence 206

Jones 2000

Jones, Dilwyn, An Index of Ancient Egyptian Titles, Epithets and Phrases of the Old Kingdom, Vol. I–II. BAR International Series 866. Oxford 2000

Kaplony 1969

Kaplony, P., Die Siegelabdrücke, in: Ricke, H., ed., Das Sonnenheiligtum des Königs Userkaf. II. Die Funde, (Beiträge Bf 8), Wiesbaden 1969

Kaplony 1977

Kaplony Peter, *Die Rollsiegel des Alten Reichs I, Allgemeiner Teil mit Studien zum önigtum des Alten Reichs*, Bruxelles 1977

Koenigsberger 1936

Koenigsberger, Otto, Die Konstruktion der Ägyptischen Tür, Glückstadt 1936

Landgráfová 2006

Landgráfová, Renata, *Abusir XIV, Faience Inlays from the Funerary Temple of King Raneferef. Raneferef's Substitute Decoration Programme*, Prague 2006

Nolan 2010

Nolan, John S., *Mud Sealings and Fourth Dynasty Administration at Giza*, unpublished dissertation, Chicago, 2010, available at https://oi.uchicago.edu/research/research-archives-library/dissertations/mud-sealings-and-fourth-dynasty-administration-giza [accessed 24. 11. 2017]

Nolan 2012

Nolan, John, "Fifth Dynasty Renaissance at Giza", in: Aeragram vol. 13, no. 2, 2012

Nolan 2013a

Nolan, John, "A Small Clay Label, a Bundle of Linen, and an Ancient Economic Network", in: Aeragram vol. 14, no. 2, 2013

Nolan 2013b

Nolan, John, "Piecing the Story Together, One Clay Sealing Fragment at a Time", Aeragram vol. 14, no. 2, 2013

Nolan 2014

Nolan, John, "A Change of Address: Funerary Workshop Priests Move to New Quarters", Aeragram vol. 15, no. 1–2, 2014

Pantalacci 1996

Pantalacci, Laure, ˝Fonctionnaires et analphabètes : sur quelques pratiques administratives observées à Balat˝, in: *Le Bulletin de l'Institut français d'archéologie orientale 96*, pp. 359–367, Le Caire 1996

Pantalacci 2005

Pantalacci, Laure, Sceaux et empreintes de sceaux comme critères de datation. Les enseignments des fouilles de Balat. in: Laure Pantalacci et Catherine Berger-El-Naggar, eds., *Des Néferkarâ aux Montouhotep. Travaux archéologiques en cours sur la fin de la VI^{e} dynastie et la Première Période Intermédiaire. Actes du Colloque CNRS – Université Lumière-Lyon 2, tenu le 5-7 juillet 2001*, Travau de la Maison de l'Orient et de la Méditerranée N° 40, Lyon 2005

Pätznick 2005

Pätznick, Jean-Pierre, *Die Siegelabrollungen und Rollsiegel der Stadt Elephantine im 3. Jahrtausend v. Chr. Spurensicherung eines archäologischen Artefaktes*, BAR International Series 1339, Oxford 2005

Pinarello 2015

Pinarello, Massimiliano Samuele Pinarello, *An Archaeological Discussion of Writing Practice. Deconstruction of the Ancient Egyptian Scribe*, GHP Egyptology 23, London 2015

von Pilgrim 1996

von Pilgrim, Cornelius, *Elephantine XVIII*. *Untersuchungen in der Stadt des Mittleren Reiches und der Zweiten Zwischenzeit*, Mainz 1996

von Pilgrim 2001

von Pilgrim, Cornelius, The Practice of Sealing in the Administration of the First Intermediate Period and the Middle Kingdom, in: *Le Sceau et l'Administration dans la Vellée du Nil. Villeneuve d'Ascq 7–8 juillet 2000*, CRIPEL No. 22, Lille 2001

Posener-Kriéger 1994

Posener-Kriéger, Le coffret de Gebelein. in: Catherine Berger, Gisèle Clerc et Nicolas Grimal, eds., *Hommages à Jean Leclant, Volume 1, Études pharaoniques*, Cairo 1994

Posener-Kriéger, Verner and Vymazalová 2006

Posener-Kriéger, Paule – Verner, Miroslav – Vymazalová, Hana, *Abusir X. The Pyramid Complex of Raneferef. The Papyrus Archive*. Prague 2006

Regulski 2009

Regulski, Ilona, Early dynastic seal impressions from the settlement site at Elkab, in: Claes, Wouter – de Meulenaere, Herman – Hendrickx, Stan, eds., *Elkab and Beyond. Studies in Honour of Luc Limme*, Leuven – Paris – Walpole, MA 2009

Regulski et al., eds. 2012

Regulski, Ilona – Duistermaat, Kim – Verkinderen, Peter, eds., Seals and Sealing Practices in the Near East. Development in Administration and Magic from Prehistory to the Islamic Period, OLA 219, Leuven 2012

Smith 1995

Smith, Stuart Tyson The Transmission of an Administrative Sealing Systém from Lower Nubia to Kerma, in: Cahier de Recherches de l´Institut de Papyrologie er d´Egyptologie de Lille, N°17, Actes de la VIIIe conférence internationale des études nubiennes, Lille 11-17 Septembre 1994, Lille 1995

Smith 2001

Smith, Stuart Tyson, Sealing Practice, Literacy and Administration in the Middle Kingdom, in: *Le Sceau et l'Administration dans la Vellée du Nil. Villeneuve d'Ascq 7–8 juillet 2000*, CRIPEL No. 22, Lille 2001

Verner 1995

Verner, Miroslav, *Abusir III. The Pyramid Complex of Khentkaus*, Praha 1995

Verner 2014

Verner, Miroslav, *Sons of the Sun. Rise and decline of the fifth dynasty*. Prague 2014

Verner et al. 2006

Verner, Miroslav et al., *Abusir IX. The Pyramid Complex of Raneferef. The Archaeology*, Prague 2006

Wegner 2000

Wegner, Josef, “The Organization of the Temple Nfr-k3 of Senwosret III at Abydos”, in: Ägypt und Levante 10, 2000

Wegner 2001

Wegner, Josef, Institutions and Officials at South Abydos: an Overview of the Sigillographic Evidence, in: in: Le Sceau et l'Administration dans la Vellée du Nil. Villeneuve d'Ascq 7–8 juillet 2000, CRIPEL No. 22, Lille 2001

Wegner 2007

Wegner, Josef, The Mortuary Temple of Senwosret III at Abydos, New Haven – Philadelphia 2007

Weigall 1908

Weigall, Arthur P. B. E., “Upper Egyptian Notes”, in: Annales du Service des Antiquités de l´Égypte, Tome IX, Le Caire 1908: 105-112

Weingarten 2014

Weingarten, Judith, The Sealing Studies in the Middle Bronze Age. I. Karahöyük. II: Phaistos, in: Ferioli et al., eds., *Archives before Writing. Proceedeings of the International Colloquium. Oriolo Romano, October 23-25, 1991*. Roma 1997

Winlock 1955

Winlock, H. E., *Models of Daily Life in Ancient Egypt from the Tomb of Meket-Re' at Thebes*, The Metropolitan Museum of Art Egyptian Expedition, Cambridge, MA 1955

Witsell 2014

Witsell, Ali, “A Return to AA: Informal Seals and Sealings from Heit el-Ghurab”, in: Aeragram vol. 15, no. 1-2, 2014

Supplements:

i. Plates

ii. Table: List of sealings under study