

A GIS-based Study of Cemetery En Echelon

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List of abbreviations

CEE	Cemetery En Echelon
CEEN	North part of Cemetery En Echelon
CEES	South part of Cemetery En Echelon
WCE	Western Cemetery
ECE	Eastern Cemetery
OK	Old Kingdom
MK	Middle Kingdom
FIP	Fist Intermediate Period
GA	Giza Archive Project

Introduction

It is widely accepted among Egyptologists that ancient Egyptian cemeteries can express the socio-economic status of their inhabitants spatially . However, no studies have been yet devoted to research the overall spatial organization of those cemeteries nor to the interrelationships of the individual tombs. Geographical Information Systems (GIS) are currently a well known utility used within archaeological research as a data management tool, but its use in sorting information gained from the field for the purposes of historical research is still a subject of explorative attempts. Though GIS can provide a well-structured descriptive and analytical tool for identifying spatial patterns, its potential is far from being realized in investigating the non- uniformity in the socio-economic status for highly organised societies like Ancient Egypt.

There are three basic categories of use that GIS can be put to: as a spatially referenced database; as a visualization tool; and as an analytic tool. Those three categories can be utilised to explore the socio-economic factors involved in a cemetery on various levels: by the analysis of the spatial distribution of tombs and their components, by calculating the expenditure used for their construction and by determining the privileges of their locations in relation to accessibility and visibility conditions.

1-Aim

In the context of a socio-economic study, the cemetery of Giza offers a wide range of data with a spatial analysis potential. The aim of the present study is to demonstrate the potential of using geographical information systems to analyze archaeological data in an attempt to answer common questions concerning the development of an Old Kingdom cemetery and the socio-economic status of its inhabitants. At the initial stage of the current research, the study area was planned to be the entire Giza necropolis. Covering a little more than 1 square kilometer, the Giza necropolis comprises more than 2300 tombs, including in majority stone or brick built mastabas and a considerable number of rock cut tombs. With a minimum of 2 burial shafts for each tomb, some tombs having even as much as 20 shafts, the estimated total number of shafts would probably exceed 15,000. The gigantic task of burial goods and volume calculations should be consequently imagined. To keep this thesis thus within feasible limits it was necessary as research progressed to choose a smaller cemetery area as representative a sample for the entire Giza necropolis. The cemetery en Échelon, the easternmost part of the Western Cemetery, provides examples of several typical problems

found at Giza and was thus used in the later steps of this study as a microcosm for many of the socio-economic and spatial issues concerning the Giza necropolis.

2-Location and history of excavations of Cemetery en Échelon

The term cemetery en Échelon was introduced by Reisner to describe the three rows of mastabas with numbers 49s, 50s, and 51s, because of their arrangement, the peculiar feature of which was that each core left the chapel end of the core behind it exposed to view from the east.

The same term was extended by Porter and Moss¹ to describe a large number of tombs to the immediate west of the pyramid of Khufu, dividing the area into south and north parts, the former being earlier than the later. Most scholars refer however to the southern part when using the term cemetery en Échelon (hereafter CEE). The south part (hereafter CEES) consists of 25 or 26 (with G 5110) mastabas arranged in three north south lines. The two western lines comprise nine mastabas, the eastern line only seven. The two southern cores of the last mentioned line were never built or else were later destroyed in order to build mastaba G 5110. East of the original lines of CEES were a number of large mastabas which were obviously in continuation of that cemetery or closely related to the persons buried in the mastabas of that cemetery.

The northern part (hereafter CEEN) was labeled by Reisner "Additions to cemetery en Echelon". It comprises tombs built in the time span between the late Fifth Dynasty and the First Intermediate Period clustering mainly around the *sndm-ib* complex². The total area of CEE is circa 42081 m².

Some of the tombs in CEE were already accessible in the 19th century as shows a painting of the Western Cemetery made by the Lepsius expedition in 1842³. Following the division of Giza excavations in 1902, the area of this cemetery fell under the American, German and Italian concessions. Part of the necropolis was investigated briefly by Ernesto Schiaparelli between 1902 and 1905⁴ before the Italian concession was given up and assigned to Reisner. In 1908 and during the Ernst von Sieglin expedition, Georg Steindorff discovered the tomb of *sšm-nfr* III (G 5170) by chance. Shortly after and between years 1912 and 1926 Hermann Junker carried out excavations in the northern section of CEES publishing his results later in four Giza volumes⁵. George Reisner excavated the entire CEEN and the southernmost section

¹ PM III, 83-95; 141-168.

² Published in BROVARSKI, *Giza* VII.

³ *Lepsius- The German Nile Expedition, Berlin*, Staatliche Museen zu Berlin, Stiftung Preussischer Kulturbesitz, 2006, plate on p. 48.

⁴ The results were published much later: CURTO, *El-Ghiza*.

⁵ JUNKER, *Giza*, volumes II, III, VII, VIII.

of CEES between years 1911 and 1916⁶. Reisner's work is still kept unpublished in the archives of the Museum of Fine Arts Boston⁷, but was made recently available to the public through the Giza Archive project⁸ including valuable and in many parts still unprocessed data which are crucial for the history of this part of the necropolis.

3- The Geodatabase

The 20 available maps executed by five of the Giza cemetery excavators (Junker, Reisner, Abu Bakr, Hassan and Petrie) were geographically referenced and a topographical map of Giza (1: 5000, 1977) was used as a base to attach these maps. Together these maps form the complete landscape of the Giza plateau including the Eastern Cemetery, the Western Cemetery, the Central Field, the South Field and the Menkuare Quarry Cemetery (map 0.1). The elevation lines were added to the map using another topographical map providing elevation lines at 10 m intervals.

The Geodatabase was built with ArcGis software version 9.3. It consists of 2382 tombs, of which 427 are located in CEE (map 0.2). For the tombs of CEE other information about each tomb were added including the owner name, mastaba type, mastaba material, whether the mastaba has identifiable borders, whether the tomb has a superstructure, the presence and quality of decoration, the number of shafts, the number of serdabs, titles of the owner divided to categories and the grave goods recorded according to type and material. Chapels, serdabs and shafts were represented by one feature class in order to calculate the effort expenditure of each tomb later. Information of serdabs and chapels included area and type while data of shafts included the volume, type and material of lining of the shaft in addition to the details of the substructure of the tomb like the type, volume and orientation of the burial chamber, volume of canopic pit, volume of passage, type of blocking, whether there was evidence of a burial in the tomb, whether the tomb was plundered, open or found empty. The database included another table which comprises the family and dependents of the tomb owners and their titles, and whether they were attested elsewhere in the Giza necropolis. The use, reuse

⁶ REISNER, *Giza I*

⁷ The unpublished manuscripts of Reisner for this cemetery include four chapters: Cemetery G 4200, Cemetery En echelon, Additions to cemetery En echelon, and the *sndm-ib* complex. Other details of coffin types, canopic vessels, pottery, flint, wooden objects, food offerings, containers, statues and serdabs, mastabas marks and mastabas dating are included in the unpublished chapters of Giza II, 9-15.

⁸ Background about the project: MANUELIAN, *Egyptian Archaeology* 28 31-33; MANUELIAN, *KMT* 16, 68-80; MANUELIAN, *Sokar 10*, 10-17. Internet site for Giza Archive is (as till December 2009): www.gizapyramids.org.

and abuse of mastabas were very difficult to document as they have diverse archaeological evidence, but intrusive shafts were differentiated from the original ones when possible.

4- Problems in Analysis

It is important to note at an early stage of the current study that there are serious limitations to a GIS based study for the CEE. These fall into the following classes:

4.1 Data error

It is perhaps to be considered a rule that all collected data in general have a degree of inaccuracy, arising from human and instrument errors⁹. In studies similar to the current one, where data recording methods are automated, the risk of undetected error increases¹⁰.

Another serious problem for this type of research is the incompleteness of data. Though such a problem occurs not rarely concerning the types and dimensions of features in CEE, the material accumulated for the current study was sufficiently large to compensate the missing data and to allow some conclusions. Incidentally our conclusions were in line with the results of more in depth studies dealing with the Old Kingdom cemeteries.

4.2 Dating

The need for a uniform and well structured representation of chronology was essential in the present research since many ArcGis operations would not have been otherwise possible. While the arguments of dating for single tombs as presented by different scholars were analysed and discounted, it was realised that such an approach cannot provide an input for the ArcGis software. For the last named purpose, the outcome of a seriation attempt was utilised in spite of the realization that the results presented by the mentioned attempt were not to be taken at face value.

4.4 Disturbed shafts and re-distribution of objects

Our Analysis of economic variations as reflected in tomb wealth was complicated by the fact that the intact shafts were only an exception in CEE. Because most shafts were found plundered or disturbed, very little conclusions could be derived from the distribution patterns of grave goods.

⁹ These are few studies which attempt to document the seriousness of this statistical problem: Hampel et al. (*Robust statistics*, 10) suggested that as a matter of routine between 1% to 10% of values will contain gross errors.

¹⁰ HAINING, *Spatial data analysis*, 14.

The question of movement of objects from rich tombs to poor ones formed an obstacle as well. Not rarely was a costly object dismantled and reused for blocking a shallow poor shaft. Sophisticated burial equipment such as offering tables and statues found their way often to less wealthy tombs. Occasionally, some of such objects were easily identifiable and were thus excluded during the analysis.

4.5 Gender and age

Two important factors which are usually used in analysing the complex social interactions in a cemetery are the gender and the age of the cemetery's occupants¹¹. The archaeological records of CEE attest however only occasionally the gender and age of the human remains discovered during excavations. Even in the few documented cases, such records tend to express age in general terms: Old, middle aged, young, child...etc. For these reasons no analysis concerning the age and gender of burials could be carried out within the current study.

4.6 Areas with no numbering

The Google Earth aerial photo for the Giza plateau shows areas which are not represented on the accessible maps for the Giza cemetery. The areas listed below are occupied with tombs with no numbers or bibliographical data. Such areas were drawn in our maps for the Giza cemetery as accurate as possible directly after the Google earth aerial photo in each case:

WCE

A large area to the west of Junker cemetery¹² (west part of Mittelfeld)

An area between cemetery G 3000 and west part of Abu Bakr cemetery¹³

An area between cemetery 1100 and east part of Abu Bakr cemetery¹⁴

An area to the northwest of the west part of Abu Bakr cemetery

ECE

An area to the northwest of G 7820

Central field

An area to the north of LG 100 including some tombs scattered in the center of the middle field

¹¹ MESKEL, *Archaeologies of social life*, 136 ff.

¹² The tombs represented by PM plan XIII (2) and published in JUNKER, *Giza V*.

¹³ The plan of the later tombs is in Abu Bakr, *Excavations (1949-1950)*, map at end.

¹⁴ The plan of the later tombs is in Abu Bakr, *Excavations (1949-1950)*, map at end.

In addition to those unnumbered tombs, others have numbers but no accurate location on the map. An example for the last mentioned case are the tombs of Menkaure quarry cemetery, many of which don't seem to be numbered by Reisner. Those tombs had been sanded up according to PM¹⁵. Though some of them are visible today, it is still hard to fit the plan of Reisner with the present scene of the area.

Another difficult area is that of the south field which includes rock cut tombs and many small brick mastabas. The only available map was made by Petrie¹⁶ who described the location of those tombs as being in the southern part of the south field facing east and overlooking the cultivated land. On the map of Google Earth there are some traces for tombs in that area, but again fitting the plan of Petrie to the aerial photo is no easy task.

¹⁵ PM III, 228.

¹⁶ PETRIE, *Gizeh and Rifeh*, Plan VII C.

Chapter One
A Spatial Study of the Giza Cemetery

One of the important questions related to territory in the high density cemeteries like Giza, is the degree of involvement of state organization versus personal preference in determining the location of tombs and their sizes. Were individuals directed only by space and wealth considerations or have there been sumptuary laws¹ which were imposed by the state to regulate space occupation? Were there other limitations, like family, service of older tombs and one's occupation, which played a role in forming the clusters of tombs?

Egyptologists now realize that such matters require sustained and systematic examination. Without statistically based research many of the assertions made about the territorial policy in Old Kingdom cemeteries will remain unsubstantiated or incorrect. This research adopts a spatial approach, the central idea of which is that power has spatial correlates, for it is the essence of power relationships that they are asymmetrical. It is the type and amount of this asymmetry which indicate the degree of centrality in a society.

Even though they are not themselves physical barriers intended to defend the territory, the Old Kingdom royal necropolises, with their huge pyramids and great stone mastabas, could have served as symbolical territorial markers of the society, thus having been the focal point of the territory and a symbolic center for the community. In most cases such features were doubtless used for burial; this was indeed their chief function in an utilitarian sense. But it is clearly not their chief significance, for there is absolutely no need to erect a great monument to solve the simple problem of disposal of the dead. In spite of the restricted access to such monuments, both in terms of criteria for burial within them and in the sense of their being taboo localities, they were clearly public monuments, designed to be seen. They were built by the elite of the community to be visible to the community, the question of visibility being thus no less important than their accessibility.

The relation of private tombs to royal tombs from the First Dynasty until the Fourth Dynasty in Saqqara, Maydum, Dahshur and Giza has been traced by Roth² who noticed that the distance between royal and private tombs decreased markedly in Giza, the novelty being not only the proximity to the royal tomb but also the dependence upon it. The great monuments of Giza cemetery were hence the leading buildings, a point around which other features clustered, both in terms of orientation and design, like a magnetic field.

¹ Sumptuary laws (from Latin *sumptuariae leges*) are laws which attempt to regulate habits of consumption. *Black's Law Dictionary* defines them as "Laws made for the purpose of restraining luxury or extravagance, particularly against inordinate expenditures in the matter of apparel, food, furniture....etc.

² ROTH, *JARCE* 30, 49.

1-Dating the main cores in Giza cemetery

As Roth already noted unless all the tombs in a cemetery can be dated, it is impossible to determine the shape of the cemetery at any given time during its development³. Dating the building phases in Giza cemetery is thus crucial, before spatial study can be carried out. It is only when a tentative dating of earlier phases of Giza cemetery is achieved, that the spatial patterning of main cores in Giza can be investigated in different periods of time. Since each of the two main excavators of Giza, Reisner and Junker, had their own vision of the relative dating of the cemetery, they produced two different time frames for the earliest cores. In the case of the WCE in particular we are faced with a cemetery that formed a unit in its ancient composition, but was divided in modern times by two very different archaeological missions, causing difficulties, not only in regard to dating, but also relating to terminology and topographical classification of features. Below is a summary of the dating of Reisner⁴, comparing it to the opinion of Junker⁵ concerning the same tombs, and amending it when necessary.

According to Reisner⁶ the scene of tombs in the Giza cemetery at the end of the Fourth Dynasty was the following:

1-A The Western Cemetery

Reisner assumed that the three nucleus cemeteries of the WCE had been begun nearly simultaneously for three different groups of the encourage of Khufu, each based on a blood relationship. Each of the three western cemeteries was begun with an initial group of five cores laid out by the 5th year of the reign of Khufu. The initial 5 cores in each nucleus cemetery were either of type II a or II b which Reisner believed to be the earliest types. The WCE grew from west to east, the earliest tombs being apparently built on the most topographically favorable pieces of land. Reisner thought that it was due to this reason that a space between the earliest tombs of the cemetery and the pyramid of Khufu was created, while Junker believed that the space was left deliberately unoccupied by the early Fourth Dynasty administrators of the cemetery out of respect for the great royal building.

1-A-1: Cemetery G 1200

Reisner thought that cemetery G 1200 is earlier than the two other cemeteries (G 4000 and G 2100). The reason behind this building direction might be the fact that the area to the east of

³ ROTH, *Giza VI*, 49.

⁴ Summerised by REINSER, *Giza I*, 13-15.

⁵ Summerised by JUNKER, *Giza I*, 10-14.

⁶ REISNER, *Giza I*, 73-84; REISNER, *Chapter 15*, passim.

this cemetery was still occupied by building materials of the great pyramid complex. All the original cores of the cemetery are of type II a, and nine are of the normal size of the Western Field. Excluding the additions and the casing of the mastabas, which are obviously later in date than the creation of the cores, we are faced by 9 cores of uniform size arranged in parallel streets with regular separating spaces. The types of those cores and the burial-shafts are so uniform that Reisner concluded they were all carried out by a working-gang of Khufu. One of the lining blocks of the chamber of G 1205 actually bore the name of a working gang of Khufu. The building stages according to Reisner are the following:

1-Five initial cores were built. It is uncertain whether the large core G 1201 has been the first in this cemetery, and thus the first in the whole western field, or whether the cemetery has been initiated by another 4 cores, two in the middle row (G 1223, G 1225) and two in the southern row (G 1203, G 1205). Reisner gave however more merit to the possibility that the large mastaba (G 1201) was constructed after the initial rectangle formed by the mastabas at the eastern end of the south and middle rows. The casing of three cores (G 1201, G 1223 and G 1225) was left unfinished after it had been begun as Y- casing on each of the 4 sides. Reisner took this cessation of work as a mark for the end of the reign of Khufu and the accession of Djedefre.

2-Five other cores joined before by the 15th year of the reign of Khufu (G 1207, G 1227, G 1233, G 1235, G 1209). The total number of mastabas in this cemetery at the death of Khufu was 10.

Following the conception of Reisner, one can notice that the development of this cemetery extended from east to west, a unique feature which was not repeated in the other nucleus cemeteries. The reasons according to which Reisner divided the tombs of G 1200 into two groups for dating are unknown. Obviously those two groups do not accommodate tombs according to their sizes, nor their architectural features, nor the titles of their owners.

Junker referred to cemetery G 1200 by the *Nordwestfriedhof* and believed it to be the oldest part of the WCE dating its construction to the reign of king Khufu on the base of the name of the king found in G 1207.

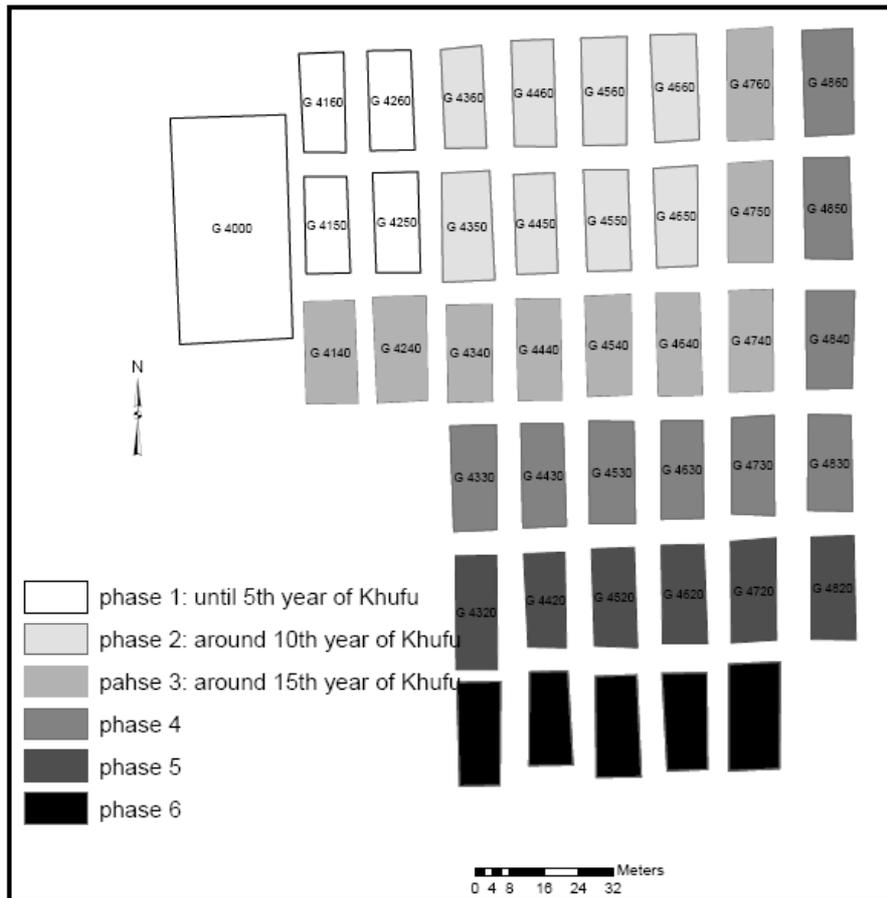
1-A-2: Cemetery G 4000

Reisner believed that all the 42 cores of this cemetery were built by the public works department of Khufu in different phases during his reign. The order of their construction is the following:

- 1- During the first 5 years of the reign of Khufu, four initial cores at the western end of the 2 northern rows were built (G 4160, G 4260, G 4150, G 4250) and the large core G 4000 was laid out to the west of these 4 outside the unified plan. Reisner was not certain whether the core G 4000 was built before or after the 4 initial cores but he believed that this group was the earliest in the cemetery because all of those cores are of type II b⁷ which he considered an early type. In addition to that all the 5 cores had stone lined chambers of type I, a type which had been introduced in the private tombs in Maidum.
- 2- The two E-W rows established by the original blocks of four cores of type II b were continued eastward by the addition of four cores in row 6 (the northern row) and four in row 5 (the second from the north). This happened around year 10 of Khufu.
- 3- Row 4 was begun south of the western line of the original block and carried eastwards to line 7. G 4750 and G 4760 were added at about year 15 of Khufu. .
- 4- The third addition consisted of row 3 (G 4330-4830) and line 8 north of G 4830 (G 4840-4860).
- 5- The addition of row 2 which consisted of six mastabas (G 4320-4820).
- 6- The addition of row 1 which consisted of 5 mastabas (G 4310-4710).

The compilation and occupation of those cores lasted from the reign of Khufu to that of Userkaf.

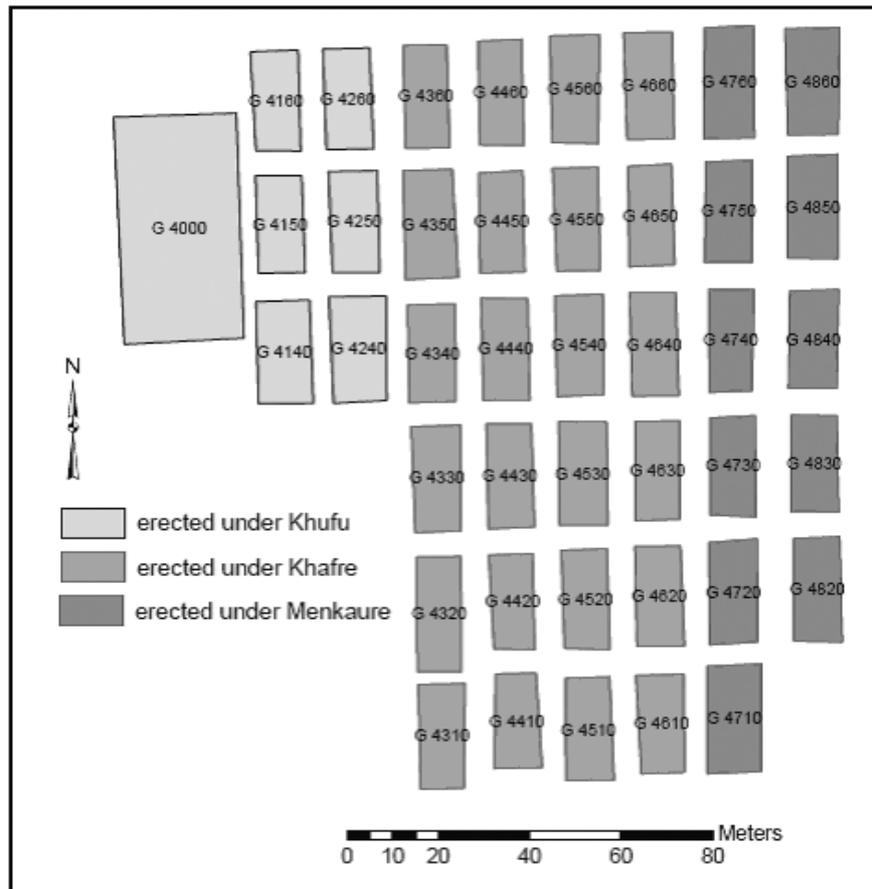
⁷ Reisner mentioned that all the 5 cores of the first phase are of type II b, but recorded G 4260 as type II a, perhaps by mistake. REISNER, *Giza I*, 454, 456.



Building stages at G 4000 according to Reisner

Junker called cemetery G 4000 the *Südfreidhof*. He subdivided this cemetery into two groups according to the building material:

- A- The tomb of *ḥm-iwnw* and the first two rows, which are built of small blocks of good quality stone. Junker believed this group to be the elder one because of the name of Khufu which was found in the tomb of *ḥm-iwnw*.
- B- The rest of the tombs, which used larger blocks of lesser quality, can in turn be subdivided to 2 groups:
 - 1- The rows 3-6 which used dark hard regular stones, and whose streets were wider. Junker dated this building phase to the reign of king Khafre because his name was found in G 4340.



Building stages at G 4000 according to Junker

- 2- The rows 7-8 which used nummilitic stones and had no casing or reserve heads. This group is clearly later than the first. Since the first group dates to Khafre, this second should date to Menkaure. The tombs of GIS cemetery provide a confirmation for this date, because its tombs are similar to the second group and they had many occurrences of the name of king Menkaure.

Janosi⁸ discussed the building stages of both excavators and opted for the dating of Reisner because of the uniform plan of the cemetery which indicates that it was executed under the government of a single king.

1-A-3: Cemetery G 2100

Reisner divided the major tombs in this cemetery into two sections, an earlier western half , and a later eastern half. Each section contains two north–south rows of mastabas, the regularity of whose layout increases as one moves from west to east. These mastabas were finished and occupied in a period between the reigns of Khufu and the beginning of the Fifth Dynasty.

⁸ JANOSI, *Giza*, 142.

1-The western half includes the first five cores (G 2100, G 2130, G 2120, G 2110, G 2210) which Reisner dated to around the 5th year of the reign of Khufu. Five primary burial shafts of the western half had portcullis grooves, which are attested from the earlier necropolises, especially in Dahshur and Maidum but nowhere else in Giza, linking architects and craftsmen who built these tombs to those who served under Snefru. Those cores were obviously not built on an unified plan because they are not aligned in the E-W direction. The arrangement of these early tombs follows almost the En Echelon principle⁹. Reisner believed that these tombs formed a family group which was concentrated around G 2100.

2- Six more cores joined in the eastern half before the 15th year of the reign of Khufu (G 2135, G 2140, G 2150, G 2155, G 2160, G 2170). The total number of cores at the end of the reign of Khufu was 11. At the point of the death of Khufu, the casing work of G 2155 was interrupted. The eastern group gave the cemetery its appearance of an almost unified plan.

All cores of this cemetery are of type II a except G 2130 which is of type II b. According to the chronology of Reisner , both types were approximately contemporaneous. Tombs of cemetery G 2100 exhibit much more variability in their architectural types than those of cemetery G 1200. In addition to the portcullis grooves in the shafts, the 5 mastabas of the western group show few other similar architectural features. Four of the burial chambers (G 2100, G 2120, G 2130, G 2210) are lined with stone. Two of the cores (G 2130, G 2210) were enlarged by an addition on the north while the others remained without extensions. Most of the chapels are destroyed but it is possible to know that exterior c.b. chapels of type I a were added to two cores (G 2120, G 2100), that exterior chapels of type (2 b) were added to two cores (G 2110, G 2120), and that interior chapels of type 3 a were added to two cores (G 2130, G 2210). Types of casings of cores are variable (x masonry, y- masonry, uncased).

The six mastabas of the eastern half are almost uniform in their original sizes but variations in their finishing are several as well. Four of them are uncased, two are cased with Z and mixed masonry. Interior two-niched chapels of type 4 a were added to two mastabas (G 2150 and G 2155). The eastern group makes a rather less wealthy impression than the western: the sizes of cores and burial chambers are smaller, and 5 of the burial chambers are of the less expensive unlined type.

The building of cemetery G 2100 in two groups created streets and avenues of different widths. The spaces in the western group were comparatively small and occupied by a few very small mastabas later. The spaces in the streets and avenues of the eastern group were larger and filled with complexes of small and medium-sized secondary mastabas.

⁹ JANOSI, *Giza*, 149.

Junker, who termed this cemetery the *Nordfriedhof*, found the 4 cores (G 2110, G 2100, G 2130 and G 2120) similar to those of the *Nordwestfriedhof* (cemetery G 1200) and dated them to the reign of king Khufu. According to his opinion the remaining cores were constructed in the reign of Menkaure and were finally connected to the *Südfriedhof* (cemetery G 4000) with the two mastabas G 2155 and G 2160 which were also added in the reign of Menkaure. Manuelian¹⁰ examined the conclusion of Reisner concerning the dating of the western and eastern halves and supported it. The building graffiti in this cemetery give two dates. A red-painted graffito, which was discovered on the face of a casing block in G 2120, reads, *rnpt-sp* 12. Assuming the biennial cattle count was still in effect in the early Fourth Dynasty, this would indicate year 23 of Khufu. A second graffito, found on a casing block in G 2130, reads: *h3t-sp* 4(?). unfortunately both dates were recovered from later additions to the mastabas and they indicate thus nothing concerning the date of the core's construction. A fragmentary seal with the letter w, referring perhaps to king Khufu, was found in the burial chamber of the same tomb.



Building stages at G 2100 according to Junker

1-A-4: G 2000

¹⁰ MANUELIAN, *OKAA* 2006, 221-230.

Reisner believed that G 2000 was finished long after the construction of the five initial cores in cemeteries G 1200, G 2100 and G 4000 and after the twelve original cores of the ECE because the uneven and bad character of the rock-surface under G 2000 proves that in selecting the site the builders had no other choice since the better sites of cemeteries G 4000 and G 1200 had been already occupied. This conclusion is strengthened by the fact that none of the nucleus cemeteries is in alignment with the great mastaba G 2000. G 2000 is associated in size with G 7510 and it resembles in material and construction G 7410-7420. This later mastaba is dated to about year 20 of Khufu. The time frame of its building is thus between the last two years of Khufu and the first five years of Khafre. For unknown reasons and in contrary to the other large mastabas of the cemetery, G 2000 did not form the core of a nucleus cemetery during the reign of Khufu.

1-A-5: Cemetery En Echelon

For a detailed dating for the Cemetery En Echelon, see below p. 95ff.

1-B The Eastern Cemetery

The ECE was begun by the construction of a subsidiary pyramid G Ix few meters east of G Ia but its construction was abandoned shortly after because at that time the tomb of Queen *ḥtp-ḥr.s* I, mother of Khufu, was made immediately north of the site¹¹. G I a was then built on its present site with a boat grave along its southern side. Practically at the same time the second small pyramid, G I-b, was built. After the construction of these two pyramids, perhaps even before they were quite finished, a third G I-c was added. G Ia and G Ib were built about the 15th year of Khufu before any of the mastabas of G 7000. By comparing the alignment of G Ic with the angle between the entrance hall and the boundary wall of the great court of Khufu's pyramid temple, Reisner concluded that G Ic was constructed a little later than the 15th year of Khufu. After the construction of G I-a and G I-b, but at no great interval of time, the twelve original cores in G 7000 were built after the middle of the reign of Khufu, probably about year 17. Reisner assumed thus that the work in the royal pyramid complex was simultaneous with the building of the secondary pyramids and the 12 mastabas. Those 12 original mastabas, which had been arranged in three rows, each with four cores, were altered later into eight twin mastabas consisting of two rows of four mastabas each. To achieve this architectural change the tumuli of the 2 first north rows were connected together to form twin mastabas. The third row was elongated by an extension towards the south. Reisner believed that the

¹¹ The hypothesis of the transfer of *ḥtp-ḥr.s* I's burial place from Dahshur to Giza, and the theory of a secret burial for her in Giza have been criticized by LEHNER, *Hetep-heres*,4-5.

change was completed by ca. years 20 to 23 of Khufu's reign¹². In the Eastern Field, the break made by the death of Khufu seems to have come at the mastaba G 7230-7240 the casing of which had been begun but was never finished while the next mastaba G 7330-7340 was never cased at all. Reisner has taken these mastabas on which the work was interrupted as marking the end of the reign of Khufu.

The starting point of Reisner in dating this cemetery was a graffito date at the upper end of the Khufu causeway near the entrance of the temple. It was read by Alan Rowe as: "Year 8, month 1 of *pwt*." Reisner¹³ seems to have been mistaken in thinking that Rowe read this date year 13 and Smith¹⁴ believed that the year would apparently be indicated by the eighth count, that is, Year 15. In G 7000 the evidence as to the presence of slab-stelae or recesses was destroyed by the reconstruction of the chapel recesses in the twelve original mastabas. All together, the number of mastabas built under Khufu in Giza is 72, in addition to the three subsidiary pyramids.

Reisner assigned the growth of this cemetery, by the addition of five massive cores (G 7510¹⁵, G 7650, G 7530-40, G 7450¹⁶, G 7350) around the SE corner, to the reign of Khafre, probably years 1-15. The En Echelon principle appears here in the finishing of the two massive cores G 7650 and G 7530-7540 and was continued by the mastabas added around those two cores. Reisner also believed that all the other mastabas built on lines laid down by the nucleus cemetery have been built during the late reign of Khafre including G 7050, G 7550, G 7660, G 7760, G 7750, G 7810¹⁷. The large size of mastaba G7510, comparable only with G 2000, and its alignment on the north and south with queens' pyramid GI-a and GI-b contradicts Reisner's theory that it was constructed after the eight twin mastabas during the reign of Khafre¹⁸. Janosi¹⁹ therefore believes that G 7510 belongs to the first building of the ECE and was the first mastaba built in that field even before the original 12 mastaba cores. By position and construction, the next addition to the ECE was carried out in the reign of Menkaure and included G 7820, G 7060, G 7070, G 7560, G 7670, G 7133, G 7422, the secondary tombs G 7133, G 7422, G 7441, and the rock cut tombs at the edge of the cliff: service number 1, service number 6.

¹² G 7130-7140 was completed about year 23 of Khufu because of a quarry mark on the casing which reads year 23 (*h3t-sp* 12.)

¹³ REISNER, *Giza* I, 71.

¹⁴ SMITH, *JNES* 11, no. 2 April 1952, 127.

¹⁵ Reisner calls this mastaba by mistake G 7150 in *Giza* I, 84.

¹⁶ I think Reisner calls this mastaba by mistake G 7540 in *Giza* I, 73.

¹⁷ REISNER, *Chapter* 15, 43.

¹⁸ FLENTYE, *OKAA* 2006, 135.

¹⁹ JANOSI, *Giza*, 92.

1- C Cemetery GIS

Reisner felt that the cemetery G I S is a continuation of cemetery G 7000 and that it was begun at the eastern end. He also concluded that the construction of the eastern group of six cores (cores 5-10) was begun before the casing of No. 6 in the years 2-4 of Menkaure, assigning those cores eventually to the end of the reign of Khafre²⁰. Junker on the other hand dated the whole row of ten cores to the reign of Menkaure causing. Reisner did not reject this possibility but felt puzzled as to why Menkaure would select a place so far from his own pyramid to start a new cemetery. An eleventh core, G X S, was left unexcavated by Junker and was later examined by Zahi Hawas²¹. Since it is located in the eastern group of mastabas, it should be assigned the same date.

1- D Central field

In the reign of Menkaure rock tombs began to be cut in the old Khufu-Khafre quarry including those built for the sons of Khafre : LG 88, LG 87, LG 89, LG 90, LG 92, LG 86²², *ḥnh-m^c-r^c*, *ḥmt-r^c*, LG 12, LG 89-X, *iwn-r^c*, *rht-r^c*. Janosi on the other hand believes that such tombs must have been begun in the last third of the reign of Khafre²³.

1-E A tentative relative dating for the main cores in Giza cemetery

Dating the building phases in Giza cemetery is crucial before any spatial study can be carried out. It is only when a tentative dating of earlier phases of Giza cemetery is achieved, that the spatial patterning of main cores in Giza can be investigated in different periods of time. The chronology widely accepted between scholars now for Giza is that of Reisner. As a researcher approaching Giza cemetery, with no previous knowledge or prejudgments, Reisner had to use a series of primary observations and hypothesis in dating the early stages of the western and eastern cemeteries. To be able to put the dating of Reisner for the cemetery into criticism, one should attempt to reproduce the mental process which led to his conclusions.

In viewing the layout of the WCE, the largest mastabas (G 1201, G 4000) attracted the attention of the viewer by the virtue of their size. It was possible then to recognise that in the vicinity of those 2 large cores other mastabas were arranged in an almost regular manner. Perhaps because the two eastern lines of G 2100 look like an extension of the same lines of G 4000, cemetery G 2100 was also a subject of thoughtful consideration. Reisner could not ignore as well G 2000 as an early mastaba, because of its huge measurements, although no

²⁰ Although he found it also possible that they were built in the early reign of Menkaure.

²¹ HAWASS, 'Satellite Pyramid of Khufu', 380, fig. 1. JANOSI, *Giza*, 254, 263-264, fig. 56.

²² Reisner dated LG 92 and LG 86 to late Menkaure or Shepseskaef

²³ JANOSI, *Giza*, 305.

other mastabas are arranged regularly around it. These 3 groups of mastabas were considered nucleus cemeteries and the earliest in the necropolis (along with G 2000). Because the size and regularity of the 8 mastabas in G 7000 were suggestive, they were considered the main part of the initial plan for ECE .

It was then that Reisner formed his theory of family based nucleus cemeteries to justify the clustering of tombs to the west and east of the pyramid. Since slab stelae and reserve heads are present in 3 nucleus cemeteries of the western field, Reisner believed that the WCE was initiated earlier than the eastern, although he proposed the possibility that the slab stela in the 12 original cores of the ECE might have been obscured by the later additions. Reisner took then the types of those cores in the nucleus cemeteries as early types. He would later use those types to favour an early date of cores, leading sometimes to circular discussions. To assign building date to each cemetery , Reisner depended on graffiti dates which are not reliable since they are in most cases added on the casing blocks or on later additions.

Although the finishing of cores and their occupation expanded over a long period of time, Reisner accommodated the features found in finished mastabas (like casing, chapels, shafts and chambers) in an early phase in his topographical development. In some cases he rightly correlated those types to earlier features found at Dahshur and Maidum to support their early date. However in many cases there was no justification of attributing early relative dates for certain types apart from their existence in mastabas which Reisner initially considered early, leading again to circular arguments.

1-E-1 Dating the creation of cores by seriation

To free oneself from the above mentioned assumptions made by the original excavators of the cemetery, the original cores of the nucleus cemeteries should rather be classified topographically according to their features.

A seriation software was utilized to classify the cores into groups according to their topographical variations. An attempt to enter types of all features as an input had little success (seriation graph 1.1). It became clear that many building phases intersect with each other in each tomb. Since some architectural elements like chapels, shafts, burial chambers and casing were in most cases added to the cores much later, their typology does not assist in detecting the dates of erection of the cores. A less sophisticated classification using the very basic characteristics of cores was needed. There are in fact only 3 features which are associated with the creation of cores: the size, position and type of the core. To those can be added the original shaft number of the core and whether it has slab stela or/ and portcullis grooves. Size of cores was entered in four categories: small, middle , large and huge. The presence of slab

stelae was used as an input because slab stelae are usually interpreted chronologically as an indicator of an earlier date. Portcullis grooves were included as a seriation input because they were used by Reisner to relate the cores of the 2 western lines of G 2100 to each other within his argument in favour of an early date for those cores. As the aim of this process was to explore the earliest stage of the spatial cemetery development, when unoccupied spaces of land were still being assigned to tombs and individuals, the 8 twin mastabas of cemetery G 7000 were entered as 12 cores of type IV I, each with a single shaft.

Examination of results (seriation graph 1.2) confirms many of the basic remarks of Reisner about the cemetery, yet puts others into question. Though no special weights were given to location, cores of the same cemetery cluster successively on the seriation graph, with only few exceptions. It is possible to classify cores based on their shared features into three groups:

1-G 1200, G 2100

2-G 4000, CEE

3-GIS, G 7000

A scenario of building sequences can be reconstructed following this classification combined with other facts known about the cemetery. Since both cemeteries G 1200 and G 2100 contain the earliest building graffiti of Giza (the 5th and 4th counts successively), it is reasonable to assume that they were the first to be constructed in the WCE. Cemetery G 1200 might have been initiated before cemetery G 2100 because it has more occurrences of slab stelae and reserve heads. It could be noticed that the 5 tombs of the eastern group of G 1200 succeeded each other on the seriation chart, with G 1201 as the first mastaba. The assumption of Reisner that the eastern group of cemetery G 1200 is earlier than the western might thus be true. The more reasonable and direct classification of cores would however exclude G 1201 from the eastern group for its striking larger size. The lines of the cemetery support this suggestion as well. The southern border of the 9 cores is an extension of the line running from the northern border of Khufu's pyramid. If G 1201 had been earlier than the creation of the 9 cores, it would be hard to justify why the architects returned to the lines of the pyramid after ignoring it their initial building. Assuming that G 1201 is later than the 9 cores, would provide a better explanation. The owner of the mastaba should have wanted to build a larger mastaba than the other cores, maybe because he was the first royal occupant of this group. Since he could not commit his building with the streets of the cemetery and the lines of Khufu pyramid at the same time, he preferred the first choice.

To set the dates within the reign of Khufu when any buildings in this cemetery were initiated or finished would be a matter of speculations and the dates which Reisner assigned to the creation of the cores in the eastern and western groups, 5th and 15th year correspondingly, do not have any

evidence. The only graffito date available in this cemetery is the *rnpt-sp 5* in G 1203 corresponding perhaps to the 9th year of Khufu .

Only after changes and casing are added to tombs do we notice a clear categorization. The three royal tombs in particular (G 1201, G 1223 and G 1225) show many common features. They were all enlarged by the addition of core-work of type IV iii and two of them had an annex with one shaft on the north. Their chapels had been originally of type 1 a and were later subjected to the same alternations to accommodate an interior offering-room of type 3 a and an exterior c.b. chapel. These alternations and enlargements may justify the belief of Reisner that the owners of these tombs won more favor under king Khufu after their cores had been created, though they may also suggest that those cores were assigned to royal owners only after their creation. There seems to be no great interval of time between the creation of the superstructure and substructure of these cores because the burial chambers are all the lined stone type.

The tombs of non-royal or unknown owners show a high degree of similarity to each other as well. All of the 7 cores are uncased and have an exterior c.b. chapel of type (I a).

Only eight out of the ten mastabas have known owners. According to Reisner the occupants of this cemetery represent a family group. Since none of the known owners or their dependants are mentioned in each others tombs, the genealogical bond between them is very unlikely. On the other hand, the theory of Helck regarding the attribution of nucleus cemeteries to officials connected to royal construction is no more valid for this cemetery. Out of the known eight owners, only *k3-m-ḥ* (G 1223), had a title that is directly connected with the building works²⁴.

Few conclusions about the development of this cemetery can be drawn from basic facts. G 1200 was planned on uniform base. It was meant to include three east west rows, each containing 4 or more tombs. The construction began from east to west at the three rows. Though the desire of the builders was most probably to construct their buildings as close as possible to the pyramid, they had to extend the cemetery from east to west because of the lack of space on the eastern border. The building activities were later stopped at different stages in each row because the interest of builders was directed to other locations of the cemetery as pieces of land closer to the pyramid became cleared. This is perhaps the reason why the southernmost row has 4 mastabas, the middle 3 and the northern only 2. Shortly before ceasing of construction and only when the central planning for this cemetery began to fade was the owner of G 1201 able to layout his tomb outside the uniform plan. G 1201 was built

²⁴ HELCK (ZÄS 8, 63-4) tried to impose his argument by claiming that *wp-m-nfrt* (G 1201) is connected with building activities only because of his title *ḥd-mr* which is carried also by *rḥ-ḥtp* and *mr-ib*. Moreover, the title *hrp- tm3* (G 1203) of *k3-nfr* can equally mean a director of soldiers.

by a royal occupant, *wp-m-nfrt*, who obviously wanted to stress his privileges more than the other owners by the huge size of his mastaba. The first nine cores were meant to be uniform, and they most probably stayed so until the construction of G 1201. Since G 1223 and G 1225 were also assigned to members of the royal family, they both added an enlargement on the east and an annex on the north, most probably to be in a better comparative position with G 1201. Though both alternations narrowed the adjoining east and north streets, the owners were permitted to break the layout of the cemetery by virtue of their royal connections. G 1228 and G 1233 were also allowed to add an annex to the north side but only because in both cases there were no adjoining mastabas from the north side, and no narrowing of streets resulted.

G 2100 was built shortly after G 1200. Features like the slab stela and reserve heads which are characteristic for the early reign of Khufu appear in five tombs of this cemetery (G 2100, G 2110²⁵, G 2135, G 2120, G 2155). The cores of the two western lines relate to the cores of G 4000 more than to those of G 1200 on the seriation graph. This indicates perhaps that, contrary to the current belief, cemetery G 2100 was begun by the three eastern rows which were built following regular lines. Two vague points concerning the dating of Reisner are worthy of mentioning. Reisner based his classification of the tombs into two groups mainly on the presence of portcullis grooves in their shafts, though he recognized the fact that finishing the substructure was later than the creation of cores. It would be tempting then to wonder about the reason why both Reisner and Junker considered the western group of cores earlier than the eastern. Again the dates which Reisner attributes to each group, the 5th and 15th years, are unjustifiable.

G 4000 was initiated after G 2100. The construction started with the three northern lines, probably in the direction west east in accordance with the belief of Reisner. Reisner claimed that the principles which he followed in classifying the cores of G 4000 into his 6 building phases are their positions in reference to the initial four cores and the occurrence of the slab-stelae. It is true that the cores of the first three building phases had more slab stela than the later phases but depending on this point alone would not result in a classification of tombs into the 6 categories of Reisner or the three categories of Junker, nor would comparing the original architectural features of the cores and the alternations added to them justify such well defined building phases. With exception of building phase one, the core type IV I was the prominent type in all building phases. The first three building phases had all lined chambers of type I or 2 and the last three building phases had all unlined chambers of type 4 or 6. The only possible recognition of building phases would then be placing them into two categories:

²⁵ According to MANUELIAN, *Slab stela*, 161-162.

building phase one represented by three northern rows and building phase two represented by the three southern rows.

Before G 4000 was completed, the construction of CEE was in process. G 5110 was constructed after the third line of CEE, removing perhaps the last two cores of that line. The placement of the cores of CEE between those of G 4000 and G 7000 would support the suggestion of Janosi²⁶ who proposed that this cemetery was a part of the huge building project initiated by Khufu, but left unfinished and unassigned to particular individuals at his death.

The construction of the 4 cemeteries (G 1200, G 2100, G 4000, CEE) left a large space in the center of the WCE. That space might have been left deliberately because G 2000 which was constructed later was planned to be the leading mastaba in a nucleus cemetery as well. Since G 2000 was the last to be erected in the WCE, the interest of building shifting later to the ECE and cemetery G I S, no such nucleus cemetery was created around G 2000.

G 7000 and G I S are chronologically related, but their relative dating to each other is a bit problematic. The 10 tombs of cemetery GIS were assigned to two groups in relation to the cores of G 7000

The group G I S, G III S, G X S, G II S, G VI S and II of Junker.

The group GIX, GVS, GIIS and GIVS

The first group was correlated with the cores of G 4000 and the original 12 cores of G 7000, while the second group was correlated to the original 12 cores of G 7000 as well, but also to the later cores of the eastern field which are known by their position to be later than the 12 cores.

It could be concluded thus that at least some of the cores of G I S were built under Khufu, a possibility which Reisner already proposed²⁷, but contrary to his opinion it seems that the western group of cores is earlier than the eastern and that some of its cores were laid out even before the erection of any core in the ECE. It is generally agreed that the initiation of cemetery G I S could have started only after the removal of the building ramp to the south of the pyramid. This condition would push the building of the G I S and the ECE to rather late dates in the reign of Khufu. Based on iconographic criteria, the early date of the creation of G I S cores agrees with the opinion of Cherpion²⁸ who has suggested that the decoration of the tomb of *hwfw-dd.f* (GIIS) can not date to a later period than Djedefre.

According to the belief of Reisner, the ECE was initiated by the 12 original cores, just after the two queens pyramids GI a and G I b were built. According to their types, however, the

²⁶ JANOSI, *OKAA* 2006, 183.

²⁷ REISNER, *Giza I*, 74.

²⁸ CHERPION, *Mastabas*, 187.

two cores G 7510 and G 7650 are placed before the 12 original cores, and the lines of the cemetery may also suggest that both tombs were built earlier. It has been already proposed that G 7510 was built before any of the original 12 cores in the ECE because its southern border is aligned with that of GI b. Janosi noticed as well the decreasing space between the mastaba rows G 7110-7120 to G 7410-7420. The building space seems thus to have become limited as building headed to the east which supports the theory that the construction of these mastabas began from west to east while G 7510 was already standing. The decreasing width of the mastabas in the direction west to east²⁹ and the stylistic comparison of inscriptions and decoration support the same conclusion. Strudwick³⁰ noticed that chapel of *ḥnh-ḥ3.f* with two false doors dates the tomb to the reign of Khufu. He also drew attention that the offering list of *ḥtp-ḥrs*, the wife of *ḥnh-ḥ3.f*, is an old version which corresponds to the early date of the tomb. Flentye³¹ has moreover related the low relief decoration in G 7510 stylistically to the reliefs from mastaba G 4000 and the fragments from queen's pyramid GI b. The assignment of G 7510's reliefs to Khufu's reign would agree with the theory that the mastaba was constructed in the early phases of the ECE.

Following the same concept, it is possible to suggest that G 7650 was also built before the original 12 cores because its southern borders align well with the southern border of the cores of G I S cemetery. The graffiti in G 7650 (*ḥ3t-sp* 12 and *ḥ3t-sp* 13) which are usually attributed to the reign of Khafre can be equally placed in the reign of Khufu in particular because the name of Khufu was found in the mastaba³². Even if the graffiti dates to the reign of Khafre there is no reason not to consider an earlier date for the creation of the core, since long intervals of time often separated between the construction of the core and its finishing.

1-E-2 Dating and building graffiti

The mastabas of the six core cemeteries have 11 building graffiti, whose dates are usually attributed to a reign of a certain king based on the presence of his name in the mastaba. Some mastabas however do not have any occurrence of royal names, and the assignment of their dates is only based on their location. In both cases the attribution is tentative and subject to discussion. When such dates were given serial numbers and represented on the map (map 1.1), it could be noticed that the ECE has the later group of dates. Looking at the distribution of the graffiti dates in the WCE and ECE it becomes justifiable why Reisner believed that the building activities in the former began long before the later.

²⁹ Measuring the cores without the casing JANOSI, *Giza*, 444, table E.

³⁰ STRUDWICK, *Administration*, 77-78 (34).

³¹ FLENTYE, *ICE* 9, 730.

³² FLENTYE, *ICE* 9, 729.

mastaba	date	Name of kings mentioned in mastaba	Serial number
G 2130	<i>ḥ3t-sp 4</i>	Khufu	1
G 1203	<i>ḥ3t-sp 5, ibd ?.....sw</i>		2
G 4000	<i>ḥ3t-sp 8 and ḥ^ct-sp 10</i>		3
G 2120	<i>ḥ3t-sp 12</i>		4
G 7130-7140	<i>ḥ3t-sp 11 II Smw</i>	Khufu	5
G 7650	<i>ḥ3t-sp 12 II Smw 10</i> <i>ḥ3t-sp 13 IV</i>	Khufu	6
G 7450	<i>Rnpt sm3-t3wy 3</i>		7
G 7530-G7540 sub	<i>ḥ3t-sp 1</i>		8
G 7530-G7540	<i>ḥ3t-sp 2</i> <i>ḥ3t-sp 7</i>		9
G 7350	<i>ḥ3t-sp 10</i>	Khafre	10
G VI S	<i>ḥ3t-sp 2 II prt sw 22</i> <i>ḥ3t-sp 11</i>	Menkaure	11
G 5080	<i>ḥ3t-sp 2 II, prt sw 10</i>	Khufu, Shepseskaef	12

Reisner's tendency of attributing fixed dates to the initial nucleus cemeteries has however no justification. Janosi traced the arguments of Reisner in dating the 15 initial nucleus mastabas in the WCE to the fifth year of Khufu and did not find any evidence in its favour³³. The earliest building graffito in this cemetery is the *ḥ3t-sp 4* in G 2130 which would correspond to the 7th or 8th year³⁴ of Khufu. G 1203, which is one of the five initial cores of cemetery G 1200, carried a graffito with date *ḥ3t-sp 5*, which might refer to the 9th year of Khufu. The reasons why Reisner dated the initial mastabas in each cemetery to the 5th year of Khufu's reign are not known.

2- Lines of the cemetery at its early development

General lines governed the placement of cores within the nucleus cemeteries in WCE and ECE (map 1.2). A line runs from the south border of the funerary temple of Khufu to the north border of the fourth row of G 4000. The placement of the third row of cores to the north of that line suggests that its cores were built after the temple had been finished. It also proves

³³ JANOSI, *Giza*, 129-132.

³⁴ With a biennial count, while an annual count would not cause a discrepancy with the Reisner's dating.

that the three northern rows of G 4000 are the earliest of that cemetery. Since the upper part of the causeway of Khufu has a graffito date of the 8th count, the three northern rows of G 4000 must have been erected before that date. Another line runs from the northern border of the pyramid to the southern row of the cores of cemetery G 1200. . G 1201 does not align with that line on the south which supports the suggestion that it was built later than the other cores of the same cemetery. The same building direction was suggested by Reisner based on his dating for tombs according to their types. Some of the early cores in cemetery G 1100 (G 1221, 1101 and G 1020) showed the tendency of respecting the street lines of cemetery G 1200

A third line runs from the centre of the pyramid's west wall along the south wall of G 4000, although not exactly in perfect alignment with it. The south border of the WCE is formed by an east-west running wall of large nummulitic blocks, which most probably existed in the reign of Khufu though its dating is not determined with certainty³⁵. That wall aligns with the south side of the pyramid.

In the ECE it is clear that a street line runs from G Ia through G 7110-7120 to G 7410-7420 until the great mastaba G 7510, forming the northern border of the cemetery. Because this line runs straight, many scholars believed that the causeway of Khufu was planned originally to form a right angle with the funerary temple, but its orientation was altered later for unknown reasons. Another line runs from the southern border of the cult pyramid G Id passing by the queen's pyramid G Ib to the southern border of G 7510, again assuring that the later mastaba is a part of Khufu's plan for the ECE. On the south border of the queens' pyramids it is once more easy to notice a line which runs from G Ic to G 7430-7440 forming the northern border of the cemetery, although the line this time does not confine exactly with the border of G Ic.

3- Occupants of mastabas

It is widely assumed that the ECE is the royal cemetery while the WCE was planned for the officials. Examining the original tombs of the nucleus cemeteries may support this statement. Out of the 126 mastabas of the nucleus cemeteries, 29 have royal occupants, determined by their royal titles. Though it is tempting to associate some unattributed mastabas to members of the royal family by virtue of their size and position³⁶, those mastabas were not taken into consideration in our analysis, in order to avoid any presuppositions or circular arguments.

14 of the bearers of royal titles are in ECE, 13 in the WCE and only 1 in the GIS cemetery. It seems thus at first sight that royal tombs are almost equally distributed among the eastern and

³⁵ JANOSI, *Giza*, 114.

³⁶ those are G 2000, G 7310-7320, G 7230-7240, G 7430-7440.

western cemeteries. A more careful examination of royal tombs versus non royal tombs in each cemetery would however give a different view. About half of the total 24 cores in the ECE were attributed to bearers of royal titles, occupying about 35 % of the cemetery's area. The 12 royal tombs in the WCE on the other hand form only a small portion of the total 91 cores of the cemetery, occupying little more than 5% of the cemetery's area. The distribution of royal mastabas in each cemetery is also indicative (map 1.3). In the case of the ECE, the distribution of royal tombs has a clear orientation towards the royal complex, while non royal tombs tend to be placed at some distance from the complex. The WCE shows another distribution for both groups. Here the non royal tombs are the ones which are closer to the direction of the pyramid. The royal owners seem to have had no special privilege with regard to their vicinity to the royal complex. This arrangement of tombs coupled with the fact the members of the royal family in the WCE do not occupy the earliest tombs, might support the commonly accepted idea that the ECE was planned originally for the members of the royal family. It also suggests that the use of tombs in the western cemetery for royal persons came only as an afterthought. The date of occupation of cores by their royal owners in both cemeteries is hard to determine. Though four royal tombs have graffiti dates ranging from *h3t-sp* 1 to *h3t-sp* 11, the attribution of those dates to a certain king is often based on the relative position of tombs, not on a solid evidence. It is only in the case of G 2130 that the graffiti date of *h3t-sp* 4 is coupled with the presence of a sealing of king Khufu, enabling us to attribute the date, albeit with some doubt, to the reign of the king. Nevertheless, the presence of no names of later kings in royal tombs, with the exception of one case³⁷, suggests that most of the royal tombs have been occupied by their royal owners within the reign of Khufu or shortly after. Investigating the relationship between the location of those tombs and their sizes by the Moran's I index (map 1.4), demonstrated that tombs tend to cluster according to their sizes, those of smaller size obviously to the west of the pyramid.

4- Principles of allocation of tombs in the nucleus cemeteries

Two broad scenarios present themselves for explaining the rise of the original, large-scale mastabas of the so-called nucleus cemeteries: either the royal court approved the assignment of each and every mastaba to an individual prior to construction, or the cemeteries were planned and laid out first and only afterwards assigned to specific individuals. The latter scenario receives usually more support from Egyptologists³⁸.

³⁷
³⁸

In G 5170 the names of kings Snefru, Khufu, Khafre, Userkaf, Sahure and Nefrirkare were mentioned.
MANUELIAN, *JARCE* 35, 115-126.

4.1 Occupations of owners

One of the most common assumptions about cemetery organization is that tombs' areas were allocated to persons according to their occupations. Helck³⁹ suggested that the core cemeteries were owned by officials who were connected with royal construction projects and their dependants. While this hypothesis can be demonstrated well in the later parts of Giza cemetery where areas of tomb clustering according to owners' occupations exist⁴⁰, its validity within the nucleus cemeteries is less evident.

The 125 mastabas in the 6 nucleus cemeteries have only 56 known owners. To test the above mentioned hypothesis, the highest administrative titles of such owners were initially classified into 6 categories following the principles of Strudwick⁴¹:

The vizierate: represented by the title *t3yty s3b 3ty*.

The legal system: represented by the titles *imy-r3 hwt wrt*, *imy-r3 hwt-wrt 6*, and *s3b 3d-mr*

The scribal bureaucracy: including titles *imy-r3 zš 3nzw*, *mdh zš nzw* and their variations

The organization of labor: represented by the title *imy-r3 k3t nbt nt nzw*

The organization of granaries: represented by the title *imy-r3 šnwt nzw*

The organization of treasuries: represented by the title *imy-r3 prwy-ḥd*

Since however the last two classes⁴² have very few bearers, they were not included in this spatial analysis and another important class including the titles of priesthood and of religious nature was added instead.

For each of the above mentioned 5 categories, a nearest neighbor analysis was performed (maps 1.5, 1.6, 1.7, 1.8, 1.9). Since the nearest neighbor index for each group was found to be greater than 1, the trend of distribution of tombs is toward randomness or dispersion. There is thus no reason to believe that tombs cluster according to occupations of owners, a result which is also confirmed when comparing the directional distribution of those groups represented by their standard deviational ellipses (map 1.10). The similar sizes and shapes of those ellipses and their large area of overlapping indicate no special trend of land allocation according to owner's titles. It is only in the case of scribes that it is possible to notice an obvious trend towards burial in the western field. It is also worthy of attention that, with exception of the ellipse of scribes, all ellipses agree in size and direction with the general directional ellipse of all tombs.

³⁹ HELCK, ZÄS 81, 62-65.

⁴⁰ Like the cluster of *hnty-š pr-3* to the northeast of G 2000. See ROTH, *Giza VI*.

⁴¹ STRUDIWICK, *Administration*, xiv.

⁴² Only one person bears the title *imy-r3 šnwt nzw* (G 4750), and two persons bear the title *imy-r3 prwy-ḥd* (G 2110 and G 4750)

4-2 Genealogical relations

Genealogical relations have been proposed long ago as the principle which governed the organization of the nucleus cemeteries. Reisner suggested that the earliest three nucleus cemeteries in the western field were each occupied by the burials of the children of one of Khufu's wives and their supporters, suggesting that organization of the major mastabas of Giza cemetery was based on family relations⁴³. Smith⁴⁴ argued for a genealogical placement as well. However, the recognition of family relationships between tomb owners has remained controversial so far and the only fact known with some certainty is that royal family members in the reign of Khufu were buried in the ECE, although again the genealogical relationships between them are often based on tomb placement, causing arguments to be circular. The genealogy of the first and second generations of the family of king Khufu is formed of a series of hypothesis depending mainly on one factor: the proximity of the tombs of his proposed sons, daughters, grandchildren and wives to the pyramid of the king. As for the non royal owners in the WCE, it is only in rare cases that a person is mentioned in more than one mastaba, causing difficulties in tracing genealogical ties . The argument of genealogical allocation is thus hard to confirm.

5- Titles of owners versus tomb size and effort expenditure

There is a widely accepted hypothesis that the greater the area of the cemetery ground occupied by a tomb, the higher the rank of its owner⁴⁵. To test this hypothesis in Giza the means of tomb areas of each of the above mentioned five title categories in addition to the royal tombs were represented on a bar graph (graph 1.1). For the purpose of comparison, another category of the mastaba owners with titles other than the six already mentioned categories was added. It could be noticed that the bearers of the title *imy-r3 k3t nzwt* have the largest average tomb size, followed by the bearers of royal titles. The average tomb area of the following three groups (religious, *t3ty*, scribes) is very similar and the bearers of legal titles own smaller tombs in general. While no special trend was noticed in the distribution of tombs of the different occupation groups, their economic status is significant. It is clear that bearers of these 6 title groups were privileged in terms of the area allocated to their tombs in comparison to tombs of the non bearers. The calculation of effort expenditure presents a similar result. To estimate the effort used for the mastabas in the nucleus cemeteries, the

⁴³ REINSER, *Giza I*, 77-78.

⁴⁴ SMITH, *Appendix*, 393.

⁴⁵ ROTH, *Giza VI*, 2; KANAWATI, *Administration*, passim.

volume of cores, shafts and burial chambers⁴⁶ were calculated. Results were allocated to tombs of the above mentioned six title groups to estimate their financial resources, and the means were represented in graph 1.2. The high financial abilities of the members of the six title categories is evident when comparing them to the other owners.

6- Status and wealth in nucleus cemeteries

Comparing the sizes of original cores, their types and the quality of the building ground Reisner put the three earlier cemeteries in ECE in an order of importance:

- a) The family group represented by the five initial cores of cemetery G 4000 was obviously more important in the favor of Khufu than the other two family groups.
- b) The family represented by cemetery G 2100 is smaller and less powerful than that of cemetery G 4000, and less enduring than that of cemetery G 1200.
- c) Family of G 1200 appears to have increased in importance after the beginning of the cemetery.

To investigate how far the assumptions of Reisner are true, it was necessary to research the earlier tombs in each nucleus cemetery. Effort expenditure as expressed by the total cubic volume of the substructure and superstructure for all tombs was represented on a line graph (graph 1.3). Though values fluctuate in each cemetery, it is obvious that cemeteries G 2100, G 1200 and G 4000 have the lower range of cubic volume. For the purpose of a clearer comparison for those 3 cemeteries the means of volumes of those tombs which Reisner described as the initial ones⁴⁷ were represented on a bar graph (graph 1.4).

With all probability Reisner has assumed that the owners of G 4000 had more favor at the court of Khufu based only on the quality of their piece of land, because there is no other reason to consider any special privileges for those owners. The 4 initial mastabas in G 4000 seem indeed the least wealthy in means of effort expenditure in comparison to other cemeteries. The most predominant mastaba is G 4000 with its strikingly large size. Parallel Mastabas of exceptional size occur in other cemeteries as well, and are no sufficient justification to consider a privileged status for the whole cemetery. Land quality alone has led Reisner also to believe that the owners of G 2100 were the least authoritative, though the cubic effort of its earlier 5 tombs exceeds those of cemeteries G 1200 and G 4000.

Taking the titles of the early owners of those 3 nucleus cemeteries into consideration we are faced by one person who bears the title *z3 nzwf* in each cemetery and by other owners who

⁴⁶ Information for volume of one or more shaft and /or burial chamber was missing for some mastabas: in cemetery GIS (II of Junker, GIVS, G VIII S, GXS) and in CEE (G 4980, G 5070, G 5050). These tombs were not taken into consideration for the effort expenditure analysis, so that they do not produce misleading results.

⁴⁷ Tombs G 1201, G 4000 and G 7510 were excluded from calculations because of their extreme values.

are either unknown or of less important titles. It is true that the later cores of cemetery G 4000 show more occurrences of owners with important titles than the other nucleus cemeteries, but then again this is a statistical phenomenon linked to the large number of the tombs in cemetery G 4000.

Cemetery G 7000 has the largest volumes on the effort expenditure graph, stressing perhaps the wealth of its royal occupants⁴⁸. More worthy of attention are the cores of CEE , which come only second to cores G 7000 in the means of their superstructure volume. This point coupled with the fact that owners of the highest 6 administrative titles occur often in CEE should increase the potential weight of this cemetery in the socio-economic development of the WCE.

7- Secondary cemeteries

Large spaces of unoccupied land were left east, west, and north of the four nucleus cemeteries in three large groups in the WCE : between cemetery G 1200 and G 2000, between G 2000 and cemetery G 2100, and between the western end of G 4000 and the two spaces already mentioned. All these spaces among and around the four original cemeteries became later occupied by countless secondary tombs of different sizes. Each main mastaba in the nucleus cemeteries became in turn the nucleus of a small group of later tombs built in the streets north, east, and south of it, usually abutting on the nucleus mastaba. These later mastabas were used either for members of the family of the owner of the nucleus mastaba or for his ka-priests. In the ECE later tombs were built around the main Fourth Dynasty cores and to the east of the mastaba line G 7820- G 7670, many of which were rock cut tombs of small sizes. A considerable number of the smaller tombs in ECE and WCE are uninscribed and are even as late as the First Intermediate Period. Those minor mastabas are difficult to pinpoint precisely in time due to the absence of artifacts or inscriptions. One must rely on the archaeological and architectural context for dating.

7- A Spatial characteristics of secondary cemeteries

To study the general spatial distribution of secondary cemeteries after the Fourth Dynasty, later tombs were divided into two broad categories according to their clustering:

A-Tombs clustering around the main mastabas in the Fourth Dynasty. Those include the following groups:

1-Secondary mastabas around the original cores of CEE.

2-Secondary mastabas around the original cores of cemetery G 4000

⁴⁸ For a definition for those considered of royal origin within the current research see infra p.187.

3-Secondary mastabas around the original cores of cemetery G 2100,

4-Secondary mastabas around the original cores of cemetery G 1200.

5-Secondary mastabas around the original cores of ECE

6- Secondary mastabas around the original cores of G I S

For each group the pattern of tomb distribution was analyzed by the four spatial statistics tools: the average nearest neighbor, the Getis Ord general G, the Replys K function and the Moran's I. The last tool traced that the tombs in cemeteries G 2100, G 4000 and CEE cluster according to their size. The directional distribution ellipse showed that secondary tombs tended to concentrate towards the south of their nucleus cores in the three older cemeteries G 1200, G 2100 and G 4000, resulting in a higher number of secondary tombs on the southern border of each cemetery. Most probably those are the earlier tombs whose owners desired not to block the streets of the cemetery.

B- The tombs in areas which grew independently , not clustering around the main Fourth Dynasty cores. This category includes

1-Secondary mastabas to the east of the three rows of CEE and to their north until G 5090.

2- Secondary mastabas to the north and northeast of G 2000⁴⁹.

3- Secondary mastabas in the great space bordered on the south by the northern line of G 4000 and on the north by core G 2000, and running to the west of that core to the end of the cemetery. Although this is a huge group of tombs in comparison with the others under study, those tombs were considered a separate category because they apparently grew independently with no relation to the older great mastabas. Tombs in this space seem even to grow in the direction of the Abu Bakr cemetery. However because of the lack of maps for the greatest part of Abu Bakr cemetery, and since only few of its tombs were included in the map of Reisner for the WCE, those tombs were not included in this group so that they do not cause a misleading impression that tombs tend to disperse to the west.

4- The eastern and western parts of Abu Bakr excavations in 1949-1950, and the tombs of the three excavation seasons 1950-1, 1952 and 1953 .

5-Tombs in the Eastern cemetery to the east of the main cores.

6-Tombs of the Central Field.

By applying the above mentioned spatial statistic tools to these groups, a pattern of dispersion or randomness prevailed for the tombs of groups B 2 and B 6.

⁴⁹ There is a line of tombs on the eastern wall of G 2000 which was obviously dependant on it, but those tombs were in spite of that included in this group.

The Morans I index showed that tombs in groups B1, B 3, B 4 and B 5 cluster according to their sizes. The same result is reached for the groups B 3, B 4 and B 5 by a hot spot analysis (map 1.11) which demonstrated that those three areas in particular have high homogeneity concerning the sizes of its tombs. Clustering of tombs may reflect that different groups experienced economic social complexity consistent with a competition model. The increasing competitiveness of those individuals is evident in the placement of their tombs, the closeness of which gives the impression that different families were competing for the best place to build their tombs.

8- B A spatial metaphor for chronology in the secondary cemeteries

Attempting to find a spatial metaphor for chronology which could be used to recognize different building areas in the cemetery, it was assumed that areas of higher density of tombs are of later relative date than those of lesser density. In other words the building sequence in each cemetery can be traced in the direction of the decreasing distance between tombs. Higher density of tombs in one area is formed by two factors: the decreasing distance between tombs and their small sizes. Reisner assumed that mastabas of larger size are earlier because large mastabas could only have been made when large spaces were still clear between the independent mastabas. To test this hypothesis, the tombs of several small cemeteries were examined.

By applying a point density tool to the tombs of cemeteries G 1000 and G 1100 (map 1.12), it became clear that the density of tombs increases in the study area from south to north and from west to east. The most densely occupied area is the northwest corner suggesting that it is the latest area in the cemetery and agreeing with the dating Reisner attributed to those tombs based on their types⁵⁰. Thiesen polygons were drawn around the main cores of this cemetery⁵¹ (G 1221, G 1109, G 1020, G 1044, G 1024, G 1101). The largest number of tombs are those which are located in the northwest corner within the dominance area of G 1044. That later group of tombs has obviously lost the connection to the center and extended independently to the north east. The same tendency of tombs to extend towards the north east can be noticed in cemeteries G 1400, G 1600 and G 3000 (map 1.13). Here again the number of tombs increases towards the north east corner.

The sequence of building suggested by the density maps for cemeteries G 1000, G 1100, G 1400, G 1600 and G 3000 is also supported when the visibility factor is taken into consideration. It was always the wish of tomb owners to expose their chapels on the eastern

⁵⁰ REISNER, *Cemetery G 1000-1100*, 1-13.

⁵¹ Those which Reisner designates as early or on independent sites.

face of the mastaba to be viewed by the visitors and the passers by. Plate 1.1 demonstrates that the constant tendency to build towards the east caused older tombs in this cluster to have less share of visibility, if any. To acquire the best possible view on the plateau might have been also a competitive element which governed the expansion of the cemetery. When a viewshed analysis was made for two tombs with no more than 50 meters of distance (plate 1.2), the range in view difference between both was very wide, demonstrating the significant change of visibility according to the location of the tomb.

The situation in cemeteries G 2000 and G 2200 was more complicated. Not only was their growth limited by their position between mastaba G 2000 and cemetery G 2100, but also a bad rock area happens to be located in the center of its building ground. According to their types, the earlier tombs are those at the eastern border of the cemetery. Later tombs extended from east to west until the eastern wall of G 2000, blocking access to its chapel. When the land in that direction was consumed, another building ground to the north was initiated, avoiding the bad rock area in the middle. In this case too growth extended from east to west, using the land adjacent to G 2000 as the last option. The point density map of this cemetery (map 1.14) reflects the same development scenario.

The growth of cemetery G 6000 was also limited by natural features (Schiaparelli quarry) and by the existence of earlier cemeteries (Steindorff cemetery). The area of higher density in G 6000 is at the North West corner, where it meets with the adjacent Steindorff cemetery. That meeting area in particular has more density of tombs in both cemeteries which might indicate their simultaneous growth in opposite directions (map 1.15).

That dense areas of tombs are of later date is better demonstrated by CEE. Here two secondary cemeteries developed; one to the east of the 3 original lines of the cemetery, and one to their north. The density map of the first cemetery indicates its growth towards the north until it was stopped by the existence of the *sndm-ib* complex⁵². The north cemetery on the other hand grew towards the west extending beyond the earlier line of tombs G 2440-G 5280, and turning later to the southwest, which was the latest part of the cemetery. The Distribution of the names of kings within the two cemeteries supports the same growth tendency. Names of kings of the fifth and sixth dynasties occur more often in the high density areas than in less occupied parts, where the name of king Khufu is more predominant (map 1.16).

The same principle can be applied to the central area of the western cemetery, for which little research has been done, to set a general scenario concerning the development of the area. The line of tombs adjacent to cemetery G 4000 (D 110- D118) is certainly the earliest, not only

⁵² Or by the mastabas which antedated the complex in the same location, as Reisner believed that G 2370 replaced older constructions (G 2371, G 2372, G 2373).

because the area has less density of tombs, but also according to Junker who estimated the dating to be between the end of the Fourth Dynasty and the beginning of the Fifth Dynasty. The density map gives the impression that the cemetery developed from outside to inside, from west to east, the latest areas being thus those in the center of the cemetery. Visibility plays here also an important role, this time as a motivator for earlier builders to build their tombs as close as possible to the outer borders of the block, inner tombs being much less visible (plate 1.3).

Following the lines of direction created by the density map, it is overwhelming to notice that the great pyramid had little spatial weight during the later phase of the western cemetery development if any. Local considerations and topographical features on the other hand played a greater role in the organization of tombs.

Secondary tombs around the main cores of the nucleus cemetery express chronology through a different spatial statement. Those tombs which were built on the eastern face on the mastaba, intruding the funeral service of its chapel, or in the middle of cemetery streets, blocking their access, should be in general considered later than the secondary tombs which respected the layout of the necropolis. To recognize tombs of the first type, a selection by location was applied to all secondary tombs within 80 cm distance of the main cores, the minimum space to maintain traffic between two tombs. The outcome of this selection demonstrates that the largest number of intrusive tombs was located around the main cores of G 4000. A point density map shows however that the most densely occupied area was around the cores of G 2100. This area of high density continues through the density map of the central area of the WCE (area marked with red circle in map 1.17). It is difficult however to claim that either of the areas was an extension of the other, since tombs around the main cores are associated with a different context of family relations and funerary service.

Chapter Two

Known Owners in CEE

Tomb no. G 2184			
Name: <i>3ht-mr-nzwt</i>			
Titles	Relating to palace: <i>imy-r3 n hnty-š pr-ḫ3, imy-r3 iz n hnty-š pr-ḫ3</i>		
	Religious: <i>wḫb nzwt</i>		
	Honorific: <i>rh-nzwt.</i>		
Family-dependants	Father	<i>k3-nfr</i>	<i>rh-nzwt</i>
	Mother	<i>tn</i>	<i>hmt-ntr hwt-hr Nt</i>
	Son	<i>3ht-mr-nzwt</i>	
Bibliography PM III, 80. BAER, <i>Rank and title</i> , 52 (4). BOTHMER, <i>BMFA</i> 46, 35-36. REISNER, <i>Additions</i> , 90-94.			
Remarks Apparently <i>3ht-mr-nzwt</i> completed the mastaba of his father <i>k3-nfr</i> . The chapel of this mastaba was bought from S.A. and sent to Boston. A fire broke out on the steamer and the hold containing the shipment was flooded with water which ruined all the painted stones. The name of the mother in PM is <i>nwwt</i> .			

Tomb no. G 2375			
Name: <i>3ht-mḥw</i>			
Titles	Other: <i>z3b iry Nhn hry d3d3 nhb</i>		
Bibliography PM III, 87. REISNER, <i>sndm-ib</i> , 140.			
Remarks In GA G 2375 and G 2375a are considered one tomb. However Reisner in his unpublished documents attributed G 2375 to <i>3ht-mḥw</i> and G2375 a to <i>ḥnh-ir-ptḥ</i> and commented that G 2375a was built later in the court of G 2375 .			

Tomb no. G 2196			
Name: <i>i3-sn</i>			
Titles	Relating to palace: <i>hnty-š pr-ḫ3</i>		
	Religious: <i>shd wḫbw , hm-ntr hwfsw.</i>		
	Honorific: <i>rh-nzwt.</i>		
	Other: <i>hry-sšt3 , imy-r3 6, shd hntyw-š.</i>		
Family dependant	wife	<i>mrt-it.s</i>	<i>rh-nzwt</i>
	Probably son	<i>mry-ḥnh</i>	<i>hnty-š pr-ḫ3, wḫb nzwt, rh-nzwt</i>

s			
Bibliography PM III, 82. KENDALL, "An unusual Rock-cut tomb at Giza", 104, n. 1. REISNER, <i>Additions</i> , 108-111 b.			
Remarks The rock cut chapel of <i>i3-sn</i> has been ingeniously contrived in association with mastaba G 2196, which probably was constructed for <i>i3-sn</i> himself. It is possible however that <i>i3-sn</i> was not the original owner of the superstructure but only dug his chapel underneath the mastaba, usurping thus its corridor for himself.			

Tomb no. G 5020	
Name: <i>ii-m-htp</i>	
Titles	Honorific: <i>rh-nzwt</i>
Bibliography REISNER, <i>BMFA</i> 36, 28.	
Remarks The name of the owner was retrieved from an offering basin but there are no inscriptions in the mastaba.	

Tomb no. G 2172			
Name: <i>ip</i>			
Titles	Religious: <i>w^cb nzwt</i>		
Family - dependants	Wife	<i>k3-ib</i>	<i>rh^t-nzwt</i>
	Son	<i>pth-^cnh</i>	
	Daughter	<i>^cnhwt</i>	
Bibliography FISHER, <i>BMFA</i> 11, 22. REISNER, <i>Additions</i> , 81. SMITH, <i>Egyptian Sculpture</i> , 191.			
Remarks			

Tomb no. S 757	
Name: <i>ipw</i>	
Bibliography PM III, 165. JUNKER, <i>Giza</i> VIII, 66	
Remarks	

Tomb no. G 2192
Name: <i>inn-k3</i>
Titles
Bibliography REISNER, <i>Appendix A</i> , 25.
Remarks

Tomb no. G 2391.			
Name: <i>ir-n-3ht iri</i>			
Titles	Relating to palace: <i>imy-r3 idt-hnty-š pr-ᶜ3, imy-r3 iz hnty-š pr-ᶜ3,</i>		
	Religious: <i>imy-r3 wpt hmw-k3.</i>		
	Other: <i>imy-r3 pr.</i>		
Family	Wife	<i>k3.s-it.s</i>	<i>hmt-ntr hwt-hr nbt nht, rht-nzwt.</i>
	Sons of both	<i>nfr-mḥi</i>	<i>šps nzwt, šd pr, hm-k3, imy-ht hnty-š pr-ᶜ3, imy-ht imy-r3 wpt pr-ᶜ3, imy-r3 wpt hmw-k3.</i>
		<i>hnm-inti</i>	<i>hm-k3.</i>
	Sons of <i>ir-n-3ht</i>	<i>sndm-ib</i>	<i>imy-ht pr-ᶜ3, hm-k3.</i>
		<i>inti</i>	
	Daughter of <i>ir-n-3ht</i>	<i>sšt</i>	
	Daughters of <i>k3.s-it.s</i>	<i>nsit.f</i>	
		<i>hwit</i>	
	Wife of <i>nfr-mḥi</i>	<i>bbi</i>	<i>Rht-nzwt, imyt-r3 (ikkdw ? mdh?)</i>
	Sons of <i>nfr-mḥi</i>	<i>nfr</i>	
		<i>mḥi</i>	
		<i>inti</i>	
		<i>nfr-hnt</i>	
	Daughters of <i>nfr-mḥi</i>	<i>h3t-k3w</i>	
<i>nbt</i>			
<i>hwin-shmt</i>			
Mentioned	<i>sndm-ib-mḥi</i>		
	<i>h3i</i>	<i>shm hb</i>	
Bibliography PM III, 92. REISNER, <i>sndm-ib</i> , 180-1.			
Remarks This tomb records the genealogy of four generations of funerary priests of <i>sndm-ib</i> family.			

Tomb no. <i>iri-n-3hti</i>			
Tomb no. G 2156b			
Name: <i>ir-n-rᶜ</i>			
Titles	Religious: <i>wᶜb nzwt, imy-r3 hm-k3 dt.f k3-n-nzwt, šd hm-ntr</i>		
Family-	Father	<i>k3-n-nzwt III</i>	Probably G 2156 a

dependants	Son	ᶜnh-m-rᶜ	G 2156c	
Bibliography JUNKER, <i>Giza III</i> , 156-63. BAER, <i>Rank and title</i> , 58 (51).				
Remarks The unusual length-width ratio of this mastaba led Junker to believe that it consisted of two parts: the eastern part which was built by <i>ir-n-rᶜ</i> and the western part which was built by his son ᶜnh-m-rᶜ. What supports this belief is a text on the eastern side of the entrance corridor which mentions that that the tomb was made for <i>ir-n-rᶜ</i> by his son ᶜnh-m-rᶜ. The western part of the mastaba was considered thus a separate tomb of ᶜnh-m-rᶜ (G2156c).				
Name: <i>iri-n-ᶜhti</i>				
Titles	Honorific: <i>šps nzwt</i>			
	Other: <i>smr pr</i>			
Bibliography PM III, 167.				
Remarks The two shafts S 688 and S 733 seem to have belonged to this tomb too.				

Tomb no. G 5330, LG 41.				
Name: <i>ihy</i>				
Titles	Legal : <i>imy-rᶜ ḥwt-wrt</i>			
	Relating to expeditions: <i>imy-rᶜ wpwt m t3 r dr.f</i>			
	Other: <i>hry-tp nswt, iwn knmwt, imy-rᶜ gs-pr m prwy, mdw rhyt</i>			
Family-dependants	Probably wife	<i>tᶜi</i>	<i>rḥt-nzwt</i>	
Bibliography PM III, 159. BEAR, <i>Rank and title</i> , 59 (56). REISNER, <i>Additions</i> , 38.				
Remarks				

Tomb no. G 5232				
Name: <i>itti</i>				
Family-dependants	mentioned	<i>bb-ib</i>	<i>šḥd z3b zš</i>	
		<i>ḥsst</i>	<i>ḥmt-ntr ḥwt-ḥr</i>	
Bibliography PM III, 157.				

Remarks
Though the title of *hsst* is in masculine form, the determinative of the name is feminine.

Tomb no. <i>idw</i> II	
Name: <i>idw</i> II	
Titles	Relating to palace: <i>hry-tp nzwt pr-ʿ3</i>
	Scribal: <i>zš ʿ nzwt, zš ʿ nzwt hr ht.f, shd zš ʿ nzwt</i>
	Other: <i>imy-r3 pr ʿš, hry-tp nzwt</i>
Bibliography PM III, 165-166. Baer, <i>Rank and title</i> , 62 (79).	
Remarks	

Tomb no. G 2155, G 4870				
Name: <i>k3-n-nzwt</i> I				
Titles	Honorific: <i>smr wʿty</i>			
	Religious: <i>sm, wb3 hr, hm-ntr nb Imt z3 mht, hry-hbt.</i>			
	Royal: <i>z3 nzwt, z3 nzwt n ht.f.</i>			
	Other: <i>hrp-šndwt, ʿd-mr dp, hry-sšt3 n pr dw3t, hry-tp Nhb, hry wdb hwt -ʿnh, hk3 B3t, hrp hs3t km, imy-ht h3, wʿ wrw hb, smr</i>			
Family-dependants	Wife	<i>nfr-h3-nzwt</i>	<i>rht -nzwt</i>	
	Sons	<i>k3-n-nzwt-šri</i>	G 2156	
		<i>hr-wr</i>		
	Daughter	<i>wd3t-htp</i>		
	Mentioned	<i>wḥm-k3i</i>	<i>imy-r3 pr</i>	D 117
		<i>k3-m-nfrt</i>	<i>imy-r3 pr</i>	
		<i>pry-ndw</i>	<i>imy-r3 sšr</i>	
		<i>sštw</i>	<i>imy-r3 sti</i>	
		<i>mry-ntrw ḥwfw</i>	<i>zš ist</i>	
		<i>tnti</i>	<i>hrp sh</i>	
		<i>ni-ʿnh-ḥwt-ḥr</i>		
		<i>pr-sn</i>	<i>sd3wty</i>	
		<i>ii-nfrt</i>	<i>sšm</i>	
		<i>isi</i>		
		<i>imy-shr</i>		
		<i>k3-iry</i>	<i>wdpw</i>	
<i>ni-ʿnh-ḥwt-ḥr</i>				
<i>ʿnhi</i>				
<i>snb</i>				
<i>sšmw</i>				

	<i>w3h-ib, htp-spit, pnw, hry-mrw, k3-m-hst, stb, iny-istf, hry-ib, mdw, ppi, ihsi, htp, dw-nfr-htp, ibi-k3-ptih, tst, hnmw-htp, kd-mrr-s3hi, mnh-k3, ph-r-nfr, r^c-htp, tnti, k3-m-whm, msi</i>	<i>zš</i>
	<i>imy-shr, pnw, w3h-ib, ^cnh-h3.f, šndw, mry-ntrw-hwfw, snb-rdi-tw, itf, hwfw-snb. hwfw-^cnh, iti, smr-k3</i>	<i>hm-k3</i>

Estates: 30 in number

1. *grgt k3-n-nzwt*
2. *grgt k3y*
3. *grgt w^cb-sw*
4. *grgt nfr-sšm*
5. *grgt-mr-iw-n.f*
6. *w3t*
7. *grgt nfr-^cnh*
8. *snsnt*
9. *hwt ^cftyw*
10. *grgt r^cy*
11. *int wp*
12. *grgt s3-ib*
13. *iwntyw*
14. *hnd3t*
15. *mr-r^c-hwfw*
16. *sh^t hdt*
17. *s3w*
18. *nbs snfrw*
19. *grgt k3-n-nzwt*
20. *grgt ish3h*
21. *bst*
22. *grgt phr*
23. *pr hm*
24. *smwt*
25. *grgt k3-n-nzwt*
26. *grgt snfrw*
27. *int nbi*
28. *t3rt*
29. *pn^ct*
30. *grgt sšmw*

Bibliography

PM III, 78-9.

Remarks

This mastaba is located in cemetery G 2100 but was included in the current research because of the kinship tie with the owners of G 2156 b and G 2156 c. The building of this mastaba forms with mastaba G 4770 the connection between G 2100 and G 4000. Junker wondered to which cemetery G 4870 belonged but opted for cemetery G 2100 because the front of the original building of the core is located aligned with the north mastabas G 2160-70.

Tomb no. G 2156

Name: <i>k3-n-nzwt II</i>			
Titles	Relating to palace: <i>hrp ʕh</i>		
	Religious: <i>sm</i> , <i>hm-ntr m3ʕt</i> , <i>hm-ntr hwfsw</i>		
	Honorific: <i>rh-nzwt</i>		
	Other: <i>wr md šmʕw</i> , <i>hry-sšt3 nb.f</i> , <i>nst hntt</i>		
Family - dependants	Father	<i>k3-n-nzwt I</i>	G 2155
	Mother	<i>nfrt-h3-nzwt</i>	
	Son	<i>k3-n-nzwt III</i>	G 2156 a
Bibliography PM III, 79-80. BAER, <i>Rank and title</i> , 145 (532).			
Remarks This tomb is located in cemetery G 2100 but was included in the study because of the family relation with the owners of G 2156b and G 2156c. <i>k3-n-nzwt III</i> (G 2156a) finished the mastaba of his father and decorated it with scenes.			

Tomb no. G2156a			
Name: <i>k3-n-nzwt III</i>			
Titles	Other: <i>rh-nzwt</i>		
Family-dependants	Father	<i>k3-n-nzwt II</i>	G 2156
	Son	<i>iri-n-rʕ</i>	G 2156 b
Bibliography PM III, 80.			
Remarks Junker (Giza II, 163) proposed originally that this tomb may belong to the two children of <i>hr-wr</i> and <i>w3dt htp</i> , but after a second consideration it seemed more reasonable to him that <i>k3-n-nzwt III</i> was buried here. Though it cannot be assured that this tomb belongs to <i>k3-n-nzwt III</i> , it is certain that the later finished the tomb of his father <i>k3-n-nzwt II</i> . It is also known from the inscriptions of the mastaba of <i>iri-n-rʕ</i> that the later was the overseer of the <i>k3</i> -priests of his father <i>k3-n-nzwt III</i> .			

Tomb no. G 2375a			
Name: <i>ʕnh-ir-ptḥ</i>			
Bibliography BAER, <i>Rank and title</i> , 63 (87). REISNER, <i>Giza I</i> , 285.			
Remarks G 2375a was built later in the court of G 2375 but its borders or precise location within the court are not clear from the documents of Reisner. The most probable location was represented on my map. There is another owner with the same name in G 4811-4812 dated by Baer to dynasty VI.			

Tomb no. G 2156 c			
Name: <i>ḥn-m-r</i>			
Titles			
Family-dependants	Father	<i>ir-n-r</i>	G 2156b
Bibliography PM III, 144-145.			
Remarks			

Tomb no. <i>ḥn-wd3 iti</i>			
Name: <i>ḥn-wd3 iti</i>			
Titles	Legal: <i>z3b imy-r3 zš</i>		
	Scribal: <i>zš ḥ nzwt ḥft ḥr</i>		
	Other: <i>hry-tp</i>		
Family-dependants	Wife	<i>mrw-k3</i>	<i>rḥt-nzwt</i>
	Son	<i>ibbi</i>	<i>šps nzwt</i>
	Daughter	<i>ḥnwt-sn</i>	
	Probably grandson	<i>ibbi</i>	
	Mentioned	<i>t3st</i>	<i>rḥt-nzwt, ḥmt-ntr ḥwt-ḥr</i>
Estates: 4 in number			
<ol style="list-style-type: none"> 1. <i>nfr irt...</i> 2. <i>mn-ḥr msn ḥn dd-k3-r</i> 3. <i>srwd pth-ḥn n wnis</i> 4. <i>mr ḥr msn ḥn wnis</i> 			
Bibliography PM III, 167. BAER, <i>Rank and title</i> , 63 (89).			
Remarks			

Tomb no. G 4911			
Name: <i>ḥn-tf</i>			
Titles		Religious: <i>w^cb nzwt, ḥm-ntr ḥwfw</i>	
Family-dependants	wife	<i>df3t</i>	
Bibliography PM III, 141.			

Remarks
There is another owner¹ with the same name in the middle field, dated by Baer to the dynasty VI.

Tomb no. G 2415			
Name: <i>wri</i>			
Titles			
Family-dependants	Wife	<i>mti</i>	<i>rḥt-nzwt, ḥmt-ntr ḥwt-ḥr nbt nht, ḥmt-ntr Nt wpt w3wt.</i>
	Mentioned	<i>iḥwi</i>	
		<i>bbi</i>	
Bibliography PM III, 93. REISNER, <i>Cemetery 2400</i> , 124.			
Remarks			

Tomb no. G 2383 C1			
Name: <i>wr-k3w-b3 ikw</i>			
Titles	Relating to vizierate: <i>t3yty z3b t3ty</i>		
	Legal: <i>imy-r3 ḥwt-wrt</i>		
	Other: <i>smr</i>		
Family-dependants	Probably wife	<i>tfrt</i>	<i>rḥt-nzwt, ḥmt-ntr ḥwt-ḥr</i>
	Son	<i>ikw</i>	<i>smr w^cty, zš nzwt</i>
Bibliography Brovarski, <i>Giza VII</i> , 35. REISNER, <i>BMFA</i> 11, 53-66. REISNER, <i>šndm-ib</i> , 151 STRUDWICK, <i>Administration</i> , 81 (40).			
Remarks Reisner recorded this construction as a chapel, but GA records it as a mud brick mastaba. Since no shaft was found in or behind this chapel, Reisner felt that <i>wr-k3w-b3 ikw</i> was buried in one of the successive additions (G 2376 or G 2377) to the west side of the mastaba of <i>mḥi</i> . Brovarski found it more likely that he was buried in an intrusive shaft constructed in the serdab of <i>mḥi</i> 's G 2378 b. Additionally a statue of a <i>wr-k3w-b3 ikw</i> was found in the temple of the pyramid of Menkaure, where the owner bore the titles of <i>smr-w^cty</i> and <i>hry-ḥbt hry-tp</i> among others. This statue may have belonged to the same man as the false door in the chapel of G 2383, although no relevant title is found as to confirm this suggestion.			

Tomb no. G 5230, LG 40	
Name: <i>b3-b3.f</i> (also sometimes read <i>ḥnmw-b3.f</i>)	
Titles	Relating to vizierate: <i>t3yty z3b t3ty</i>
	Labor / construction: <i>imy-r3 k3t nbt nzwt</i>

¹ Hassan, Giza V, 225-35: Baer, Rank and title, 65 (101).

	Honorific: <i>smr-w^cty, iry-p^ct</i>		
	Religious: <i>hm hpwi, hm-hr šw3, hm-ntr wn-rw hnti hmi, hm-ntr hr km3^c, hm-ntr dhwti</i>		
	Royal: <i>z3 nzwt, z3 nzwt n ht.f, smr-w^cty n it.f</i>		
	Other: <i>h3ty-^c, smsw snwt, sdy nzwt, imy-is Nhn, 3 dw3w, 3d-mr dw3 hr-hnty-pt, wr idt, wr diw pr-dhwti, mnw Nhn, hm i3ks, hry-sšt3 n pr-dw3t, hry-sšt3 n mdw ntr, hry-tp nhb, hrp 3h, hrp mrt, ht wr, hry-hbt hry-tp, smr</i>		
Family-dependants	Probably father	<i>dw3-n-r^c</i>	G 5110
<p>Bibliography PM III, 155-6. BAER, <i>Rank and title</i>, 117 (399). BAUD, <i>Famille Royale</i>, 442-3 (55). REISNER, <i>Additions</i>, 32. REISNER, <i>Appendix A</i>, 36-43. REISNER, <i>Giza I</i>, 248. RÖMER, <i>Königsöhne</i>, 78. RZEPKA, <i>MDAIK</i> 56, 2000, 353-60. STRUDWICK, <i>Administration</i>, 82-3 (42). SCHMITZ, <i>Königsson</i>, 75-76 (366).</p>			
<p>Remarks The tomb is not decorated and yet a huge number of statues originated from it. Although the serdab contained a large number of statues, Reisner mentioned that it was not used for funerary services. Many fragments of statues were found scattered around the area east and south of the mastaba mixed with fragments of alabaster and diorite royal statues.</p>			

Tomb no. G 2385			
Name: probably <i>pth-mr-3nh-ppy</i>			
Family	brother	<i>mry-r^c-mry-pth-3nh nhbw</i>	G 2381
<p>Bibliography PM III, 92. BROVARSKI, <i>Giza VII</i>, 1, 2, 31.</p>			
<p>Remarks The owner name of this mastaba did not survive but Borvarski suggested that the owner might be a brother of <i>mry-r^c-mry-pth-3nh nhbw</i> (G 2381) . Two brothers are known for <i>nhbw</i>: the younger brother <i>mr-3nh-ppy</i> who is represented in G 2381 and another unnamed elder brother who is mentioned in the biography of <i>nhbw</i>. The owner of G 2385 might have been buried in the sloping passage tomb G 2387 A, which PM cites as G 2387.</p>			

Tomb no. G 2197	
Name: <i>pn-mrw</i>	
Titles	Religious: <i>w^cb nzwt, hm-ntr mn-k3w-r^c, imy-r3 hmw-k3</i>
	Honorific: <i>rh-nzwt</i>

	Other: <i>hrp sh, sn dt.</i>		
Family-dependants	Wife	<i>mrt-it.s</i>	<i>mitrt</i>
	mentioned	<i>nfr-htp</i>	<i>sn dt</i>
Bibliography PM III, 82. BAER, <i>Rank and title</i> , 71 (140). REISNER, <i>Additions</i> , 112-113 b. SIMPSON, <i>Giza IV</i> , 24-27, figs. 27, 39, pls. 46-8.			
Remarks Nine lines of text in the chapel contain the will of deceased in favor of <i>nfr-htp</i> and mention bringing offerings from the tomb of <i>sšm-nfr</i> III (G 5170): (The king's <i>w^cb</i> -priest, priest of Menkaure, overseer of <i>k3</i> -priests <i>pn-mrw</i> , says: as for my brother of my funerary estate, <i>nfr-htp</i> , and those born to him by father (or) mother, they are the <i>k3</i> -priests of (my) funerary estate for the invocation offering in (my) tomb of (my) funerary estate which is the cemetery of <i>3ht-hwfw</i> , 4) as they bring (to me) the reversionary offerings of (my) lord, the vizier <i>sšm-nfr</i> . [As for] the <i>h3</i> of fields which I have given to him and his descendant. I have not empowered any persons to have authority over it, as well as this descendant of his. I have not empowered any son (of mine) there nor any descendant (of mine) to have authority; he shall give <i>t3</i> of <i>s3t</i> -land (read perhaps <i>3ht</i>) as the invocation offerings of the king's acquaintance, <i>mrt-it.s</i>).			

Tomb no. G 5280			
Name: <i>ph-n-ptḥ</i>			
Titles	Scribal: <i>zš^c nzwt</i>		
	Honorific: <i>rḥ-nzwt</i>		
Family-dependants	Probably father	<i>sšm-nfr I</i>	G 4940
	Probably mother	<i>imn-df3.s</i>	
Bibliography PM III, 158. BROVARSKI, 'A Triad for Pehenptah', 261-273. EATON-KRAUSS, 'The Striding Statue of Pehenptah', 305-312. REISNER, <i>Additions</i> , 49.			
Remarks			

Tomb no. G 5482			
Name: <i>ptḥ-iw.f-n</i>			
Titles Relating to palace: <i>hnty-š pr-^c3, šḥd hnty-š pr-^c3</i>			
Family-dependants	Wife	<i>hmt-r^c</i>	<i>rḥt-nzwt</i>
Bibliography PM III, 164			

Remarks

Tomb no. G 4941	
Name: <i>pth-ⁱw.fni</i>	
Titles	Relating to palace: <i>im-r3 is n š pr-³, imy-r3 st hnty-š pr-³</i>
	Relating to pyramid complex: <i>hnty-š mn-nfr ppy</i>
	Religious: <i>w^cb 200</i>
	Honorific: <i>rh-nzwt</i>
	Other: <i>mdhw whrt ³t, smr</i>
Bibliography PM III, 143. BAER, <i>Rank and title</i> , 72 (149). BAUD, <i>Famille Royale</i> , 450 (65).	
Remarks This tomb was inserted into S 984 and its borders are hard to identify. Junker mentioned only one shaft, while Reisner mentioned two.	

Tomb no. <i>pth-spss I</i>			
Name: <i>pth-špss I</i>			
Titles	Religious: <i>shd hm-k3</i>		
Family-dependants	Wife	<i>rdi-n.s</i>	<i>rht nzwt</i>
Bibliography PM III, 151-2.			
Remarks			

Tomb no. G 2361			
Name: <i>m33</i>			
Titles	Other: <i>imy-r3 ššr</i>		
Family-dependants	mentioned	<i>titi</i>	<i>rht-nzwt</i>
Bibliography PM III, 84. REISNER, <i>Additions</i> , 67-8.			
Remarks The name and title of <i>titi</i> were inscribed over a fragment registered in Boston museum expedition records (Field number: 35-9-7d), but they are not mentioned in the documents of Reisner.			

Tomb no. Shaft G 2381 A and chapel G 2386 C1			
Name: <i>mry-r^c-mry-ⁱpth-ⁿh pth-špss impy</i>			

Titles			Relating to vizierate: <i>t3yty z3b t3ty</i>
			Construction: <i>imy-r3 k3t nzwt</i> ,
			Labour: <i>mdh kd nzwt m prwy</i>
			Religious: <i>sm, hry-hbt hry-tp</i> ,
			Other: <i>h3ty-^c, , hrp šndwt nzwt nbt, imy-r3 w^cbty, im3</i> .
Family-dependants	Father	<i>mr-ptḥ-^cnḥ-mry-r^c nḥbw</i>	G 2381
	Brother	<i>z3bw-ptḥ ibbi</i>	Shaft G 2383 C and chapel G 2386 C 2
Bibliography PM III, 91-92. REISNER, <i>sndm-ib</i> , 158-169 STRUDWICK, <i>Administration</i> , 96-7 (62); 130-131 (117).			
Remarks Reisner believed that the owner of chapel G 2386 C1 is <i>impy</i> who was buried in G 2381 A. Shaft G 2381 A is a sloping shaft of type 9 which descends to the west with the entrance east of the serdab of G 2381. PM mentioned that there has been once a stone mastaba which is now destroyed, while Reisner made no mention of a superstructure. The vizieral titles of <i>impy</i> were not discovered in G 2381 A but came from dislocated blocks which might belong to his serdab in G 2386 C1.			

Tomb no. G 2381			
Name: <i>mry-r^c-mry-ptḥ-^cnḥ nḥbw</i>			
Titles	Construction: <i>imy-r3 k3t nbt nt nzwt, imy-r3 k3t</i>		
	Labour: <i>mdh kd nzwt, mdh kd nzwt m prwy, kd nzwt m prwy, mdh nzwt</i> ,		
	Relating to pyramid complex: <i>imy-r3 ḥnty-š mn-nfr-mry-r^c ppy, imy-r3 wpt nzwt mn-nfr-mry-r^c</i>		
	Honorific: <i>smr w^cty, špss nzwt</i>		
	Religious: <i>hry-hbt, hry-hbt hry-tp, sm</i> .		
	Other: <i>imy-r3 kdw, ^c3 dw3w, mty n s3, hrp-šndyt nbt, hry-sšb3 n w^cbty, hry-tp nzwt, smsw snwt</i> .		
Family-dependants	Probably father	<i>hnm-inti</i>	G 2374
	Wife	<i>ḥ3t-k3w</i>	<i>z3t nzwt, rḥt-nzwt</i>
	Sons	<i>tḥm3t</i>	<i>smr-w^cty, mdh nzwt n prwy</i>
		<i>z3bw-ptḥ ibbi</i>	Chapel G 2386 C 2, shaft: maybe G 2381 A or G 2381 C
		<i>mry-r^c-mry-ptḥ-^cnḥ ptḥ-špss impy</i>	Chapel G 2386 C 1, shaft G 2381 A
	Brother	<i>ptḥ-mr-^cnḥ-ppy</i>	<i>hry-hbt</i>
	mentioned	<i>idw</i>	<i>imy-r3 pr</i>
		<i>ikr</i>	<i>imy-r3 sšr</i>

Bibliography PM III, 89-91. REISNER, <i>BMFA</i> 11, 53-66. STRUDWICK, <i>Administration</i> , 113 (90). STRUDWICK, <i>Texts</i> , 265-8 (198).			
Remarks To the same mastaba belongs also the shaft G 2382 A, in which Reisner believed <i>mry-r^c-mry-ptḥ-^cnh nḥbw</i> was buried.			

Tomb no. G 5221			
Name: <i>mmi</i>			
Titles			
Family dependants	Mentioned	<i>iḥy</i>	<i>imy-r³ wpwt</i>
Bibliography PM III, 155.			
Remarks G 5221 is thought to belong to <i>mmi</i> . But since there is also a fragment of an obelisk 14-11-158 (= MFA 21.958) which is inscribed for a certain <i>iḥy</i> , the tomb owner is uncertain.			

Tomb no. G 5530			
Name: <i>mmi</i>			
Titles	Relating to palace: <i>ḥnty-š pr-^c3</i>		
	Religious: <i>ḥm-ntr ḥwfw</i>		
Bibliography PM III, 164. REISNER, <i>Additions</i> , 56 s-u.			
Remarks			

Tomb no. G 2421			
Name: <i>mn-nfr</i>			
Titles	Relating to palace: <i>šḥd ḥnty-š pr-^c3, ḥry-sšt³ pr-^c3, imy-r³ ḥtny-š pr-^c3</i>		
	Relating to expeditions: <i>imy-r³ wpwt</i>		
	Honorific: <i>rḥ-nzwt</i>		
Family-dependants	Wife	<i>ḥknw</i>	<i>rḥt-nzwt</i>
	Mentioned	<i>ḥt-mrwt</i>	
Bibliography PM III, 94. (incorrectly called G 2427?).			

Remarks
 There is a confusion between G 2427 and G 2421 in both PM and GA. PM mentions only G 2427 and states that Hassan calls it G 2421 while GA mentions each tomb separately but assigns both of them to *mn-nfr* and gives the same bibliography for both.

Tomb no. G 5610	
Name: <i>mn-hbw</i>	
Titles	Relating to palace: <i>shd iry md3t pr-md3t ntr pr-ꜥ3</i>
	Religious: <i>hm-ntr hwwf, hm-ntr hr-mddw</i>
	Other: <i>hry-sšt3, hry-sšt3 n hmwt</i>
Bibliography PM III, 168. BAER, <i>Rank and title</i> , 78 (178).	
Remarks	

Tomb no. G 2423			
Name: <i>mhw</i>			
Titles	Legal: <i>z3b iry-Nhn</i>		
	Religious: <i>hm-ntr m3ꜥt</i>		
	Other: <i>hry-sšt3 wdꜥ-mdw, smsw h3yt, shd hry wdbw, wr h3yt</i>		
Family	Wife	<i>hnt</i>	
	Mentioned	<i>iss-nfr</i>	<i>z3b iry-Nhn, hm-ntr, hry-sšt3</i>
Bibliography PM III, 94. REISNER, <i>Cemetery G 2400</i> , 125 q-s.			
Remarks The name and titles of <i>issi-nfr</i> were inscribed on an architrave which was found in shaft G 2423 C and may thus not belong to the tomb.			

Tomb no. G 2461'			
Name: <i>msi</i>			
Titles	Scribal: <i>zS ꜥ pr-ꜥ nzwt hft hr</i>		
Family-dependants	Probably wives	<i>titi</i>	<i>rht-nzwt, hmt-ntr hwt-hr</i>
		<i>sndmt-ib</i>	<i>rht-nzwt, hmt-ntr hwt-hr</i>
Bibliography REISNER, <i>Cemetery 2400</i> , 125 ae.			
Remarks The number G 2461 is used twice by Reisner. This mastaba is called G 2461' here to differentiate it			

from the other similarly numbered. G 2461' is a one shaft mastaba west of G 2378, south of G 2429, and east of G 2423, while G 2461 is an 8 shaft mastaba north of G 2186, west of G 2464, and east of G 2462.

Tomb no. G 2435		
Name: <i>ny-r^c</i>		
Family-dependants	Mentioned	<i>k3k3i-^cnh</i>
Bibliography PM III, 94. REISNER, <i>Cemetery 2400</i> , 125 ae.		
Remarks The name of <i>k3k3i-^cnh</i> was found on a fragment in the chamber of shaft G 2435 X, and thus most probably does not belong to this mastaba.		

Tomb no. S 576	
Name: <i>nfr</i> II	
Titles	Honorific: <i>r^h-nzwt</i>
	Other: <i>imy-r3 pr</i>
Bibliography PM III, 154.	
Remarks	

Tomb no. G 5550, LG 38			
Name: <i>nfr idw</i> I			
Titles	Relating to vizierate: <i>t3ty z3b t3yty</i>		
	Construction: <i>imy-r3 k3t nbt nt nzwt</i>		
	Legal: <i>z3b ^cd-mr</i>		
	Scribal: <i>zš ^c nzwt, imy-r3 zš ^c nzwt</i>		
	Relating to <i>šnwt</i> : <i>imy-r3 šnwt</i>		
	Relating to <i>pr-<u>h</u>d</i> : <i>imy-r3 prwy <u>h</u>d</i>		
	Other: <i>hry-tp nzwt, mdw rhyt, iwn knmwt, imy-r3 hwt-k3, imy-r3 wdwt nbt, imy-r3 izwy nzwt, , imy-r3 gswy, imy-r3 hnw, im-r3 shwt nbwt, imy-r3 pr, hry-sš3 nzwt, imy-r3 w^cbt, imy-r3 w^cbty.</i>		
Family dependants	Wife	<i>hmt-r^c</i>	<i>hmt-ntr nit nbt w3wt</i>
	Sons	<i>idw</i>	? <i>pr-^c3</i>
	Mentioned	<i>k3r</i>	<i>imy-r3 pr, shd hm-k3</i>
		<i>hnm-htp</i>	<i>shd hnty š pr-^c3, imy-r3 iz hnty-š pr-^c3, hm-ntr?</i>
	<i>mrr</i>		

		<i>iri</i>
		<i>mḥw-3ḥti</i>
		<i>fkt</i>
		<i>kwt-b3ḥ</i>
Bibliography PM III, 165. STRUDWICK, <i>Administration</i> , 68-9 (22). BAER, <i>Rank and title</i> , 62 (78).		
Remarks		

Tomb no. G 2185		
Name: <i>nfr.s-ḥfn</i>		
Titles		
Bibliography PM III, 81. REISNER, <i>Additions</i> , 97-9. REISNER, <i>BMFA</i> 36, 27.		
Remarks		

Tomb no. G 2366			
Name: <i>ni-msti</i>			
Titles	Religious : <i>ḥm-ntr nzwt, w^cb nzwt, imy-ḥt ḥm-k3, ḥrp šms</i>		
	Honorific: <i>rḥ-nzwt</i>		
	Other: <i>imy-r3 pr, imy-r3 sšr</i>		
Family dependants	Wife	<i>k3-mrt.s</i>	<i>ḥmt-ntr ḥwt-ḥr, ḥmt-ntr Nt</i>
	Sons	<i>nfr-ḥnt</i>	<i>imy-r3 sšr</i>
		<i>iri-nḥt</i>	<i>zš z3b</i>
Bibliography PM III, 85 REISNER, <i>Additions</i> , 71-2. SIMPSON, <i>Giza Mastabas</i> 4, 32-33.			
Remarks Reisner mistakenly identified the owner of the neighbouring tomb G 2365 as <i>ni-msti</i> and his wife as <i>k3-mrt.s</i> , based on a false door which actually belongs to G 2366.			

Tomb no. S 939-955.	
Name: <i>n-mt.f</i>	
Titles	Religious: <i>imy-r3 ḥmw-k3</i>

Bibliography JUNKER, <i>Giza VII</i> , 32.
Remarks

Tomb no. G 2424-2425
Name: <i>nḥw</i>
Bibliography REISNER, <i>Cemetery G 2400</i> , 125 u.
Remarks

Tomb no. <i>nḥt</i>
Name: <i>nḥt</i>
Bibliography PM III, 163.
Remarks

Tomb no. S 700	
Name: <i>ni-swt-ptḥ</i>	
Titles	Scribal: <i>zš ʿ nzwt ḥft ḥr, zš ʿ nzwt pr-ʿ, zš ʿ nzwt pr-ʿ ḥft ḥr.</i>
Bibliography JUNKER, <i>Giza VIII</i> , 166-168, Abb. 87.	
Remarks	This is a rather small shaft with no substructure. Although the shaft was not found sealed, it contained an intact burial consisting of a wooden coffin with body wrapped in linen. The above name and titles were inscribed on the false door which was found in the rubble of the shaft.

Tomb no. <i>nsw-ḳdw II</i>	
Name: <i>nsw-ḳdw II</i>	
Titles	Relating to palace: <i>imy-r3 ḥnty-š pr-ʿ3, šḥd ḥnty-š pr-ʿ3, imy-r3 wpt pr-ʿ3, imy-r3 st ḥnty-š pr-ʿ3, imy-r3 mdʿ pr-ʿ3, iry-ḥtm pr-ʿ3</i> Other: <i>ḥry-sšt3</i>
Family	Son <i>z3bi</i> <i>ḥnti-š pr-ʿ3</i>
Bibliography PM III, 152.	
Remarks	

Tomb no. G 4970				
Name: <i>nzwt-nfr</i>				
Titles	Legal: <i>z3b hry sšt3</i>			
	Related to palace: <i>imy-r3 ħ</i> .			
	Religious: <i>imy-r3 w^cbw, ħm-ntr ħ^c.f-r^c, ħm-ntr twt ħ^c.f-r^c.</i>			
	Honorific: <i>rh-nzwt</i>			
	Other: <i>imy-r3 mnw t3-wr wd3t, imy-r3 mnnw nzwt ħk3-^cndw i3btt, ħrp m s3, ^cd-mr tnw , ħrp imyw s3, imy-r3 prw mnw nzwt , imy-r3 wpt</i>			
Family-dependants	wife	<i>hnti-(k3)</i>	<i>hmt-nt ħwt-ħr, hmt-ntr Nt, rht-nzwt</i>	
	Sons	<i>k3m-ib</i>	<i>smr, ħrp ħ</i>	
		<i>wr-rwdw</i>	<i>rh-nzwt</i>	
		<i>k3-mħš</i>	<i>rh-nzwt</i>	
		<i>spss-k3</i>	<i>šd wi3</i>	
		<i>k3-wd-^cnh</i>	<i>^cd-mr-tnw</i>	Buried at Dahshur ²
		<i>nfr-m3^ct</i>	<i>rh-nzwt</i>	
		<i>k3-ħr-st.f</i>	<i>zš ^c nzwt</i>	
	Daughters	<i>hnwt-sn</i>	<i>Rht-nzwt</i>	
		<i>mrt-it.s</i>		
		<i>bw-nfr</i>		
		<i>3tt-k3w.s</i>		
		<i>msh^t</i>		
		<i>nfr-ħr-nzwt</i>		
		<i>nb-k3</i>		
		<i>s3t-mrti</i>		
		<i>ni-^cnh-ħwt-ħr</i>		
		Mentioned	<i>k3i</i>	<i>imy-r3 pr</i>
	<i>ini</i>			
	<i>nfr-nn</i>		<i>zš</i>	
	<i>tnti</i>			
	<i>sn-r-ħwi</i>		<i>ii md3wt</i>	
	<i>špri-r-^cnh</i>		<i>ħrp-šħ</i>	
	<i>ii-mw</i>			
	<i>ii-mw</i>		<i>šmsti</i>	
	<i>sni</i>		<i>wdpw</i>	
	<i>iy, in-nb.f, ii-tw3i, mr-ib, ntr-nfr, ^c3t, iii, zš-n-dt.f, in-k3.f</i>		<i>ħk3</i>	
<i>mrky</i>	<i>imy-r3 sšr</i>			
<i>inpw-ħtp</i>	<i>ħtm</i>			
<i>snb</i>	<i>nħsi ħtm</i>			

²

Baud, GM 133, 1993, 10-12; El Khouli, Kanawati, El Hammamiya, 15; Fischer, JAOS 74, 1954, 26-29

	<i>wḏ-ntrw.f</i>	<i>šmsw</i>
	<i>ḳnh-iswi-dd.f-r^c</i>	
	<i>hnm-ḥtp</i>	<i>ḥrp iswt</i>
	<i>ḥkn-dd</i>	<i>Imy-r3 ḥm-k3</i>
	<i>ḥsi</i>	<i>ḥm-k3</i>
	<i>nngi</i>	
	<i>nfr-h3</i>	
	<i>pḥts</i>	
	<i>nzwt</i>	
	<i>k3-ḥ3</i>	
	<i>mtiw:</i>	
	<i>titi</i>	
	<i>tnti</i>	
	<i>s3tw</i>	
	<i>ḥtp-iriii</i>	

Estates: 11 in number

1. *iw mtt*
2. *šndty*
3. *r-t3wy*
4. *s3w dh3w*
5. *grgt idr*
6. *ḥwt k3*
7. *iw rd*
8. *ḥr*
9. *š3 bšt*
10. *šḥt ḥt-ḥr*
11. *ḥtw*

Bibliography

PM III, 143-144.

BAER, *Rank and title*, 69-7 (292).

BAUD, *Famille royale*, 57, 505-6 (135).

BAUD, *GM 133* (1993), 7-18.

BROVARSKI, "An Inventory List from " 149-150, fig. 12c.

CHERPION, *Mastabas*, 114.

KANAWATI, *ACE reports* 18, 31-50.

JÁNOSI, *Abusir and Saqqara in the year 2001*, figs. 1-2.

ROTH, *OKAA*, 2006, 284-285, table 1.

Remarks

Junker mentioned that behind the two false doors of the chapel there are two serdabs, but he did not draw the serdabs on the map. I drew them on my map in the most probable location.

Baer remarked that a scene in this tomb was copied from the mastaba of *ḥtp-sš3t ḥti* (G 5150) which is a particularly clear case since a portion of the original was misunderstood and badly garbled in the copying.

Tomb no. G 2175				
Name: <i>ndw</i>				
Titles	Religious: <i>w^cb nzwt</i>			
	Other: <i>rh-nzwt</i>			
Family-dependants	Wife	<i>tk3t</i>	<i>mitrt</i>	
	Son	<i>mn-k3w-r^c-wsr</i>		
	Daughters	<i>h3p-k3</i>		
		<i>n-k3w-nit</i>		
	Mentioned	<i>hnm-nfr</i>	<i>w^cb nzwt</i>	
		<i>pth-^cnh-ir.s</i>		
		<i>3ht-tfy</i>		
		<i>inyi</i>		
		<i>tnti</i>		
<i>mnnw</i>				
<i>pri</i>				
Bibliography PM III, 80. FISHER, <i>BMFA</i> 11, 22. REISNER, <i>Additions</i> , 85. SMITH, <i>Egyptian Sculpture</i> , 191.				
Remarks <i>Pth-^cnh-ir.s</i> is probably the wife of <i>hnm-nfr</i> .				

Tomb no. G 2420			
Name: <i>ndmw</i>			
Titles	Relating to palace: <i>hnty-s pr-^c3</i>		
	Religious: <i>shd w^cb nzwt, hm-ntr hr-mddw, hm-ntr hr-nb-hr</i>		
Family-dependants	Son	<i>snb</i>	
	Mentioned	<i>hwfw-dd.f</i>	<i>imy-r3 wpwt hnty-s pr-^c3³.</i>
		<i>škp-htp</i>	<i>rht pr-^c3, w^cb nzwt, hm-ntr hwfw, hry-sšt3, hm-ntr hr-mddw, hm-ntr hr-nb-hr.</i>
Bibliography PM III, 93. REISNER, <i>Cemetery 2400</i> , 125.			
Remarks			

Tomb no. G 5270	
Name: <i>r^c-wr I</i>	
Titles	Scribal: <i>zš hryt ^c nzwt, zš nt ^c nzwt, zš ^c n nzwt hft-hr.</i>

³ Reisner (*Cemetery 2400*, 125) read the title: *pr-^c3 imy-r3 wpwt hnty-s* but I found the above arrangement more reasonable. On the reading of the compound titles of *hnty-s pr-^c3* see Goelet, *palace*, 575.

Honorific: <i>rh-nzwt</i>			
Family -dependants	Probably father	<i>sšm-nfr I</i>	G 4940
	Probably mother	<i>imn-df3.s</i>	
	Son	<i>sšm-nfr</i>	<i>z3b imy-r3 zš</i>
Bibliography PM III, 158. BAER, <i>Rank and title</i> , 97 (297). REISNER, <i>Additions</i> , 48.			
Remarks Junker remarked that this mastaba shows similarities with G 5280 in construction and material. This agrees with the assumption that <i>ph-n-ph</i> , the owner of G 5280 is the brother of <i>r^c-wr I</i> .			

Tomb no. G 5470			
Name: <i>r^c-wr II</i>			
Titles	Legal: <i>z3b ^cd-mr, hry-sšt3 n mdw št3 n hwt-wrt.</i>		
	Religious: <i>hm-ntr m3^ct</i>		
	Other: <i>wr md^c šm^cw</i>		
Family-dependants	Probably father	<i>sšm-nfr II</i>	G 5080
	Probably mother	<i>hnwt-sn</i>	
Bibliography PM III, 162-3. BAER, <i>Rank and title</i> , 98 (298). REISNER, <i>Additions</i> , 55 a.			
Remarks A sealing of Djedkare was found in the shaft and a graffito date was attested in the serdab: year of the 11 th count, 3 rd month of winter, (3 rd day?).			

Tomb no. G 2362			
Name: <i>rwd</i>			
Titles	Religious: <i>imy-ht hm-k3</i>		
	Scribal: <i>zš n s3, imy-r3 zš</i>		
	Other: <i>dt.f</i>		
Family-dependants	Son	<i>hnm-hnw</i>	
	Mentioned	<i>mhi</i>	<i>imy-r3 k3t nbt nt nzwt</i>
		<i>hwi-hnwm</i>	
		<i>ik3w-hr-mrwt</i>	
Bibliography PM III, 84.			

REISNER, <i>Additions</i> , 68.
<p>Remarks</p> <p>The above mentioned titles of <i>rwd</i> come from limestone fragments in MFA Expedition Register (13.4334a, 13.4334b, 13.4334c), but were not mentioned in the records of Reisner in the context of the publication of the tomb. The same fragments carry the name and title of <i>mhi</i>.</p>

Tomb no. G 5032		
Name: <i>rdi-ns</i>		
Titles	Scribal: <i>zš</i>	
	Religious: <i>w^cb nzw</i>	
	Honorific: <i>rh-nzw</i>	
Family-dependants	Wife	<i>mrt-it.s</i>
	Sons	<i>r^c-hw.f</i>
		<i>hnmw-hsi.f</i>
<p>Bibliography</p> <p>PM III, 145.</p> <p>BRUNNER, <i>Hieroglyphische Chrestomathie</i>, 3.</p> <p>MANUELIAN, 'Redi-nes', 55–78.</p> <p>SCHÄFER, <i>Principles of Egyptian Art</i>, 205</p> <p>SMITH, <i>Egyptian Sculpture</i>, 190.</p> <p>WRESZINSKI, <i>Gräber des Alten Reiches</i>, 39.</p>		
<p>Remarks</p> <p>The false door of <i>rdi-ns</i> contains a unique frontal view figure executed in sunk relief with raised interior elements. Smith and Schäfer interpreted that figure as a substitute or a cheap imitation of a statue for the owner. Since the representation of this figure is remarkable in many features, Manuilian considered it an experiment in frontality which was discontinued as a representation technique.</p>		

Tomb no. G 2392			
Name: <i>rdi-n-k3</i>			
Titles	Legal: <i>z3b</i>		
	Scribal: <i>shd zš</i>		
Family-dependants	Mentioned	<i>iwfi</i>	<i>rh-nzw</i>
<p>Bibliography</p> <p>REISNER, <i>sndm-ib</i>, 182b-182c.</p>			
<p>Remarks</p> <p>This is a badly denuded mastaba with no inscriptions. The names and titles came from fragments of a false door found in shaft G 2392 D. The attribution is thus weak.</p>			

Tomb no. G 2352

Name: <i>ḥ3gi</i>			
Titles	Religious: <i>w^cb</i> , <i>ḥm-ntr ḥrwy nbw</i>		
	Other: <i>rh-nzwt</i> , <i>ḥk3-ḥwt issi</i> , <i>imy-r3 shwt ḥwfw</i> , <i>imy-r3 sšrt nt 3ḥt ḥwfw</i> , <i>imy-r3 iḥw</i>		
Family – dependants	Mentioned	<i>ni-k3-ḥb</i>	<i>ḥm-ntr ḥwfw</i> , <i>ḥnt 3ḥt ḥwfw</i> , <i>rh-nzwt</i> .
		<i>ii-tntt</i>	<i>ḥmt-ntr ḥwt-ḥr nbt nht</i> , <i>ḥmt-ntr Nt mḥyt inb</i>
Bibliography PM III, 84. SIMPSON, <i>Giza IV</i> , 33-35. BAER, <i>Rank and title</i> , 103 (327).			
Remarks <i>ii-tntt</i> is the wife of <i>ni-k3-ḥb</i> .			

Tomb no. G 5540			
Name: <i>ḥ3m-k3</i>			
Titles	Relating to palace: <i>shd ḥnty-š pr-^c3</i> , <i>ḥry-pr pr-^c3</i>		
	Religious: <i>ḥm-ntr mddw-ḥr</i> , <i>ḥm-ntr ḥwfw</i> , <i>ḥm-ntr ḥrwy nbw</i>		
	Other: <i>ḥry-sšt3</i>		
Family - dependants	Wife	<i>nbw-^cnh</i>	<i>ḥmt-ntr ḥwt-ḥr</i> , <i>rh-nzwt</i>
	Mentioned	<i>....^cnh</i>	<i>shd ḥm-k3</i>
		<i>ḥw-n-r^c</i>	<i>ḥm-k3</i>
		<i>bb-ib</i>	<i>shd ḥm-k3</i>
		<i>^cnh-m^c-ḥr</i>	<i>ḥm-k3</i>
		<i>inti</i>	<i>ḥm-k3</i>
		<i>ḥmtnw</i>	<i>ḥm-k3</i>
<i>mr-ptḥ</i>	<i>shd ḥm-k3</i>		
Bibliography Baer, <i>Rank and title</i> , 103, (325). JUNKER, <i>Giza VII</i> , 253-4, Abb. 108. REISNER, <i>Additions</i> , 56 v-x.			
Remarks This tomb was excavated by Reisner, who found in it several limestone fragments including two architraves for <i>nbw-^cnh</i> and <i>mr-ptḥ</i> . The name of the owner <i>ḥ3m-k3i</i> was found in the chapel. An architrave for a person with the same name <i>ḥ3m-k3i</i> was found by Junker, obviously not far from this mastaba, but was not attributed to a particular tomb. The architrave which is now kept in Vienna belongs almost certainly to the owner of this tomb because of the mention of <i>nbw-^cnh</i> as his wife on the architrave as well. The above titles of <i>ḥ3m-k3i</i> were mentioned on that architrave.			

Tomb no. G 5554, G 2357.	
Name: <i>ḥy</i>	
Titles	Religious: <i>imy-ḥt ḥm-k3</i>
	Other: <i>imy-r3 sšr</i> , <i>imy-r3 pr</i> , <i>ḥk3 ḥwt</i> , , <i>ḥk3</i>

Family-dependants	Mentioned	<i>sndm-ib</i>	<i>iry-p^ct, ḥ3ty-^c, t^cty z3b t3ty, imy-r3 k3t nbt nt nzwt, imy-r3 ḥwt-wr 9, imy-r3 prwy-ḥd.</i>	G 2370 or G 2378
Bibliography REISNER, <i>Additions</i> , 56 z-aa.				
Remarks <i>ḥy</i> was obviously in the service of <i>sndm-ib (inti qr mḥi)</i> . The north stela of <i>ḥy</i> has the same division of register like that of <i>nḥbw</i> G 2381.				

Tomb no. G 2353				
Name: <i>ḥrw-nfr</i>				
Titles	Religious: <i>ḥm-ntr ḥwfw</i>			
Family-dependant s	Wife	<i>ndt-pt</i>	<i>ḥmt-ntr ḥwt-ḥr, rḥt-nzwt</i>	
	Son	<i>ḥwfw-ḥtp</i>	<i>rḥ-nzwt, w^cb nzwt</i>	
	Mentioned	<i>wsr</i>	<i>ḥry-tp nzwt pr-^c3, imy-r3 ḥnw</i>	
Bibliography PM II, 84. REISNER, <i>Additions</i> , 61-2. SIMPSON, <i>Giza IV</i> , 35-37.				
Remarks The monolithic stela of G 2353 might have originally stood at the entrance to the chapel of G 2352 and was removed later to its present position when G 2353 was built. In this case the decoration might have been in the name of <i>ḥ3gi</i> , or his son. Therefore it is impossible to say whether <i>ḥwfw-ḥtp</i> was a son or a grandson of <i>ḥ3gi</i>				

Tomb no. G 5480, G 2340, LG 29				
Name: <i>ḥti</i> or <i>s3tw</i> ?				
Titles of <i>ḥti</i>	Legal: <i>z3b</i>			
	Scribal: <i>imy-r3 zš</i>			
Family-dependants of <i>ḥti</i>	Probably mother	<i>mr.s-^cnḥ</i>	<i>rḥt-nzwt</i>	
	Sister	<i>ḥnwt</i>	<i>rḥ-nzwt</i>	
Bibliography PM III, 163. REISNER, <i>Additions</i> , 56 a.				
Remarks There is a confusion concerning the name of the owner of this mastaba whether it is <i>ḥti</i> or <i>s3tw</i> . The name <i>ḥti</i> occurs on several statues found in the serdab of this tomb. Although Junker states clearly that all the spaces of the mastaba where the name of the owner would be expected are destroyed, he claimed that the name <i>s3tw</i> has been seen by Reisner, who in turn wrote the name of Junker between brackets when he mentioned the later name of the owner. Obviously each scholar believed that the name had been seen by his colleague.				

Tomb no. <i>ḥtpi</i>	
Name: <i>ḥtpi</i>	
Titles	Relating to palace: <i>ḥnty-š pr-ꜥ3, šḥd ḥnty-š pr-ꜥ3</i>
Bibliography PM III, 143. CURTO, <i>El-Ghiza</i> , 67.	
Remarks Junker suggested that this double mastaba is actually two mastabas very near to each other. The southern one (886/926) was built by <i>ḥtpi</i> and the northern one (929, 931) was built probably by his son.	

Tomb no. G 5380, G 2330	
Name: <i>ḥtpy</i>	
Titles	Religious: <i>ḥry-ḥbt</i> Honorific: <i>smr-wꜥty</i>
Bibliography REISNER, <i>ASAE</i> 13, 227-252. REISNER, <i>Additions</i> , 52.	
Remarks	

Tomb no. G 2430, LG 25			
Name: <i>ḥtp-n-ptḥ</i>			
Titles	Relating to palace: <i>ḥrp ꜥḥ</i>		
	Honorific: <i>rḥ-nzwt</i>		
	Other: <i>imy-r3 ḥntyw-š</i>		
Family-dependants	Wife	<i>ḥꜥ-mrr-nbti</i>	<i>ḥmt-ntr ḥwt-ḥr m swt.s nbt.</i>
Bibliography PM III, 94. BADAWY, <i>Nyhetep-Ptah</i> , 1-10, pls. 1-17 REISNER, <i>Cemetery 2400</i> , 125 z.			
Remarks			

Tomb no. G 2350, G 5290.			
Name: <i>ḥtp-n-ptḥ</i>			
Family-dependants	Mentioned	<i>ptḥ-ḥtp</i>	<i>ḥnt-š pr-ꜥ3, rḥ-nzwt, wꜥb nzwt</i>
Bibliography PM III, 158. BAER, <i>Rank and title</i> , 107 (355).			

Remarks

Tomb no. G 2410
Name: *ḥtp-k3w*
Bibliography
REISNER, *Cemetery G 2400*, 121 a.
Remarks
Reisner mentioned that the stela and door jambs were decorated but did not give any details about the inscriptions, other than the owner's name.

Tomb no. G 2336
Name: *ḥw-ptḥ*
Titles
Family Son *ḥw-ptḥ* *imy-r3 pr*
Bibliography
PM III, 83.
REISNER, *Additions*, 56 c-d.
Remarks
This mastaba forms a complex with G 2335. The name of the owner and his son were recovered from a block found in the debris behind the east face of the mastaba, and thus the attribution is weak.

Tomb no. *ḥwfw-snb I*
Name: *ḥwfw-snb I*
Titles Religious: *ḥm-ntr ?*, *ḥm-ntr mdd-r-nbty*
 Other: *ḥry-sšt3 nb.f*, *imy-r3 ipt-nzwt*
Bibliography
PM III, 152-3.
Remarks

Tomb no. *ḥwfw-snb II*
Name: *ḥwfw-snb II*
Titles Religious: *ḥm-ntr ḥwfw*, *ḥm-ntr ḥr-mddw*
 Relating to palace: *shd ḥnty-š pr-3^c*, *imy-r3 ḥnty-š pr-3^c*
Family- Probably father *ḥwfw-snb I*
dependant
s
Bibliography
PM III, 153.
Remarks

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Tomb no. <i>ḥwfw-dd.f-ḥnh</i>	
Name: <i>ḥwfw-dd.f-ḥnh</i>	
Titles	Relating to palace: <i>šḥd ḥnty-š pr-ḥ3, imy-r3 st nt ḥnty-š pr-ḥ3</i>
Bibliography PM III, 160.	
Remarks	

Tomb no. G 5210, LG 43				
Name: <i>ḥm-tn</i>				
Titles	Religious : <i>imy-r3 ḥmw-k3, wḥb nzwt, ḥm-ntr ḥwfw</i>			
	Honorific: <i>rḥ-nzwt</i>			
	Other: <i>imy-r3 pr n iry-pḥt z3 nzwt k3-wḥb, imy-r3 pr n z3 nzwt dw3-n-rḥ, imy-r3 pr n ḥmt-nzwt z3t nzwt ḥtp-ḥr.s, imy-r3 pr n wrt ḥst z3t nzwt mr.s-ḥnh,</i>			
Family-dependants	Son	<i>ḥm-tn-nds</i>	<i>imy-r3 pr, imy-r3 ḥmw-k3, zš</i>	
	Mentioned	<i>k3-wḥb</i>	<i>Iry-pḥt z3 nzwt</i>	G 7110
		<i>ḥtp-ḥr.s</i>	<i>ḥmt nzwt, s3t nzwt</i>	G7110, G7350
		<i>mr.s-ḥnh</i>	<i>wrt ḥts s3t nzwt</i>	G7530-7540
		<i>dw3-n-rḥ</i>	<i>s3 nzwt</i>	G 5110
Bibliography PM III, 155. BAER, <i>Rank and title</i> , 115 (386). BAUD, <i>Famille Royale</i> , 542-4 (118). REISNER, <i>Additions</i> , 15. SMITH, <i>ZÄS</i> 71, 141.				
Remarks From the titles it is clear that <i>ḥm-nw</i> served many members of the royal family: <i>k3-wḥb, dw3-n-rḥ, ḥtp-ḥr.s, mr.s-ḥnh</i> . He and his son <i>ḥm-tn-nds</i> were also mentioned in the mastaba of <i>mr.s-ḥnh</i> III (G7530-40).				

Tomb no. <i>ḥnit</i>			
Name: <i>ḥnit</i>			
Titles	Religious: <i>ḥmt-ntr ḥwt-ḥr</i>		
	Honorific: <i>rḥt-nzwt</i>		
Family-dependants	Son	<i>issi-b3.f</i>	<i>ḥry-ḥbt</i> (also in G 2370)
Bibliography PM III, 162.			
Remarks A fragment of this mastaba was discovered in the architrave of the mastaba of <i>d3ty</i> . The head of a			

limestone statue of *ḥti*, whose mastaba lies to the east, was discovered in this tomb.

Tomb no. G 2374			
Name: <i>ḥnm-inti</i>			
Titles	Relating to vizierate: <i>t3yty z3b t3ty</i> .		
	Legal: <i>imy-r3 ḥwt-wrt 6</i> .		
	Scribal: <i>imy-r3 zšw ʿ nzwt</i> .		
	Construction: <i>imy-r3 k3t nbt, imy-r3 k3t nbt nt nzwt</i> .		
	Labor: <i>mdḥ kd nzwt m prwy</i>		
	Relating to <i>šnwt</i> : <i>imy-r3 šnwty</i>		
	Relating to <i>pr-ḥd</i> : <i>imy-r3 prwy ḥd</i>		
	Honorific: <i>smr wʿty, iry-pʿt</i>		
	Pyramid: <i>šḥd ḥmw-ntr dd-swt-tti</i> .		
	Other: <i>ḥ3ty-ʿ3, iwn knmwt, imy-ib nzwt, imy-ib nzwt m k3t.f nbt, imy-r3 wʿbty, imy-r3 prwy nwb, mdw rḥyt, ḥry-sšt3 n wdt-mdw nbt nt nzwt, ḥry-sšt3 n nzwt, ḥry-tp nzwt</i> .		
Family-dependants	Father	<i>sndm-ib-inti</i>	G 2370
	Mother	<i>tḥi</i>	
	Son	<i>ni-(ʿnh-ḥrty)</i>	<i>z3b</i>
	Mentioned	<i>k3i</i>	
		<i>mn-iḥi</i>	
<p>Estates: 18 in number, the names surviving are:</p> <ol style="list-style-type: none"> 1. <i>mr ḥrty ʿnh tti</i> 2. <i>mr ḥnm ʿnh tti</i> 3. <i>šḥtp pḥ tti</i> 4. <i>mn dḥ3 tti</i> 5. <i>kbt tti</i> 6. <i>mr wh ʿnh tti</i> 7. <i>sʿnh pḥ tti</i> 8. <i>šḥtpw tti</i> 9. <i>sʿnh wh wnis</i> 10. <i>ḥnty b3 wnis</i> 11. <i>nfr ḥʿw wnis</i> 12. <i>šḥtp pḥ wnis</i> 13. <i>mr wh ʿnh wnis</i> 			
<p>Bibliography</p> <p>PM III, 87.</p> <p>Baer, <i>Rank and title</i>, 118 (402).</p> <p>BROVARSKI, <i>Giza VII</i>, 115-130.</p> <p>STRUDWICK, <i>Administration</i>, 128 (113)</p>			
<p>Remarks</p> <p>The name and title of the son <i>ni-(ʿnh-irty)</i> were reconstructed by Brovarski, based on very slight remains of reliefs. Reisner believed that <i>ḥnm-inti</i> is buried in G 2385 A.</p>			

Tomb no. G 2191	
Name: <i>hnmw</i>	
Titles	Relating to palace: ? <i>pr-ʕ3</i> .
	Other: <i>hry-sšt3 n kkw ?</i> .
Bibliography PM III, 81. REISNER, <i>Additions</i> , 103.	
Remarks	

Tomb no. G 5370, LG 31	
Name: <i>d3ty</i>	
Titles	Construction: <i>imy-r3 k3t nbt nt nzwt</i> .
	Other: <i>wr mdʕ šmʕw</i> .
Bibliography PM III, 161. BAER, <i>Rank and title</i> , 156 (589). REISNER, <i>Additions</i> , 51. STRUDWICK, <i>Administration</i> , 164 (164).	
Remarks A wooden chest bearing seals of lector priests of Sahure and Neferirkare was discovered displaced west of the false door. It is possible that its original location was in one of the shafts and it was brought there by tomb robbers.	

Tomb no. <i>hnt-k3w.s</i>			
Name: <i>hnt-k3w.s</i>			
Titles	Religious: <i>hnt-ntr hwt-hr nbt iwnt</i>		
	Honorific: <i>rht-nzwt</i>		
Family-dependants	Probably father	<i>isw</i>	<i>imy-r3 wpwt</i>
	Mentioned	<i>K3-nfr</i> (probably son)	<i>imy-r3 hm-k3</i>
		<i>dw3-rʕ</i>	<i>hm-k3</i>
		<i>wt-k3</i>	
		<i>k3-nb.f</i>	
		<i>sh̄m-k3</i>	
		<i>ii-ky</i>	
		<i>wr-k3</i>	
Bibliography PM III, 148-9. REISNER, <i>Appendix A</i> , 27. SMITH, <i>AJA</i> 46, 531.			

Remarks
 This mastaba had no core but consists of a three roomed exterior chapel of stone. Enough remains to identify this chapel with that described by Ballerini from which Schiahporelli removed a false door , now Turin 1854. Reisner believed that this false door must have stood to the south end of the west wall of the inner room, and adjoining it on the north are still the remains of a pictorial list of offerings and a procession of funerary priests mentioned by Ballerini. Also a fragment of an offering bearer probably from this wall mentions a *k3-nfr* who is probably the same as the son named on the false door. Finally a badly preserved drum, from the entrance is inscribed with the above mentioned name and title of the owner.

Tomb no. G 5562, G 2347 X.			
Name: <i>s-n-3ht s-n-ht</i>			
titles	Religious: <i>hm-k3, imy-r3 wpt hm-k3</i>		
	Other: <i>imy-r3 sšr, hrp šms</i>		
Family-dependants	mentioned	anaymous	<i>iry-p^ct, ḥ^cty-^c, t3yty z3b t3ty, imy-r3 Zš^c nzwt, imy-r3 k3t nbt nzwt, hry-tp nzwt, mdḥ nzwt m prwy.</i>
Bibliography REISNER, <i>Additions</i> , 56 ac.			
Remarks The above name and titles were found on several fragments of an architrave in shaft G 5562 A. Since the face of the stone of this piece was covered with plaster as if reused, the identification of the tomb owner is weak.			

Tomb no. Shaft G 2381 C and chapel G 2386 C 2			
Name: <i>z3bw-ptḥ ibbi</i>			
Titles	Relating to vizierate: <i>t3yty z3b t3ty</i>		
	Construction: <i>imy-r3 k3t nzwt,</i>		
	Labour: <i>mdḥ kd nzwt m prwy</i>		
	Scribal: <i>zš md3t ntr, imy-r3 zš prwy</i>		
	Pyramid: <i>imy-r3 nwt-(pyramid).</i>		
	Religious: <i>hry-ḥb, sm shm swdwt nb</i>		
	Honorific: <i>sm-w^cty</i>		
	Other titles: <i>imy-r3 w^cbty, ḥ3ty-^c.</i>		
Family	Father	<i>nḥbw</i> G 2381	
	Brother	<i>impy</i> shaft G 2381 A and chapel G 2386 C1	
Bibliography PM III, 91-92. REISNER, <i>sndm-ib</i> , 173. STRUDWICK, <i>Administration</i> , 96-7 (62); 130-131 (117).			
Remarks The above titles come from three sources: the tomb of <i>ibbi</i> 's father (G 2381), the burial shaft of his brother (G2381 A) and several scattered blocks which are believed to come from his serdab (G2386 C2). Reisner originally assigned the number G 2386 to the middle part of G 2385 and afterwards discarded it . For ease of reference, Brovarski gave the numbers G 2386 a and b to two chapels built			

between G 2384 and the ramp. These two chapels were renamed here G 2386 C1 and G2386 C2 in accordance with the numbering system in the present research. The names of the two persons occur in G 2381 and G 2381 A which suggests that they were sons of the owner of G 2381 although their parents are not mentioned in their chapels.

Reisner believed that *ibbi* was buried in the sloping shaft G 2381 C, though no objects were found there to justify this identification. The name and titles of *impy* were found rather on the coffin of his brother *impy* in shaft G 2381 A.

Tomb no. G 5520, G 2342, LG 28			
Name: <i>s^cnh-ptḥ</i>			
Titles	Scribal: <i>z3b imy-r3 zš, šḥd zš.</i>		
	Legal: <i>z3b ḥd-mr</i>		
	Construction: <i>imy-r3 k3t nt nzwt</i>		
	Religious: <i>ḥm-ntr m3^ct</i>		
Family-dependants	Wife	<i>ḥnit</i>	<i>rḥt-nzwt</i>
	Mentioned	<i>nfr</i>	<i>z3b</i>
Bibliography PM III, 164. REISNER, <i>Additions</i> , 56 m.			
Remarks Lepsius saw remains of reliefs in this mastaba, but by the time Reinsner excavated it, there were no traces of decoration at all. Some of the titles of the owner and the name of his wife were obtained from a fragment which was found in debris over G 5564, but might have originated from G 5520.			

Tomb no. <i>snfrw-nfr</i>	
Name: <i>snfrw-nfr</i>	
Titles	Relating to palace: <i>shd n hsw pr-ꜣ</i>
	Honorific: <i>rh-nzwt</i>
	Other: <i>imy-r3 shmh</i>
Bibliography PM III, 145-6. BAER, <i>Rank and title</i> , 124 (447).	
Remarks There are another two persons named <i>snfrw-nfr</i> in Saqqara with similar titles, owners of tombs E6 and E7. <i>snfrw-nfr</i> of Giza might be one of these two men.	

Tomb no. G 2384	
Name: (<i>snd</i>) <i>m-ib</i>	
Titles	Construction: <i>imy-r3 k3t nbt nt nzwt</i>
	Other: <i>smr</i>
Bibliography PM III, 92. BROVARSKI, <i>Giza VII</i> , 30. REISNER, <i>Giza I</i> , 172	
Remarks Reisner first applied the number G 2384 to the area east of G 2381, which contained G 2390, then later decided that the area “proved not to be a mastaba” and reassigned the number G 2384 to the mastaba on the eastern side of the platform of the <i>sndm-ib</i> complex between G 2386 and G 2385. G 2384 is nearly totally destroyed but Brovarski assigned to it a loose stone with a fragmentary biographical inscription that may derive from its facade ⁴ . The name of the owner of the inscription seems to be <i>sndm-ib</i> , although only the end of the name survives. The above mentioned titles were found on an ointment tablet. Brovarski then suggested that the owner might be the same named son of <i>sndm-ib mhi</i> (G 2378). No burial place remains for the owner of G 2384. Reisner makes mention of a square “well” located within the confines of G 2384, but Brovarski remarks that this well, like the masonry wall enclosing it, rested directly on the pavement of the platform and lacked any indication of a burial. It may, in fact, have been the serdab of G 2384.	

Tomb no. G 2364		
Name: <i>sndm-ib iny</i>		
Titles	Scribal: <i>zš ꜣ nzwt hft hr</i>	
	Religious : <i>hm-k3</i>	
	Other: <i>hrss n s3 pn</i>	
Family-	Wife	<i>kdt-ns</i>

⁴ The block is to be published in Brovarski, The Senedjemib complex pt. 2.

dependants	Daughter	<i>tnft</i>
		<i>d3ty</i>
		<i>dni</i>
		<i>wsr</i>
		<i>kdt-ns</i>
Bibliography REISNER, <i>Additions</i> , 69.		
Remarks		

Tomb no. G 2370, LG 27				
Name: <i>sndm-ib inti</i>				
Titles	Relating to vizierate: <i>t3yty z3b t3ty</i>			
	Legal: <i>z3b ʿd mr</i>			
	Scribal: <i>imy-r3 zš ʿ nzwt, hrp zšw</i>			
	Construction: <i>, imy-r3 k3t-nbt nt nzwt</i>			
	Labour: <i>mdh kd nzwt m prwy</i>			
	Relating to <i>šnwt</i> : <i>imy-r3 šnwt</i>			
	Relating to <i>pr-hd</i> : <i>imy-r3 prwy-hd</i>			
	Honorific: <i>smr-wʿty, iry-pʿt</i>			
	Religious: <i>hry-hbt, hry-tp nzwt</i>			
	Other: <i>imy-r3 is nzwt, imy-r3 prw msw nzwt, imy-r3 hwwt wrwt ssw, imy-r3 hkr nzwt, imy-r3 st nbt nt hnw, h3ty-ʿ, hry-sšt3 n wdt-mdw nbt nt nzwt</i>			
Family-dependants	Wife	<i>tft</i>	<i>rht-nzwt</i>	
	Sons	<i>sndm-ib mhi</i>	G 2378	
		<i>hnm-inti</i>	G 2374	
		<i>ni-ʿnh-mn</i>	<i>shd hmw-k3 hbt</i>	
		<i>ftk-(ti)</i>	<i>zš ʿ nzwt n hft-hr</i>	Probably G 5560
	Mentioned	<i>i3mw</i>	<i>imy-ht hmw-k3, imy-r3 zšw</i>	
		<i>iry</i>	<i>zš pr-md3t ntr</i>	
		<i>ihy</i>	<i>hm-k3, imy-r3 zšw 3h wt</i>	
		<i>ihy</i>	<i>hrp sh</i>	
		<i>ihy</i>	<i>hm-k3</i>	
		<i>issi-b3.f</i>	<i>hry-hbt (also in mastaba of hnit)</i>	
		<i>ʿnh-mntt:</i>	<i>shd hmw-k3</i>	
		<i>wr-ti</i>	<i>z3b, hm-k3</i>	
		<i>mʿ-m:</i>	<i>hrp stw nwb, imy-ht hmw-k3</i>	
		<i>ni-ʿnh-inpw</i>	<i>shd hm-k3</i>	
		<i>nfr-hr-n-pt</i>	<i>imy-ht hmw-k3</i>	
		<i>nfr-sšm-sš3t</i>	<i>z3b imy-r3 zšw</i>	
		<i>nkn</i>	<i>shd hmw-k3</i>	
		<i>ndm</i>	<i>hrp-srw</i>	

	<i>is-n-ptḥ</i>	<i>z3b smsw h3yt</i>	
	<i>ḥm-3ḥty</i>	<i>z3b šḥd zš ḥmw-k3</i>	
	<i>sndm</i>	<i>zš ᶜ nzwt m ḥft ḥr</i>	Probably G 2364
	<i>k3r</i>	<i>sn dt.f, ḥm-k3</i>	
	<i>k3-m-tntt</i>	<i>zš md3t ntr, ḥm-k3</i>	
	<i>tsw</i>	<i>sn dt.f, ḥm-k3</i>	
	<i>ibbi</i>		
	<i>nb-rᶜ</i>		
	<i>rwd-k3</i>		
	<i>ny-ptḥ</i>		

Estates: 36 in number, the names surviving are:

1. *ḥwt,,,mr ntrw*
2. *nfr ḥb,,,*
3. *mr----ᶜnh-issi---*
4. *---ini*
5. *ḥwt ik3w-ḥr sᶜnh----ik3w-ḥr*
6. *nfr nḥrw issi*
7. *mtn ini*
8. *mns3 dd-k3-rᶜ*
9. *ḥwt issi*
10. *sᶜnh sš3t issi*
11. *ᶜnh issi*
12. *ḥnty k3 issi*
13. *nfr ḥᶜw*
14. *ḥwt-k3 sndm-ib*
15. *ḥwt k3-k3i*
16. *---issi*
17. *---w3s n issi*
18. *w3ḥ ik3w-ḥr*
19. *ḥtpt ini*
20. *,,,k3,,,*
21. *ḥwt-issi irwt issi*
22. *ḥwt-issi mr b3stt ᶜnh issi*
23. *----s3ḥw-rᶜ--*
24. *--wsr-k3.f-----*
25. *ḥwt issi srwd ḥr issi*
26. *ḥtpwt issi*
27. *mr ᶜnh issi*
28. *srwd*

Bibliography

PM III, 85-87, 229.

BAER, *Rank and title*, 126 (455)

BAUD, *Famille royale*, 573 (215)

BROVARSKI, *Giza VII*, 37-88.

STRUDWICK, *Administration*, 132-3 (120).

Remarks

sndm-ib inti received several letters from King Isesi which were engraved on the walls of his tomb. He also had another rock cut tomb to the west of the pyramid of Khafre (LG 10).

Tomb no. G 2378, LG 26			
Name: <i>sndm-ib mḥi</i>			
Titles	Relating to vizierate: <i>t3yty z3b t3ty</i>		
	Scribal: <i>imy-r3 zšw r̄ nzwt</i>		
	Construction: <i>imy-r3 k3t nbt nt nzwt</i>		
	Labour: <i>mdḥ ḳd nzwt m prwy</i>		
	Relating to šnwt: <i>imy-r3 šnwt</i>		
	Honorific: <i>smr w̄ty, iry-p̄t</i>		
	Other: <i>iwn knmwt, imy-ib n nzwt, imy-ib nzwt n st.f nb, imy-r3 w̄bty, imy-r3 prwy r̄h3w, imy-r3 prwy nwb, imy-r3 sšr nzwt, ḥ̄ty-̄ m̄3, ḥry-sšt3 n wdt-mdw nbt nt nzwt, , im3ḥw ḥr dd-k3-r̄, im3ḥw ḥr wnīs, ḥry-tp nzwt</i>		
Family-dependants	Father	<i>sndm-ib inti</i>	G 2370
	Mother	<i>tḥi</i>	
	Wife	<i>ḥnti-k3w.s</i>	<i>s3t nzwt n ḥt.f, ḥmt-ntr ḥwt-ḥr nbt nht</i>
	Son	<i>sndm-ib</i>	<i>ḥry-tp nzwt, ḥry-tp nzwt m prwy, mdḥ ḳd nzwt, mdḥ ḳd nzwt m prwy</i>
		<i>mḥi</i>	
	Daughter	<i>ḥnt-k3w.s</i>	
	Mentioned	<i>fifi</i>	<i>imy-r3 bdyw</i>
		<i>ḥm-3ḥty⁵</i>	<i>z3b zš, z3b imy-r3 zšw</i>
		<i>pth-špss</i>	
		<i>ḥwfw-̄nḥ</i>	
<i>ḥnm-b3-špss</i>			
<i>sndm-ib</i>			
	<i>ḳ3r</i>		
Estates: 24 in number, the names surviving are:			
<ol style="list-style-type: none"> 1. <i>ḥr,,,</i> 2. <i>ḥ̄ f3w,,,</i> 3. <i>mr ḥḳ3 r̄nḥ issi</i> 4. <i>š,,,</i> 5. <i>,,,issi,,,</i> 6. <i>Mr sš3t ik3w-ḥr</i> 7. <i>w3ḥ,,,</i> 8. <i>t,,,k3k3i</i> 9. <i>w3ḥ k3k3i</i> 10. <i>mrwt s3ḥw-r̄</i> 11. <i>,,,ḥwt,,mr pth r̄nḥ</i> 12. <i>ḥwt,,,mnt</i> 13. <i>mr r̄ r̄nḥ</i> 14. <i>,,,,wt,,,</i> 15. <i>r̄nḥ,,,,,</i> 16. <i>r̄ r̄□..</i> 			

⁵ Also mentioned in tomb of *sndm-ib inti* G 2370

<p>Bibliography PM III, 87-89. BAER, <i>Rank and title</i>, 126 (456, 456A) BROVARSKI, <i>Giza Mastabas 7</i>, 133-160. BAUD, <i>Famille Royale</i>, 555 (189), 573-4 (216). KANAWATI, <i>Administration</i>, no. 294.(216). SCHMITZ, <i>Königsson</i>, 119 (123)</p>
<p>Remarks</p>

<p>Tomb no. S 660-661, LG 33?</p>	
<p>Name: <i>šm-ḥw-pth</i></p>	
<p>Titles</p>	<p>Scribal: <i>zš n s3 ḥmw-k3, n dt sndm-ib zš n s3</i></p>
	<p>Religious: <i>ḥm-k3</i>.</p>
	<p>Other: <i>imy-r3 pr</i>.</p>
<p>Bibliography PM III, 163. L. D. Text I, 61</p>	
<p>Remarks This is perhaps the same mastaba Lepsius numbered LG 33, from which came a relief fragment containing the name and titles of the deceased. The owner of LG 33 was obviously in the service of <i>sndm-ib</i> family.</p>	

<p>Tomb no. G 2360, G 5490 or G 5390</p>	
<p>Name: <i>šm-k3</i></p>	
<p>Titles</p>	<p>Legal: <i>z3b ḥd-mr</i></p>
	<p>Other: <i>hry-tp nzwt</i></p>
<p>Bibliography BAER, <i>Rank and title</i>, 130 (470). REISNER AND FISHER, <i>ASAE</i> 13, 227-252, fig. 9. REISNER, <i>Additions</i>, 65-66.</p>	
<p>Remarks Baer mentioned an architrave which was found between G 2364 and G 2365 belonging to a person called <i>šm-k3</i> which he date to period VI C or VI E. Most probably this would be the same owner of this mastaba, though I could not find Reisner's mention of this architrave. Reisner mentioned only 7 shafts, while GA mentioned 14 shafts. Shafts U and V in particular were attributed elsewhere by Reisner to G 2410. G 2360 O is not represented on the plan. Probably it is the unlabelled shaft in the west.</p>	

Tomb no. <i>sš3t-ḥtp</i> II	
Name: <i>sš3t-ḥtp</i> II	
Titles	Religious: <i>ḥm-ntr</i>
Bibliography PM III, 153.	
Remarks	

Tomb no. G 4940, LG 45			
Name: <i>sšm-nfr</i> I			
Titles	Scribal: <i>imy-r3 zš hrt ʿ nzw</i> .		
	construction: <i>imy-r3 k3t nzw</i> .		
	Relating to palace: <i>hrp ʿh</i>		
	Religious: <i>ḥm-ntr ḥkt, ḥm-ntr inpw, imy-ḥt h3</i> .		
	Legal: <i>z3b ʿd mr</i>		
	Honorific: <i>rḥ-nzw</i>		
	Other: <i>hry-tp nzw ḥwt hr-ḥpr</i> (temple of Djedefre), <i>hry-sš3 z3b ʿd-mr, wr mdʿ šmʿw, imy-r3 sty df3, hry wdb m ḥt ʿnh, smr</i> .		
Family-dependants	Wife	<i>imn-df3.s</i>	<i>rḥt-nzw</i>
	Sons	<i>rʿ-wr I</i>	G 2570
		<i>pḥ-n-pth</i>	G 5280
		<i>ḥwfw-ʿnh</i>	
		<i>3b</i>	
		<i>sšm-nfr-šri</i>	
	Daughters	<i>ḥwt-ḥr-nfr</i>	
		<i>wrt-k3</i>	
		<i>nfr-h3-ḥwfw</i>	
		<i>sbk-rmts</i>	
	Mentioned	<i>rʿ-htp, isi, ii-nfrit, ifi, imw,, isiw, iši, pr-nb, pth-wr, mdwi, rʿ-htpw, hnti-?, tti</i>	<i>ḥm-k3</i>
		<i>bw-nfr</i>	<i>imy-r3 pr</i>
		<i>nb-ib</i>	<i>shd</i>
		<i>nb-ni</i>	<i>hrp</i>
		<i>Int-ii-mri, iw.f, ist, wni, wnn-nfrw, rsi</i>	
	Estates: 10 in number, the names surviving are:		
1. <i>grgt sšm-nfr</i>			
2. <i>int iy-mry</i>			
3. <i>ḥwfw špss</i>			
Bibliography PM III, 142. BAER, <i>Rank and title</i> , 131 (476). KANAWATI, <i>ACE Reports</i> 16, 51-65. REISNER, <i>Appendix A</i> , 5-10. STRUDIWCK, <i>Administration</i> , 138-139 (129).			
Remarks			

The relationship of *ph-n-ptḥ* to the owner was not mentioned in this tomb, but because the mother of *ph-n-ptḥ* of G 5280 carries the same name as *imn-df3.s*, he was considered a son of *sšm-nfr* I. Reisner remarked that the offering list in this tomb is similar to the list on the tablet of *r^c-ḥtp* of Maidum.

Tomb no. G 5080, G 2200				
Name: <i>sšm-nfr</i> II				
Titles	Scribal: <i>imy-r3 zš^c nzwṯ, zš nzwṯ.</i>			
	Construction: <i>imy-r3 k3t nbt nt nzwṯ.</i>			
	Other: <i>ḥry-sšt3 n wd-mdw nbt nt nzwṯ.</i>			
Family - dependants	Mother	<i>mrt-it.s</i>	<i>rḥt-nzwṯ .</i>	
	Wife	<i>ḥnwt-sn</i>	<i>rḥt-nzwṯ, ḥmt-ntr ḥwt-ḥr nbt nht .</i>	
	Sons	<i>sšm-nfr</i> III	G 5170	
		<i>r^c-wr</i> II	<i>zš^c nzwṯ</i>	G 5470
		<i>r^c-nfr-ḥtp</i>	<i>zš^c nzwṯ, z3b šḥd zš.</i>	
		<i>ph-n-ptḥ</i>	<i>zš^c n nzwṯ.</i>	
		<i>s3tw</i>	<i>zš</i>	G 5480 ??
	Daughters	<i>mrt-it.s</i>		
		<i>ndt-m-pt</i>		
	Grandson	<i>sšm-nfr-šri</i>		
	Mentioned	<i>nfr-ḥtp</i>	<i>z3b šḥd zš.</i>	
		<i>hnt-k3</i>	<i>zš</i>	
		<i>r^c-ḥtp</i>	<i>ḥm-k3</i>	
		<i>ndm</i>		
		<i>ḥtpṯi</i>		
<i>wri</i>				
<i>tn3</i>				
<i>ity</i>				
<i>isi</i>				
Estates: 13 in number, the names surviving are:				
1. <i>ddnw</i>				
2. 3 <i>grgt sšm-nfr</i>				
3. 2 <i>dnw</i>				
4. <i>grgt^cnh-k3</i>				
5. <i>db3 sk3w</i>				
6. <i>grgt ii-mry</i>				
7. <i>ḥwt dw sy</i>				
Bibliography				
PM III, 146-7.				
BAER, <i>Rank and title</i> , 131 (477).				
FISHER, <i>BMFA</i> 11, unnumbered fig.				
JACQUET-GORDON, <i>Domaines</i> , 243-4 (20G5), fig. 50.				
Kanawati, <i>ACE reports</i> 18, 51-64, pls. 24-32, 58-65.				
REISNER, <i>Appendix A</i> , 17-25.				
STRUDWICK, <i>Adminstration</i> , 139-140 (131).				
WEEKS, <i>Cemetery G 6000</i> , 4-7.				

Remarks

In shaft C, a fragment with a date (Year of the 2nd occurrence, 2nd month of *prt*, day 10) was found. Smith attributed this date to Shepseskaef⁶ while Spalinger⁷ attributed it to Niuserre. The attribution of this fragment to Shepseskaef is unclear. Smith argued that since the seal of that king was found in the burial chamber of *sšm-nfr* II it was possible that he was connected with the date. This argument is not compelling.

In reconstructing the *sšm-nfr* family line, the greatest problem is the identity of the father of *sšm-nfr* II, since the obvious candidate, *sšm-nfr* I had a wife with a different name than the mother of *sšm-nfr* II. In the family tree of this family, Junker mentioned a *ḥtp-ḥr.s* who is a daughter of *sšm-nfr* and *ḥtp-ḥr.s*, but the name of this daughter is not found in Reisner's documents for the tomb.

Junker believed that a scene from this tomb was copied from the tomb of *iy-mry*⁸, and that there was some connection between the two shown by the presence of the estate *grgt-iy-mry* in the tomb of *sšm-nfr* II.

Reisner remarked that *r^c-nfr-ḥtp*, *r^c-wr* and *ph-n-ptḥ* are certainly sons of *sšm-nfr* II although they were not referred to as sons. *sšm-nfr-sr* is most probably a son of *ph-n-ptḥ*.

Tomb no. G 5170				
Name: <i>sšm-nfr</i> III				
Titles	Relating to vizierate: <i>t3yty z3b t3ty</i>			
	Legal: <i>z3b r^cd-mr</i>			
	Scribal: <i>imy-r3 zš r^c nzwt</i>			
	Honorific: <i>smr w^cty</i>			
	Royal: <i>z3 nzwt n ḥt.f</i>			
	Religious: <i>ḥ3ty-r^c m ḥry-ḥbt, ḥt mnw</i>			
	Other: <i>ḥry-sšt3 n wd^c nzwt, imy-r3 prwy r^cḥ3w, ḥry-sšt3 n pr dw3t, nst ḥntt</i>			
Family-dependants	Father	<i>sšm-nfr</i> II	G 5080	
	Mother	<i>ḥnwt-sn</i>	<i>rḥt-nzwt, ḥmt-ntr Nt wpt w3wt, ḥmt-ntr ḥwt-ḥr m swt.s nbt</i> G 5080	
	Wife	<i>ḥtp-ḥr.s</i>	<i>rḥt-nzwt, s3t nzwt, ḥmt-ntr ḥwt-ḥr nbt nht, ḥmt-ntr Nt wpt w3wt</i>	
	Sons	<i>sšm-nfr</i> IV	<i>zš r^c nzwt</i>	LG 53
		<i>nfr-sšm-ptḥ</i>	<i>zš r^c nzwt</i>	
	Brother	<i>r^c-wr</i> II	<i>zš r^c nzwt</i>	G 5470
	Probably nephews	<i>r^c-wr</i>	<i>z3b šḥd zš</i>	
		<i>sšm-nfr</i>	<i>zš r^c nzwt</i>	
		<i>sšm-nfr</i>	<i>zš r^c</i>	
	Mentioned	<i>inpw-wsr</i>	<i>imy-r3 pr, imy-r3 ḥm-k3</i>	
		<i>ntr-nfr</i>	<i>zš šḥd ḥm-k3</i>	
		<i>?-df</i>	<i>ḥm (worksmen), ḥm-k3</i>	
		<i>nbi</i>	<i>šḥd ḥm-k3</i>	

⁶ Smith, JNES 11, 1952, 120 and 127

⁷ Spalinger, SAK 21, 292.

⁸ Junker, Giza III, 71

	<i>ḥtpt-k3</i>	<i>šḥd ḥm-k3</i>
	<i>ini</i>	<i>šḥd ḥm-k3</i>
	<i>k3-m-nfrt</i>	<i>ḥm-k3</i>
	<i>rwdw</i>	
	<i>mni</i>	
	<i>k3-sšm</i>	
	<i>ḥmtnw</i>	

Estates: 35 in number, the names surviving are:

1. *int ḥwfw*
2. *ḥnmt ḥwfw*
3. *nfr ḥnm ḥwfw*
4. *nfrw ḥwfw*
5. *nfr ḥw-wsr-k3.f*
6. *ḥtpt s3ḥw-r^c*
7. *ḥnmt nfr-ir-k3-r^c*
8. *mr ntr s3ḥw-r^c*
9. *grgt sšm-nfr*
10. *ḥwt-k3 sšm-nfr*
11. *ḥnmt s3ḥw-r^c*
12. *ḥnty-b3w s3ḥw-r^c*
13. *stp*
14. *mn mnw ḥwfw*
15. *wr b3w.....r^c*
16. *mr-ntr ḥ^c.f-r^c*
17. *iw snfrw*
18. *ḥnmt snfrw*
19. *tbt-----r^c*
20. *iw rd*
21. *grgw*
22. *ḥmwtt*
23. *ḥbnnt sšm-nfr*
24. *wr wp3wt*
25. *w3ḥ wsr-k3.f*
26. *Nḥn wsr-k3.f*
27. *smnt wsr-k3.f*
28. *ḥ^ct š*
29. *išd sšm-nfr*
30. *bndt sšm-nfr ḥnfw sšm-nfr*
31. *ḥwt-k3 sšm-nfr*
32. *irp sšm-nfr*

Bibliography

PM III, 153-4.

BAER, *Rank and title*, 132 (478).

BAUD, *Famille Royale*, 59, 530 (166) , 577-8 (220).

BRUNNER-TRAUT, *Seschemnofers III*, passim.

GAMER-WALLERT, *Von Giza bis Tübingen*, passim.

GRDSELOFF, *ASAE XLII*, 58-61.

REISNER, *Appendix A*, 28-29a.

SCHMITZ, *Königshon*, 33-34 (365).

STRUDWICK, *Adminstration*, 139-40 (131)

Remarks

This mastaba is one of the rare ones which reveal a promotion in the course of construction. *sšm-nfr* III had been an *imy-r3 zš^c nzwt*, as were other members of the family, and apparently was suddenly promoted to *ḥyty z3b ḥty* and even *z3 nzwt n ḥt.f*. These titles are only found on the south wall of the offering chamber. A scene of this tomb is copied from the tomb of his father *sšm-nfr* II.

Tomb no : LG 53				
Name: <i>sšm-nfr</i> IV				
Titles	Honorific: <i>iry-p^ct, smr-w^cty</i> .			
	Other: <i>tpy Nḥb, ḥk3 B3t, ḥrp km, im3^c, ḥrp nsty, ḥrp nsty m ḥwt-^cnḥ, ḥry-sšt3 nzwt, ḥry-sšt3 n nzwt m st.f nbt, ḥry-sšt3 n wd-mdw št3 nzwt, ḥrp ḥ3ts km, imy-r3 ipt nzwt</i>			
Family-dependants	Probably father	<i>sšm-nfr</i> III	G 5170	
	Probably mother	<i>ḥtp-ḥr.s</i>	G 5170 and probably LG 54	
	Sons	<i>nfr-sš-ptḥ</i>	<i>Z3b zš, imy-r3 ḥmw k3</i>	
		<i>ptḥ-ḥtp</i>	<i>swnw pr-^c3, imy-r3 ḥmw-k3</i>	A mastaba to south of LG 53
		<i>štnw</i>		
	Mentioned	<i>sšm-nfr</i>	<i>imy-r3 ḥmw-k3</i>	
		<i>mmri</i>	<i>imy-r3 pr</i>	
		<i>nzwt-nfr</i>	<i>imy-r3 pr nzwt</i>	
		<i>špsi</i>	<i>imy-ḥt imy-r3 pr</i>	
		<i>imy</i>	<i>imy-r3 sšr</i>	
		<i>nzwt-3ḥty</i>		
		<i>sššn</i>		
		<i>m33</i>		
<i>šḥtpw</i>		<i>z3b zš, šḥd ḥmw-k3</i>		
<i>sṯw</i>		<i>zš šnwt</i>		
<i>ššm-nfr</i>		<i>z3b, iry-md3t</i>		
<i>k3-ḥr-ptḥ</i>		<i>zš</i>		
<i>s^cnḥ</i>				
<i>k3r</i>				
<i>3nḥ-m-s3.f</i>				

		<i>iw-k3w</i>	
		<i>sšm-nfr tti</i>	<i>smr-w^cty, hrp nsty, hk3 B3t</i>

Estates: 16 in number, the names surviving are:

1. *mr ntrw nḥ,,,*
2. *mn ḥb issi*
3. *mtn*
4. *nfr issi mrw pth*
5. *mr ht-hr issi*
6. *i3gt issi*
7. *ʿ3 nfr issi*
8. *mr kis nḥ issi*
9. *ḥwt issi mr-r^c-nḥ-issi*
10. *ḥwt issi srwd-r^c-issi*
11. *ḥwt issi sḥtp-r^c issi*
12. *mr m3yt ik3w-hr*
13. *b^cht s3ḥw-r^c*
14. *mrrt iss ḥwt-k3*
15. *b^cht issi*
16. *ḥwt šw*

Bibliography
PM III, 223.

Remarks
LG 53 forms the core of a complex of mastabas which was constructed in three stages and obviously belonged to one family. *ḥtp-hrs* has a chapel and a serdab within the tumulus of LG 53. Since the chapel extends towards the outside of LG 53 and has its own entrance, Junker considered it a complete mastaba and gave it the number LG 54. The other mastabas in the same complex are *sšm-nfr tti* and *pth-ḥtp*. These tombs are located in cemetery GIS, but were included in the study because their owners are members of the *sšm-nfr* family buried in CEE.

Tomb no : <i>sšm-nfr-tti</i>			
Name: <i>sšm-nfr-tti</i>			
Titles	Honorific: <i>smr-w^cty</i> .		
	Other: <i>hk3 B3t</i>		
Family-dependants	Father	Probably <i>sšm-nfr</i> IV LG 53	
	mentioned	<i>nfr-wndt</i>	<i>imy-r3 ššr</i>
		<i>pni, tti, špsy, ḥti, imii, irti, tti.</i>	

Estates: 6 in number, the names surviving are:

1. *ḥnmt sšm-nfr*
2. *ʿgt it sšm-nfr*
3. *mns3 sšm-nfr*
4. *i3m sšm-nfr*
5. *nht sšm-nfr*

Bibliography PM III, 227.
Remarks This mastaba is located in GIS and is a part of the family complex mentioned in LG 53.

Tomb no. G 5150			
Name: <i>sšt-ḥtp ḥti</i>			
Titles	Relating to vizierate: <i>t3yty z3b t3ty</i>		
	Scribal: <i>imy-r3 zšw md3t ntr</i>		
	Construction: <i>imy-r3 k3t nbt nt nzwt , ḥry-sšt3 k3t nbt nt nzwt</i>		
	Honorific: <i>iry-pꜣt</i>		
	Religious: <i>wty-inpw, ḥm-ntr ḥnt-ḥni, ḥm-ntr b3 ꜣnbt, ḥm-ntr ḥr stḥ , ḥm-ntr b3stt, ḥm-ntr šmst, smr</i>		
	Royal: <i>s3-nzwt n ḥt.f , z3 nzwt n ḥt.f smsw</i>		
	Other: <i>wr mdꜣ šmꜣw, ḥry-ḥbt, ꜣd mr wi3, wr m33 iwnw, ꜣ3 dw3w, wn-r3, ḥrp mrwt šmꜣw mḥw,wꜣ n wrw-ḥb</i>		
Family-dependants	Probably wife	<i>mrt-it.s</i>	<i>rḥt-nzwt, ḥmt-ntr ḥwt- ḥr, ḥmt-ntr Nt.</i>
	Probably mother	<i>ḥpt-k3</i>	<i>rḥt-nzwt, ḥmt-ntr ḥwt- ḥr, ḥmt-ntr Nt.</i>
	sons	<i>ḥti</i>	<i>rḥ-nzwt</i>
		<i>šḥnt-k3</i>	<i>zš pr md3t</i>
		<i>sšt-ḥtp</i>	
	daughters	<i>mrt-it.s</i>	
		<i>n-sdr-k3i</i>	
		<i>ḥnwt-sn</i>	<i>rḥt-nzwt</i>
		<i>nsi-nzwt</i>	
		<i>ḥtp-ib.s</i>	
	<i>3wt-ib</i>		
	Probably brother	<i>snw-mri-smsw</i>	<i>ḥm-k3</i>
	Probably sister	<i>Ms-s3t</i>	<i>z3t-nzwt</i>
	mentioned	<i>3wt-ib</i>	<i>rḥt-nzwt</i>
		<i>ipi</i>	<i>imy-r3 pr</i>
		<i>mni</i>	<i>smsw pr</i>
		<i>rhi</i>	<i>imy-r3 sšr</i>
<i>3ḥt</i>		<i>ḥrp šḥ</i>	
<i>ḥtp-k3i</i>		<i>zš</i>	
<i>nfr-it.s</i>		<i>irw ipḥ</i>	
<i>twi</i>		<i>wdpw</i>	
<i>ššsšn</i>		<i>šmsw</i>	
<i>n mtf</i>		<i>šmsw</i>	

		<i>iwf-ni</i>	<i>hk3</i>
		<i>wh^c</i>	<i>hk3</i>
		<i>h3st</i>	<i>hm-k3</i>
		<i>skr-htp</i>	<i>hm-k3</i>
		<i>pth-špss</i>	<i>hm-k3</i>
		<i>k3i-hr-ptḥ</i>	<i>hm-k3</i>
		<i>k3-tt</i>	<i>hm-k3</i>
		<i>ᶜnh-m^c-k3</i>	<i>ms.f dd</i>
		<i>ḥsi</i>	

Estates: 5 in number

1. *sg3*
2. *hnmt ḥwfw*
3. *htpwt ḥwfw*
4. *wh ḥwfw*

Bibliography

PM III, 149-150.

BAER, *Rank and title*, 130-31 (473).

BAUD, *Famille royale*, 58, 472-473 (91), 576-77 (219).

CHERPION, *Mastabas*, 92-94.

GAMER-WALLERT, *Von Giza bis Tübingen*, passim.

KANAWATI, *ACE reports* 18, 11-30.

REISNER, *Appendix A*, 28.

SCHMITZ, *Königsohn*, 73-75.

STRUDWICK, *Adminstration*, 136-7 (126).

Remarks

The southern shaft was discovered in 1914 but the plans and measurements were lost in the war. When Junker made other plans for the tombs in 1925, he could not clear the shaft once more to take measurements.

Mrt-it.s and *htp-k3* bear identical titles and each is depicted on one false door. The relationship of these two, plus three other unnamed women in the same tomb to *sšt-htp ḥti* is uncertain as nowhere any of them is described as his wife. Junker suggested that *mrt-it.s* was the wife and *hpt-k3i* was probably the mother. While this is not unlikely, it is equally possible that both women were his wives. Multiple marriages were not unknown in the Old Kingdom. Kanawati, who studied the children of *sš3t-htp*, noticed two separate and distinct age groups among them, which may hint to two different wives. If this is the case, then *mrt-it.s* might have been the younger woman, since all sons and daughters represented with *sš3t-htp* near his false door with her are shown as naked children.

A scene from this tomb was copied by *nzwt-nfr* (G 4970).

Tomb no. <i>st-k3</i> and <i>pth-htp</i>	
Name: <i>st-k3</i> and <i>pth-htp</i>	
Titles of <i>st-k3</i>	Legal: <i>z3b šḥd zš, z3b imy-r3 zš, z3b imy-r3 zš wd-mdw šṯ3, z3b imy-r3 zš wd^c-mdw šṯ3 ḥwt-wrt, z3b ᶜd mr.</i>
	Scribal: <i>hrp zš m wdt wrt, hrp zš m wdt wrt nt ntr ᶜ3, hrp zš m wdt wd^c-mdw šṯ3 n ḥwt-wrt.</i>
	Other: <i>nst ḥntt, wr md šm^cw, hry tp</i>
Titles of <i>pth-htp</i>	Relating to vizierate: <i>z3b ᶜd-mr.</i>
	Legal: <i>z3b šḥd zš, z3b imy-r3 zš</i>

	Religious: <i>hm-ntr m3ct</i>		
	Other: <i>hry-sst3 n hwt-wrt, hry-sst3 n wd^c-mdw n hwt-wrt, hry-sst3 n wd^c-mdw st3 n hwt-wrt, hrp sš sprw.</i>		
Family-dependants of <i>st-k3</i>	Father	<i>nfr l</i>	G 4761
	Mother	<i>h^tp-m3ct</i>	G 4761
Bibliography PM III, 160-1. BAER, <i>Rank and title</i> , 134 (485).			
Remarks <i>p^th-h^tp</i> is the oldest son of <i>st-k3</i> who turned the tomb to a double mastaba.			

Tomb no. G 2335	
Name: <i>špsi</i>	
Titles	Other: <i>hry-tp nzw^t</i>
Bibliography PM III, 83. REISNER, <i>Additions</i> , 56 a.	
Remarks G 2335 forms a compound mastaba with G 2336 . It appears that G 2336 was built first and enlarged with the western extension of its south end. Later G 2335 was built around the northwest corner and northwards leaving a corridor chapel between its own eastern face and the back of the main structure of G 2336. In the final form the mastaba appears to be joined as one.	

Tomb no. <i>p^th-h^tp</i>	
Name: <i>p^th-h^tp</i>	
Titles	Palace: <i>zwnw pr-^c3</i>
	Religious: <i>imy-r3 hmw-k3</i>
	Honorific: <i>smr w^cty, iry-p^ct</i>
	Other: <i>hry-sst3, smr</i>
family	Father <i>sšm-nfr IV LG 53</i>
Bibliography PM III, 228.	
Remarks The mastaba of <i>p^th-h^tp</i> was attached on the narrow south wall of LG 53 as a later construction.	

Tomb no. <i>k3-nfr III</i>	
Name: <i>k3-nfr III</i>	
Titles	Legal: <i>z3b ^cd-mr</i>
	Scribal: <i>imy-r3 zš</i>

Bibliography PM III, 160.
Remarks PM describes the building as a stone mastaba, while Junker mentions a cult room only.

Tomb no. G 5560, LG 35	
Name: <i>k3-hr-ptḥ fik-t</i>	
Titles	Legal: <i>z3b ʿd-mr, z3b imy-r3 zš</i>
	Relating to <i>šnwt</i> : <i>imy-r3 šnwt</i>
	Scribal: <i>hrp zš sprw, hrp zš, zš ʿ nzwt</i>
	Relating to pyramid complex: <i>imy-r3 niwt m3wt nt nfr-issi, šḥd 3ḥt-ḥwfw</i>
	Religious: <i>ḥm-ntr m3ʿt</i>
Other: <i>wr mdʿ, nzwt ḥntt, imy-r3 inp-ḥd tp-ḥpš</i>	
Bibliography PM III, 166-7. BROVARSKI, <i>Giza VII</i> , 25. STRUDWICK, <i>Administration</i> , 154(150). REISNER, <i>Additions</i> , 47.	
Remarks Brovarski suggested that the owner might be a son of <i>sndm-ib inti</i> (G2370). The title <i>imy-r3 šnwt</i> was taken after Strudwick who also remarked: it is by no means certain that this title is present in the tomb since it is damaged and published only in typeface. Junker did not number the main shaft (a sloping shaft of type 9). I gave it the number G 5560 A on my map.	

Tomb no. G 5340			
Name: <i>k3-s-wd3</i>			
Titles	Relating to palace: <i>hrp-ʿḥ</i>		
	Relating to expeditions: <i>imy-r3 wpwt</i>		
	Honorific: <i>smr wʿty</i>		
	Other: <i>mdw šḥd k3, ḥry-sšḥ n ḥ3swt, hrp tm3wy, imy-r3 ph mrw, smr, imy-r3 mrwy nzwt, smsw m pr-wy</i>		
family	Probably father	<i>k3-nfr</i>	G 2150
Bibliography PM III, 159. BAER, <i>Rank and title</i> , 148 (546).			
Remarks A son of <i>k3-nfr</i> who is represented in his mastaba (G 2150) bears the name <i>k3-s-wd3</i> and might thus be the same owner of this mastaba. This mastaba is worthy of attention because it does not have a core, but only outer walls.			

Tomb no. <i>tn3</i>	
Name: <i>tn3</i>	
Titles:	Religious: <i>hm-ntr hwt-hr.</i>
Bibliography PM III, 149.	
Remarks	

Tomb no. <i>tnti</i>	
Name: <i>tnti</i>	
Bibliography JUNKER, <i>Giza VII</i> , 90-2.	
Remarks The tomb was attributed to <i>tnti</i> because of two seals with this name found in the tomb.	

Tomb no. G 4920, LG 49			
Name: <i>tnti</i>			
Titles	Relating to palace: <i>hrp-ḥ</i>		
	Honorific: <i>smr wḥty</i>		
	Other: <i>hry-sšḫ pr-dwḫt</i>		
Family-dependants	Wife	<i>nfrt-k3w</i>	<i>rht-nzwt</i>
Estates: 15 in number, the names surviving are: 1. <i>mr rḥ hww</i> 2. [...] <i>n3t</i> [...] 3. <i>intt tnti</i> 4. <i>bt sm3</i> 5. <i>iswwt</i> 6. <i>3b</i> 7. <i>grgt tnti</i> 8. [...] <i>mt</i> [...]			
Bibliography PM III, 141. BAER, <i>Rank and title</i> , 152-3 (567).			
Remarks			

Tomb no. G 2338- X	
Name: <i>tnni</i>	
Titles	Religious: <i>shd hm-k3</i>
	Other: <i>imy-r3 sšr n ist-ib nb.f</i>

Bibliography REISNER, <i>Additions</i> , 56 h.	
Remarks The name and titles were written on the base of a limestone fragment before the small mastabas G 2338-A, B, C, X, the original position of which may have been G 2338-X.	

Tomb no. G 5130	
Name: <i>tti</i>	
Titles	Scribal: <i>zš</i> Religious: <i>w^cb nzwt, hm-ntr h_wfw</i>
Bibliography REISNER, <i>Appendix A</i> , 26.	
Remarks The name and titles were written on the base of a limestone statuette which was discovered in the debris south of the tomb.	

Tomb no. G 2338 B		
Name: <i>ttw</i>		
Titles	Religious: <i>shm hb</i> Scribal: <i>imy-r3 Zš^c nzwt</i>	
Family-dependants	mentioned	<i>inti</i>
Bibliography REISNER, <i>Additions</i> , 56 h.		
Remarks The above mentioned names and titles were inscribed on stone fragments found in the debris of the shaft		

Tomb no. G 5511			
Name: <i>ttw II</i>			
Titles	Other: <i>imy-r3 df3 nb</i>		
Family	Sons	<i>hrw-nfr</i>	<i>imy-r3 sšr</i>
		<i>pth-z3bw</i>	<i>imy-r3 pr.</i>
		<i>nfrj</i>	<i>rh-nzwt</i>
		Anonymous	<i>imy-r3 šn^c</i>
		<i>d3w</i>	
Bibliography SIMPSON, <i>Giza IV</i> , 31-32. REISNER, <i>Additions</i> , 56 l.			
Remarks			

Tomb no. G 5110, LG 44		
Name: <i>dw3-n-r^c</i>		
Titles	Relating to vizierate: <i>t3yty z3b t3ty</i>	
	Scribal: <i>zš md3t ntr, mdh zšw nzwt</i>	
	Relating to palace: <i>hrp h</i>	
	Honorific: <i>smr w^cty, iry-p^ct</i>	
	Religious: <i>hry-hb hry-tp</i>	
	Royal: <i>z3 nzwt n ht.f</i>	
	Other: <i>imy-is, 3 dw3w, d-mr wh^cw, wr idt, wr diw pr-dhw^ct, wr inpw, mnw Nhn3ms., r P nb, h^cty-^c, hm-ntr hr inpw hntyw pr šmswt, hry wdb n hwt-^cnh, hry-tp nhb, hrp i3ts km., hrp tis bity, hry-tp nzwt m prwy</i>	
Family -dependants	Mother	<i>mr.s-^cnh III ?</i>
	Father	King Khafre ?
	Brother	<i>nb-m-3ht</i>
	Mentioned	<i>sbhty</i>
<i>sšm-nfr</i>		
<p>Bibliography</p> <p>PM III, 148.</p> <p>BAUD, <i>Famille royale</i>, 606-7 (248).</p> <p>CURTO, <i>El-Ghiza</i> (1903), 72.</p> <p>FLENTYE, <i>Bulletin of the Egyptian Museum</i> 3, 72.</p> <p>REISNER, <i>Appenix A</i>, 31-5.</p> <p>REISNER, <i>Mycerinus</i>, 242 (7)</p> <p>REISNER, <i>Giza I</i>, 218 (31).</p> <p>STRUDWICK, <i>Adminstration</i>, 162 (161).</p> <p>SCHMITZ, <i>Königsson</i>, 75.</p>		
<p>Remarks</p> <p>In the chapel and serdab of this mastaba and in the street to its east were found fragments of royal statues. Some of the royal fragments bear the names of Khufu, Khafre and Menkaure. These statues were apparently brought from the temples of these kings and broken in the shelter of the chapel of G 5110 and in the angle between G 5100 and G 5230 for the purpose of manufacturing alabaster model vessels. The names of <i>sbhty</i> and <i>sšm-nfr</i> were inscribed on fragments from the shaft, and thus might not originate from this tomb.</p>		

Tomb no. G 2337 X		
Name: <i>d3ty</i>		
Titles	Scribal : <i>hrp zš, z3b šhd zš, imy-r3 zš s3</i>	
	Religious: <i>hm-k3</i>	
	Other: <i>mdw n isw</i>	
Family-	Wife	<i>š^cft</i>

dependants	Son	<i>d3ty</i>		
	Mother	<i>š^cft</i>	<i>rht-nzwt</i>	
	Sister	<i>hwt-n-hnm</i>		
	Brothers	<i>hrw-nfr</i>	<i>hm-k3</i>	
		<i>nb</i>		
		<i>sndm-ib</i>		
	Mentioned	<i>tt</i>	<i>imy-r3 pr</i>	
		<i>d3ti</i>	<i>imy-r3 pr zš n hm-k3</i>	
		<i>d3ti</i>	<i>imy-r3 pr</i>	
		<i>sndm-ib</i>	<i>t3ty, z3b f^cty, imy-r3 k3t nbt nt nzwt, imy-r3 zš n ^c</i>	G 2370 ?
		<i>w3dt</i>		
<i>dndm</i>				
<i>sndm-ib</i>				
Bibliography				
SIMPSON, <i>Giza IV</i> , 28-31, pls 53-55, figs 40-41.				
BAER, <i>Rank and title</i> , 156 (590).				
REISNER, <i>Additions</i> , 56 f-g.				
Remarks				
<i>d3ty</i> is a dependant of the estate of the vizier <i>sndm-ib</i> (either <i>inti</i> or <i>mhi</i>).				

Tomb no. G 5370, LG 31	
Name: <i>d3ty</i>	
Titles	Construction: <i>imy-r3 k3t nbt nt nzwt</i>
	Other: <i>wr md šm^cw</i>
Bibliography	
PM III, 161.	
BAER, <i>Rank and title</i> , 156 (589).	
REISNER, <i>Additions</i> , 51.	
STRUDWICK, <i>Administration</i> , 164 (164).	
Remarks	
A wooden chest bearing sealings of lector priests of Sahure and Neferirkare was discovered displaced west of the false door. It is possible that its original location was in one of the shafts and it was brought there by tomb robbers.	
Another person with the same name is depicted as the son of <i>d3ty</i> in his tomb G 7810 at Giza. This man held the almost identical titles of <i>imy-r3 k3t nt nzwt</i> and <i>wr md šm^cw</i> .	

Tomb no. G 2180, G 4990, Junker No: VIII 5	
Name: Anonymous	
Titles	Scribal: <i>imy-r3 zš nzwt</i>

Bibliography REISNER AND FISHER, <i>ASAE</i> 13 , 227-252. REISNER, <i>Appendix A</i> , 10-11.	
Remarks No chapel was found for this mastaba, but it might have been obscured by later additions. The above mentioned title was found inscribed on a fragment of sunk relief in the shaft.	

Tomb no. G 2418	
Name: Anonymous	
Titles	Religious: <i>w^cb, šḥd ḥm-k3 3ḥt-ḥwfw</i>
Bibliography PM III, 93.	
Remarks The above mentioned titles were inscribed on a fragment of limestone relief.	

Tomb no. G 2224			
Name: Anonymous			
Titles			
Family-dependants	Mentioned	<i>k3r</i>	<i>ḥnty-š pr-^c3, w^cb nzwt, ḥm-ntr ḥwfw, ḥm-ntr ḥwt-ḥr</i>
Bibliography REISNER, <i>Additions</i> , 88.			
Remarks The above mentioned name and titles were inscribed on a fragment found in the corridor of the chapel, of a false door stela which had been used in the roofing of shaft X of the same tomb. It probably came from another mastaba.			

Tomb no. G 2332	
Name: Anonymous	
Titles	Scribal: <i>zš (nzwt) m ḥwt-(ntr?) ppi</i> Honorific: <i>smr w^cty</i>
Bibliography PM III, 83.	
Remarks	

The above titles were inscribed on a limestone block found in the tomb brooken into three peices. The orthography of the title *zš (nzwt) m hwt-(ntr?) ppi* is rather peculiar and the reading is uncertain.

Tomb no. G 2396			
Name: Anonymous.			
Titles	Religious: <i>hm-k3</i> Other: <i>imy-r3 pr</i>		
Family-dependants	Mentioned	anonymous	<i>imy-r3 k3t nbt nzwt, hry-tp nzwt, iry-p^ct</i>
Bibliography REISNER, <i>sndm-ib</i> , 182 e.			
Remarks The above titles were inscribed on a limestone lintel which is not mentioned in the documents of Reisner, but whose photo was in the records of the Giza Archive registers. The titles <i>imy-r3 k3t nbt nzwt, hry-tp nzwt, iry-p^ct</i> may refer to the person at whose service the anonymous owner of the tomb was active.			

Tomb no. G 2409		
Name: Anonymous.		
Family-dependants	Mentioned	<i>mst</i>
Bibliography LEHMANN, <i>Serdab</i> , Kat. G140. REISNER, <i>Additions</i> , 120 c-d.		
Remarks		

Tomb no. G 2428			
Name: Anonymous			
Family-dependants	Mentioned	<i>intk</i>	<i>hry-hbt, smr w^cty, zš</i>
		<i>hwit</i>	
Bibliography REISNER, <i>Cemetery 2400</i> , 125 w-x.			
Remarks			

Tomb no. G 5233	
Name: Anonymous	

Family – dependants	Mentioned	<i>t-n-imw</i>	<i>hmt-ntr hwt-hr nbt nht, rht-nzwt</i>
Bibliography REISNER, <i>Appendix A</i> , 40.			
Remarks			

Tomb no. G 5551 , G 2347.			
Name: Anonymous			
Titles	Relating to palace: <i>hry-pr pr-ꜣ</i>		
Family- dependants	Wife	<i>hnt</i>	<i>rht-nzwt</i>
	Mentioned	<i>inti</i>	
Bibliography REISNER, <i>Additions</i> , 56 y.			
Remarks The above mentioned names and titles were recovered from a fragment of an architrave which was found in shaft G 5551 A. .			

Tomb no. G 5563			
Name: Anonymous			
Family- dependants	Wife	<i>nit</i>	<i>rht-nzwt</i>
Bibliography REISNER, <i>Additions</i> , 56 ae.			
Remarks The above name and title were found on a fragment in shaft G 5563 A, and thus might not belong to this mastaba.			

Tomb no. S 508/658			
Name: Anonymous			
Titles	Scribal: <i>imy-rꜣ zš</i>		
	Other: <i>hnty-š</i>		
Bibliography JUNKER, <i>Giza VIII</i> , 27-8.			
Remarks			

Chapter Three
Dating and Development of CEE

As demonstrated in a previous chapter, the nucleus cemeteries in Giza were characterized by the prefabrication of mastabas where cores were planned and laid out first and only afterwards assigned to specific individuals. The building of the mastaba cores, their completion and the final use formed thus a long process separated by several steps of unknown length of time, ranging between years to generations. The stages of construction and use of mastabas in Giza were handled by Reisner, who gave a detailed account about the criteria for dating these several stages¹.

While dating the CEE, distinction should be made between two categories of tombs according to their stages of building: the original mastabas of the three En Echelon lines and the later secondary mastabas².

1- The three En Echelon lines

The three original lines of CEE were obviously a part of older plan of the WCE for a number of reasons, chief among which being the centralized planning visible in aligned streets and avenues of major mastabas, and the evidence provided by the subsequent alterations to individual tombs³. For those 25 original mastabas one should thus roughly differentiate between two phases, namely the creation of the cores and their occupation.

1.1 The creation of cores

The core structures of the 25 mastabas are all of the same type – IIa – according to Reisner's typology. This core type is found in most of the cores of the other nucleus cemeteries in the WCE: all the 10 mastabas in cemetery G 1200 and 10 out of 11 mastabas in cemetery G 2100 are of this type, but only one (G 4860) is found in the large cemetery G 4000. The dating of the creation of the original cores of CEE as estimated by different scholars ranges between the reign of king Khufu to the beginning of the Fifth Dynasty.

Both Reisner and Junker agreed that CEE was built after the two core cemeteries G 2100 and G 4000 to its west and noticed rightly that the tombs in the WCE extended chronologically from west to east, thus making the dating of the easternmost part of the WCE dependant on

¹ REISNER, *Giza I*, 29 ff.

² Here and in the following discussion the words original tombs/mastabas/ cemetery refer to the 25 mastabas of the three En Echelon lines, while the words secondary tombs/mastabas/cemeteries were used to describe any construction erected later than the original 25 mastabas.

³ MANUELIAN, *JARCE* 35, 115-126.

the neighbouring western parts. Junker dated the eastern rows of his *Nordfriedhof* (G 2000) and *Südfriedhof* (G 4000) to the reign of Menkaure. Consequently, he set the upper limit for dating CEE at the end of reign of Menkaure and the lower limit at the beginning of the Fifth Dynasty. Junker has however shown preference at many places of his Giza series to date tombs to the later part of this time range, namely the beginning of the Fifth Dynasty⁴.

His reasons for the above dating can be summarised as following:

- 1- Attributing the cores of CEE to the reign of Menkaure (along with those built under him in G 2000 and G 4000), would mean that more cores were constructed during the reign of this king in the WCE than those under Khufu and Khafre together, which is, in the light of the length of reign of Menakure and the fact that his own pyramid complex was left unfinished, not likely.
- 2- Because G 5110 takes the place which would have been otherwise occupied by two tombs of the third row of CEE, Junker felt that G 5110 is earlier than the creation of that row. The stones of G 5110 are similar to the stones of the tombs built during the reign of Menkaure and the third row should thus be dated to a period after Menkaure.
- 3- The existence of two shafts *ab origine*⁵ in each of the original cores of CEE proves this dating as well, because the older tombs in WCE have usually one shaft. It is also worthy of attention that the main shaft in the tombs of CEE is the southern not the northern one, as the case in the older tombs of WCE had been.
- 4- There is usually an offering place on the southern side of tombs of CEE consisting sometimes of two recesses with a false door each. Such offering places are absent from the older tombs of WCE, which have no recesses on their outer walls.
- 5- There is no reason to reject that Shepseskaef would have continued the building activities in Giza. In spite of the fact that he himself was not buried there, he would have wished to complete the huge building project begun by his grandfather in Giza.
- 6- The mastaba G 4940 was extended by *sšm-nfr* I, who lived in the beginning of the fifth Dynasty⁶, meaning that the 2nd row⁷ of tombs was already complete by that time. This sets the lower limit of building to the beginning of the Fifth Dynasty.

⁴ REISNER, *Giza* I, 12, *Giza* II, 24.

⁵ For mastabas G 4950, G 2180, , G 5060, G 5140, G 5160 only one original shaft was recorded (JUNKER, *Giza* VII, 13, 32, 66, abb. 27, 28; REISNER, *Appendix A*, 10) which may contradict with the statement above.

⁶ Junker dated *sšm-nfr* I to the early Fifth Dynasty because its plan, decoration and material connect his mastaba to that of *mr-ib*. *Giza* III, 14.

⁷ JUNKER, *Giza* VII, 6. But I believe Junker ment the first row becuase G 4940 is located in the first row of CEE from west.

Because of the gap between the tombs of the 60- and 70-rows, Junker also believed that the CEES consists of two groups which were built simultaneously. He argued that the northern part of the CEES was obviously arranged according to the orientation of cores of G 2100, while the southern part follows the orientation of cores of G 4000 – resulting in the peculiar jog between the two parts. Reisner⁸ however held the opinion that all three rows originated from south to north. Janosi found the arguments of Junker unconvincing because the north part has 16 tumuli and the southern part has only 9. In the case of a regular building process, both parts would have met in the middle of CEE. He proposed that an interval of time might have passed between the building of the smaller northern and the larger southern tombs, which might justify this different orientation. Both parts might have been erected though during the reign of one king.

Reisner on the other hand set the original building range earlier than Junker, namely between the middle of the reigns of Khafre and Menkaure, depending on the following points:

- 1- The earliest dated burial in the cemetery was in the reign of Menkaure (seal in G 5190 with the cartouche of Menkaure). Another burial is dated to Shepseskaf (seal in G 5080 with the Horus name of Shepseskaf). This proves that the cores were certainly constructed before the end of the reign of Menakure. Janosi criticised however the tendency of Reisner to fix a date depending on the existence of seals, demonstrating that in both cases, the seals obviously dated to earlier periods than the tombs⁹.
- 2- Reisner believed that the en Echelon principle in this cemetery was imported from the Eastern Field where it appears to have had been introduced as an afterthought when the mastaba G 7530-7540 was reconstructed for Queen *ḥtp-ḥr.s* II, suggesting thus that the CEE in the WCE was constructed after year 13 of the reign of Khafre. Unfortunately the dating of the tombs of *k3-wʿb*'s family, including the tombs of his wife *ḥtp-ḥr.s* II¹⁰ and his daughter *mr.s-ʿnh* III is extremely problematic and one should not count on this date as a starting point for the dating of the western CEE.
- 3- Contrary to Junker, Reisner believed that G 5110 is later than CEE. Since Reisner ascribed that mastaba to Menkaure, he dated the building of CEE to the early period of the reign of Menakure or before his accession. The dating of G5110 to the reign of Menkaure is based on the identification of Reisner of the tomb owners¹¹, which is

⁸ REISNER, *Giza* I, 69 f.

⁹ JANOSI, *OKAA* 2006, 177.

¹⁰ JÁNOSI, *ZÁS* 123, 46-62.

¹¹ Reisner believed that the owner of G 5110 *dw3-n-rʿ* is the son of king Khafre.

often doubtful and based on a series of assumptions. Judging from the position and size of this tomb, Janosi found it possible that G 5110, like the tombs G 1201, G 2100 and G 4000, is the leading mastaba in this cemetery¹².

- 4- Most of the cores in the CEE were constructed ab origine as two-shaft mastabas. The earliest dated two-shaft mastaba at Giza is G 7650, which was constructed in the first half of the reign of Khafre, indicating that the CEE was built after the middle of the reign of the same king.

After excluding any later king of the Fourth Dynasty, Janosi¹³ ended up with Khufu as the most probable creator of the CEE. He proposed therefore the possibility that this cemetery was a part of the huge building project initiated by that monarch at the very end of his reign, but left unfinished and unassigned to particular individuals at his death.

1.2 The occupation of mastabas

As shown in the table below, the additions made to the original cores of the three En Echelon lines to transform them into complete mastabas show no intention of uniformity. The forms of the offering places exhibit little analogy and chapels display a wide range of individual forms by design, position and final execution. All the interior chapels (found in 9 mastabas) were built into the core after removing part of the original masonry and rebuilding the structure. The chapels have – with two exceptions (G 4930 and G 5010) – two false doors in the western wall. There is no evidence for slab stelae which are typical for the earliest tombs in the core cemeteries. On the other hand, at least eight cores remained without any offering place or chapel. Some of these structures seem to have been left unused altogether.

The casing types differ considerably as well. The most expensive casing type, of fine white limestone, is used only in G 5080. The less costly grey nummulitic limestone, masonry W (and probably Z or/and U), was used more frequently, being attested in seven examples, while a larger number of mastabas remained uncased.

All older cores of CEE possess substructures that give a less wealthy impression than the superstructures, all burial chambers being of the unlined types: cheapened modifications of the large lined chamber type 1. Some are with a connecting passage between the burial chamber and the shaft (types 3, 4, 5) while others are without it (type 6). The cheapest shaft type 7 x, the open shaft with chamber constructed in the shaft or with the burial unprotected as in open-pit grave, is also attested. Only in a few tombs are stone sarcophagi attested and the occurrence of canopic

¹² JANOSI, *Giza*, 237.

¹³ JANOSI, *OKAA* 2006, 183.

pits or niches is very rare¹⁴. Many shafts show no traces of burial nor evidence that they had been plundered.

Tomb	Core type	Finished mastaba type	Casing type	Chapel type	Slab stela /reserve head	serdab	Shaft number	Shaft/ chamber type	Burial evidence ¹⁵
G 4910	II a		uncased	I d			2	6 a(2)	Plundered
G 4920	II a	VII a(2)	W	4 a		Yes	2	4 b (2) 6 c(1)	Yes
G 4930	II a	VII e(2)	thick layer of c.b	4 a, 3 a		Yes	2	6 c(1) 4 b(1)	Plundered
G 4940	II a	VII a(2)	W	4 a	Reserve head	Yes	2	3 ar and 3 bf	Yes
G 4950	II a		uncased	No chapel			1		No
G 4960	II a		uncased	No chapel ¹⁶			2		Plundered
G 4970	II a		W	4 a		Yes	2	4 a(1) 6 b(3)	Yes
G 4980 ¹⁷	II a		uncased	No chapel			2		
G 5010	II a	VI a(2)	W	4 b			2	6 b(2) 6 a(2)	Plundered
G 5020	II a		?	8 e			2	6 a(2)	Plundered
G 5030	II a	VII c	Zu	4 a		Yes	2	6 b(2) 4 b(2)	Yes
G 5040	II a		uncased	III a IV a			2	6 b(1) 5	Plundered
G 5050	II a		uncased	Overbuilt? ¹⁸			2		Plundered
G 5060	II a		?	No chapel			1 ¹⁹		No
G 5070	II a		?	destroyed			2		No
G 5080	II a	VII x(2)	X	4 a		Yes	2	4 b(2)	Plundered

¹⁴ Only in shafts G 4940B, G 5080A and G 5170B.

¹⁵ Burial evidence was considered to be the occurrence of a skeleton or any human remains. The occurrence of a sarcophagus alone was not considered evidence for burial since many sarcophagi stayed unused.

¹⁶ The core of G 4960 stayed unused until later at the end of the Fifth Dynasty, when an extension was made in the north of its eastern face, containing a chapel. Junker believed that the owner of this extension used the shafts of G 4960 too. JUNKER, *Giza* VII, 9.

¹⁷ G 4980 is not mentioned in PM. It is located in the German excavation area, but I could not find it in any of Junker's publications. GA attributes one shaft to this mastaba, Reisner (*appendix A*, 10) mentioned two shafts and one small intrusive shaft, but none is drawn on the map of Reisner. I placed the shafts randomly on the map and labelled them: A, B, X. There is no info about the existence of a chapel.

¹⁸ JUNKER (*Giza* VII, 30) commented: *Ob an dem Südende der Vorderseite des Kernes eine Kultstelle eingebaut war, ließ sich infolge der Abtragungen und Verbauungen nicht mehr feststellen.*

¹⁹ Only one shaft was discovered in the south part of G 5060. There is a possibility that there is another shaft in the north, but it could not be found because the mastaba was badly denuded in that part. JUNKER, *Giza* VII, 32.

								3 af	
G 5090	II a		Nummilitic casing	No chapel			2	6 a(2)	Plundered
G 5130	II a		uncased	9 a			2	3 ar 7 x	Plundered
G 5140	II a		?	No chapel			1		Yes
G 5150	II a	VII a(2)	W	4 a		Yes	2		Yes
G 5160	II a		uncased	I c ²⁰			1		No
G 5170	II a	VII a	Numulitic limestone	4 a		Yes	2	3 b(3) ²¹ 3 and 4 a(4)	No
G 5180	II a		uncased	No chapel			2	4 b(2) 7x	Plundered
G 5190	II a		uncased	No chapel			2	4 b(2) 5 a(2)	Plundered
G 2180 (G 4990)	II a		uncased	No chapel			1	6 b(1)	Yes

Out of the 25 original mastabas of the three original En Echelon lines, only 9 show evidence indicating the identity of their owners²²:

G 4920 *tnti* The occurrence of Khufu's name in a domain name in the chapel of this tomb does not provide a dating indication. The criteria of Cherpion suggest a date in the Fourth Dynasty. The types of wigs (criteria 28 and 30) appear with names of kings of Dynasty III and IV, the last of whom is Menkaure. The false door whose thick jambs are decorated on the interior and lateral faces (criteria 49) is a relatively rare feature which occurs in tombs with names of Sened, Peribsen, Khufu, Djedefre and Khafre but with no later king. The tomb is however usually dated to the early or later V Dynasty, based on a remark made by Reisner that the type of its chapel is probably later than the Fourth Dynasty²³. Baer²⁴ dated *tnti* to his period VB (end of Neferirkare -16th year of Djedkare), commenting that he might be dated earlier to the mentioned period. A date in the first half of Fifth Dynasty might not thus be far from reasonable.

Suggested date: first half of Fifth Dynasty.

²⁰ Since G 5160 was excavated by Junker, the chapel was not classified by Reisner. But the chapel seems to be type Ic: exterior c.b. chapel built around a deep recessed nich.

²¹ The subdivision (3) comes only with types 4, 5, 6 . so this must be a mistake of Reisner.

²² G 5140 was excluded because Reisner (*Appendix A*, 27) mistakenly attributed G 5140 to *hnt-k3w.s*, the owner of the adjacent mastaba.

²³ SMITH, *Egyptian sculpture*, 165f.; K. PM III2, 141; Y. HARPUR, *Decoration*, 271: V.1-5.

²⁴ BAER, *Rank and title*, 295.

G 4940 *sšm-nfr* I: The only royal names mentioned in the mastaba are those of Khufu and Djedefre, yet many other indications suggest a later date. Janosi²⁵ believed that *sšm-nfr* I can be the father of *sšm-nfr* II in spite of the lost connection between them. Because *sšm-nfr* II is to be dated to the reign of Niuserre, *sšm-nfr* I can be placed in the beginning of the Fifth Dynasty in the period between Sahure to Neferirkare. Junker²⁶ and Harpur²⁷ preferred a date early in the Fifth Dynasty as well. This dating agrees with the form of the chapel and its decoration. Strudwick²⁸ classifies Giza chapels with two false doors in the west wall into three stages according to the position of the tomb owner's figure between the two false doors. In the second stage, as in the case of *sšm-nfr* I, the owner stands facing right. According to this criterion he dates this tomb to early Fifth Dynasty. Features of decoration included a chair with back and cushion (criterion 6 of Cherpion) which was rare before the reign of Isesi and common afterwards. This type of chair appears however once in the tomb while the earlier type with cushion but no back (criterion 3) is attested three times in surviving reliefs. The form and height of the loaves of bread on the offering table above the northern false door (criterion 18) are found in the Fifth Dynasty tombs, and rarely in earlier or later ones. The title sequence of *sšm-nfr* I, according to Baer²⁹, violates the standard ones brought into use in the reign of Neferirkare. In all probability thus the tomb was built before that reign. The decoration of the west wall of the chapel was classified by Reisner into his scheme 1 which adds support to the date from the title sequence. One of the estates of *sšm-nfr* I is called *int ii-mri*. Funerary estates formed with the name of *ii-mri* are found as well in the chapels of *sšm-nfr* II (G 5080) and of *ii-mri* (G 6020). It is possible that all of these estates were named after the son of *wnšt* (G 4840), a Fourth Dynasty *zšt nzwt*. On the basis of the above mentioned evidence, Kanawati suggested a date in the Fifth Dynasty for *sšm-nfr* I between Sahure and Niuserre.

A reserve head, characteristic for the reign of Khufu, was discovered in shaft G 4940 B. Had it been an original find, such a head would have indicated an earlier date for the tomb. Reisner has however commented that the head is certainly intrusive and probably comes from one of the cores of cemetery G 4000, perhaps from G 4740³⁰.

Suggested date: first half of Fifth Dynasty between Sahure and Neferirkare.

²⁵ JANOSI, *Giza*, 241.

²⁶ JUNKER, *Giza III*, 14.

²⁷ HARPUR, *Decoration*, 270.

²⁸ STRUDIWICK, *Administration*, 138-139 (129).

²⁹ BAER, *Rank and title*, 131 (476).

³⁰ REISNER, *Appendix A*, 8.

G 4970 *nzwt-nfr*: The owner has a title containing the name of king Khafre acting as a terminus ante quem non. The iconographical criteria of Cherpion favour a date in the Fourth Dynasty, some criteria being associated with the names of Khafre and Menkaure. Cherpion³¹ dated this mastaba thus to the Fourth Dynasty. Baud³² embraced a date in the second half of the same Dynasty, especially under Khafre. This dating does not disagree with the time frame proposed by Reisner for the chapel of the tomb. According to the latter the chapel type 4a dates to the period between Menkaure to the Neferirkare³³. Junker dated *nzwt-nfr* to the most recent range of this period, namely to the beginning or middle of the Fifth Dynasty³⁴. The excavator saw the L shaped chapel with two false doors as an indicator of the previously mentioned date, though he agreed that the type might be more ancient than the Fifth Dynasty. Nevertheless based on his evaluation of the decoration which he compared with that of *sš3t-ḥtp ḥti*, and the titles he assigned *nzwt-nfr* the late date. Janosi agrees that the finishing of this chapel is not to be dated earlier than the beginning of the Fifth Dynasty³⁵. The dating of the statue of the wife, *ḥnit*, to the Fourth Dynasty³⁶ forms however an obstacle to the dating to the next Dynasty unless it could be accepted that *nzwt-nfr* reused an old statue for his wife.

Most scholars considered the dating of this tomb in conjunction with that of *sš3t-ḥtp ḥti* (G 5150), which is believed to have influenced its decoration. Kanawati³⁷ emphasized that scenes in the two tombs are almost identical and that the similarity of the decoration of the two chapels exceeds the usual influence found between other tombs, or even the copying of one or more motifs. Such similarities include: the layout of the scenes, the subject matter, most individual motifs, the types of chairs and tables, the height of the bread loaves on the offering tables and the type and placement of boats. One is inclined to think that the two tombs were decorated by the same artists or that the two tomb owners, who presumably had to agree on such similarities, were related. The different names and titles of the tomb owners, their families and dependants does not however allow to construct a particular relationship. With *nzwt-nfr* probably copying scenes from *sš3t-ḥtp*'s chapel, he is likely to be later.

Suggested date: early Fifth Dynasty around Sahure.

³¹ CHERPION, *Mastabas*, 114.

³² BAUD, *Famille royale*, 57, 505-6 (135).

³³ REISNER, *Giza I*, 214.

³⁴ JUNKER, *Giza III*, 16.

³⁵ JANOSI, *Giza*, 241.

³⁶ CHERPION, *Mastabas*, 114; ZIEGLER, *Egyptian Art*, 286ff. (80); ARNOLD, *Pyramids*, 63.

³⁷ KANAWATI, *ACE reports* 18, 36.

G 5020 *ii-m-htp*: The mastaba has an exterior chapel of composite construction with several alterations and additions, but with no inscriptions. The name of the deceased was retrieved from a double ledge rectangular offering basin³⁸, which can be classified into type C2 dated by Mostafa³⁹ to the second half of Fifth Dynasty.

Suggested date: second half of Fifth Dynasty.

G 5040: *k3-m-ḳd* and *b3-šps*: The mastaba was left uncased and remained without a chapel until the end of the Fifth Dynasty at least when two rock cut chapels, one for each owner, were added under the southern part of its face, exactly in the same location where the normal chapel would have been inserted⁴⁰. Shaft G 5040 D, subsidiary to the rock-cut chapel of *b3-šps*, is of the sloping passage type, 9 b(1) which is not to be dated earlier than the late Fifth Dynasty⁴¹.

Suggested date: late Fifth Dynasty.

G 5080 *sšm-nfr* II : The owner belongs to the third generation of the *sšm-nfr* family. Junker made a chronology for this family, which consists of 6 generations, and placed *sšm-nfr* II in the advanced Fifth Dynasty⁴². A fragment with a date (Year of the 2nd occurrence, 2nd month of *pṛt*, day 10) was found in shaft G 5080 C. Although a seal impression of Shepseskaf was found in this mastabas, Spalinger⁴³ attributed the date to the reign of king Niuserre. Junker suggested that *sšm-nfr* II might have copied parts of the decoration from the tomb of *iy-mry* (G 6020)⁴⁴ which is probably to be dated to the reign of Niuserre⁴⁵. This date agrees with the estimate of many scholars for this tomb. Reisner⁴⁶, Baer⁴⁷, Kanawati⁴⁸, Strudwick⁴⁹, Harpur⁵⁰, and Weeks⁵¹ accepted a dating for *sšm-nfr* II in the earlier part of of the same reign.

Suggested date: Niuserre.

³⁸ REISNER, *Chapter 9*, 84.

³⁹ MOSTAFA, *Opfertafeln*, 115.

⁴⁰ JANOSI, *Giza*, 250, note 1540.

⁴¹ REINSER, *Giza I*, 153.

⁴² JUNKER, *Giza III*, 14.

⁴³ SPALINGER, *SAK 21*, 292.

⁴⁴ JUNKER, *Giza III*, 71.

⁴⁵ GAMER-WALLERT, *Von Giza bis Tübingen*, 57.

⁴⁶ REISNER, *BMFA 37*, 29.

⁴⁷ BAER, *Rank and title*, 132 (477).

⁴⁸ KANAWATI, *Administration*, 154 (308).

⁴⁹ STRUDWICK, *Administration*, 139 (130).

⁵⁰ HARPUR, *Decoration*, 270.

⁵¹ WEEKS, *Giza V*, 4-7.

G 5130 *tti*: Other than the two monolithic stelae which were torn out, there is no decoration in the tomb. The name and titles of the owner were written on the base of a statuette which was discovered in the debris near the tomb, the attribution being thus weak. Furthermore, inscriptions on that statuette contain no useful dating criteria. The name of the deceased, *tti*, was in use during the OK since the Third until the Sixth Dynasties⁵², and the priestly title of king Khufu is no more helpful. However the mastaba has an open air passage of type 9 a, a rare type which occurs more often in the CEEN, suggesting a relatively late date for the occupation of the mastaba, lower range being the second half of Fifth Dynasty.

Suggested date: Second half of Fifth Dynasty.

G 5150 *sšt-ḥtp ḥti*: Junker believed that the upper limits of this mastaba is the end of Fourth Dynasty because it is an alternation of a building of an earlier mastaba (*Umbau*) but judging from the sequence of building, he concluded that the finishing of the mastaba in its final form took place when the adjacent mastaba of *tnti* was already standing⁵³. He consequently dated *sšt-ḥtp ḥti* to the begin of the Fifth Dynasty.

Strudwick⁵⁴ believed that the tomb of *sšt-ḥtp ḥti* must be dated to the period before he became vizier and grouped it on stylistic grounds with tombs from the early Fifth Dynasty as well. This date is in agreement with that of Baer⁵⁵, who places the tomb in the early Fifth Dynasty, before the introduction of an organised system of ranking titles

Kanawati⁵⁶ considered the dating of this tomb in conjunction with some others in the vicinity, particularly with that of *nzwt-nfr* (G 4970) which shows evidence of direct influence by or copying from *sšt-ḥtp*'s scenes, and suggested a date in the reign of Sahure, probably the middle of the reign for the building and the decoration of the tomb. The scenes depicted in the chapels of both tombs have been studied by Harpur⁵⁷, who shows that the presentation of a short list, depicted on the north walls of both chapels, is found in a limited number of mastabas in the west field at Giza all dating to Userkaf or Niuseerre.

A man called *ḥti* bearing the titles *ḥ3ty-ꜥ ḥry-ḥpt* was depicted in the funerary temple of Sahure⁵⁸. The title *ḥ3ty-ꜥ* ascribed to *ḥti* on the walls of the temple does not appear on the

⁵² RANKE, *Personennamen*, 384 (4), c.f Harpur, *Decoration*, 271. PM III, 246, 503, 684.

⁵³ JUNKER, *Giza II*, 173.

⁵⁴ STRUDWICK, *Administration*, 136-7 (126)

⁵⁵ BAER, *Rank and title*, 293.

⁵⁶ KANAWATI, *ACE reports* 18, 16-18.

⁵⁷ HARPUR, *Decoration*, 74.

⁵⁸ BORCHARDT, *Sa3hu-Raꜥ*, pls. 17, 33, 50, 34, 47.

walls of his tomb. If *sš3t-ḥtp ḥti* was the same *ḥti* of Sahure's temple then he must have decorated his tomb before the completion of the temple where he is described as *ḥ3ty-ḥ*.

However, according to the criteria 30 and 38 of Cherpion which are last attested under Djedefre, it is possible to consider a re-dating for the occupation of this tomb to the period Khufu-Djedefre.

Suggested date: Sahure?.

G 5170 *sšm-nfr* III: The estate names in this tomb contain names of kings of the Fifth Dynasty: Userkaf, Sahure and Neferirkare. These names alone deliver a terminus ante quem non in the middle of the Fifth Dynasty. Baud⁵⁹ believed consequently that the reign of Neferirkare is the most proper dating for the occupation of the tomb. However, because it is reasonably certain that *sšm-nfr* II was the father of *sšm-nfr* III, the later is usually dated to the late Fifth Dynasty, in the range between the reigns of Niuserre to Isesi. The detailed and rich execution of the serdab of *sšm-nfr* III supports a date in the advanced Fifth Dynasty as well. Moreover, in the tomb of his brother *rḥ-wr* II (G 5470) a sealing of Isesi was found and thus a dating to the same reign would be possible for *sšm-nfr* III. Baer⁶⁰ agreed on a dating for this tomb in the early part of the reign of Isesi.

According to Strudwick⁶¹, the tomb of *pn-mrw* (G2197), who was in the service of *sšm-nfr* III, can not be, if only because of the location, dated earlier than the end of the Fifth Dynasty. This gives also an evidence about the time frame of his employer *sšm-nfr* III. Strudwick suggested thus a date in the reign of Menkauhor to the early middle reign of Isesi.

Grdseloff⁶² believed that *sšm-nfr* III held the position of a vizier for a short time only, most probably after *mn-nfr* who functioned as a vizier until the early years of Isesi. The successor of *sšm-nfr* III was probably *snḏm-ib inti* who was in office in the 16th year of Isesi⁶³. Because the titles *ḥ3ty s3b ḥ3ty* and *z3 nzwḥ n ḥt.f* are only found on the south wall of the offering chamber, *sšm-nfr* III seems to have received his promotion to the vizierate after most of the decoration of his tomb had been completed.

The sequence of building, combined with family relations, provides a piece of evidence for a slightly earlier date. G 5370 was constructed before G5270, the tomb of *rḥ-wr* I, who was an

⁵⁹ BAUD, *Famille Royale*, 59, 530 (166) , 577-8 (220).

⁶⁰ BAER, *Rank and title*, 273.

⁶¹ STRUDWICK, *Administration*, 139-40 (131)

⁶² GRDSELOFF, *ASAE* 42, 58-61.

⁶³ HELCK, *Untersuchungen*, 137.

uncle or granduncle for *sšm-nfr* III. *d3ty*, the owner of G 5370, might have belonged to the generation of *sšm-nfr* I. This means that *sšm-nfr* III lived probably in the time of Niuserre⁶⁴.

Suggested date: Niuserre to Isesi.

The above discussion demonstrates that the occupation of most tombs is usually dated to a later period than the date proposed by Resiner for the creation of the original cores of CEE (Khafre–Menkaure). Although having set a later time frame for the creation of the cemetery, Junker⁶⁵ had already noticed the time gap between the creation of the cores and their occupation. Attempting to justify this phenomenon, he explained that many mastabas of CEE remained unoccupied because of the excessive building activities by successive kings. He also proposed the possibility that officials who had been assigned these tombs, might have been buried elsewhere or fell out of favour. When Giza cemetery lost its attraction as an elite burial ground after the Fourth Dynasty, only few high officials remained willing to be buried there. Janosi⁶⁶ raised the same question again but did not provide a new answer. Comparing the measurements of shafts within mastaba's bodies to the measurements of substructure elements, he concluded that most of the substructures in the CEE were not constructed simultaneously with their cores but were later in date, suspecting that those tombs left without proper owners in the reign of king Khufu were gradually and much later occupied by persons using these empty structures. He concluded that the first occupations of the cemetery should be attributed to the wealthy occupants of mastabas, dating at the earliest to the late the Fourth Dynasty and extending through the first half of the Fifth Dynasty. Other anonymous less wealthy mastabas should have been occupied later, namely in the second half of the Fifth Dynasty.

The time gap between the creation of tombs and their occupation may be reduced according to the opinion of Baud⁶⁷, who, based on iconographic evidence and the dating criteria of Cherpion⁶⁸, embraced a date in the second half of the Fourth Dynasty, especially under Khafre, for the occupation of several original cores of CEE (G 4970, G 5150, G 5210, G 5110).

⁶⁴ GAMER-WALLERT, *Von Giza bis Tübingen*, 57.

⁶⁵ JUNKER, *Giza VII*, 8

⁶⁶ JANOSI, *OKAA* 2006, 179.

⁶⁷ BAUD, *Famille royale*, 56.

⁶⁸ CHERPION, *Mastabas et Hypogees*, 25-82.

It is worthy of attention that in this cemetery many tombs have copies of decoration of others. *Nzwt-nfr* G 4970 copied the scenes of *ḥtp-sš3t ḥti* (G 5150). *sšm-nfr* II (G 5080) copied *ii-mri* (G 6020) and finally *sšm-nfr* III (G 5170) copied *sšm-nfr* II (G 5080)⁶⁹.

1.2.1 Dating the occupation of mastabas by seriation

An attempt to classify the mastabas of the three En Echelon lines according to the tomb features which are logically linked to the occupation phase was carried out. The types entered were :

- 1- Chapel type.
- 2- The existence of serdab.
- 3- Casing type.
- 4- Types of original shafts.
- 5- Burial chamber type.
- 6- Burial chamber orientation.
- 7- Blocking type.
- 8- Names of kings
- 9- Features of march and agricultural scenes (as classified by Harpur⁷⁰).
- 10- The criteria of Cherpion⁷¹.

Graph 1 shows the outcome of the seriation attempt. When the suggested date mentioned above for the tombs with known owners was inserted on the graph, no discrepancies between the suggested date and the seriation arrangement of tombs were noticed.

2. The secondary tombs

After the erection of the three original rows of mastabas in CEE, the uniform planning of the WCE ceased and the growth of the cemetery became characterised by a lack of order. As in other nucleus cemeteries at Giza, each main mastaba in the three En Echelon rows became the nucleus of a small group of later tombs built around it, usually leaning on walls of the large mastaba. The rather irregular arrangement in those areas of the cemetery can allow the reasoned judgement that those tombs were constructed following a flexible convention with little interference by the "necropolis authority" if any. The erection of those later tombs marked thus the beginning of a new phase of development of the cemetery where individuals

⁶⁹ For similar cases of copying of decoration see: HARPUR, *Decoration*, 21ff ; SMITH, *Egyptian sculpture*, 361ff
⁷⁰ HARPUR, *Decoration*, 355-376.

⁷¹ It is worthy of mention that the last two types were not entered for two tombs, G 5110 and G 5040, due to the lack of proper publication for their decoration.

started to plan, build and occupy their own tombs. While it is quite possible that in some cases elements of tombs were added by successive generations of a family, the dating for those tombs will be dealt with in a single phase as a usually valid generalization.

Dating estimates suggested by different scholars for OK cemeteries derive their conclusions from several pieces of evidence; among others: the dates of masons' graffiti⁷², the occurrence of names of kings, the reconstructed genealogies of tomb owners⁷³, the title sequence of officials⁷⁴, the stylistic comparison of decoration⁷⁵, of architectural elements⁷⁶ and of objects⁷⁷.

Naturally the occurrence of these dating indicia differ in each cemetery. Listed below are the pieces of evidence related to dating in the secondary cemetery of CEE.

2.1 Evidence from masons' graffiti

Two graffiti dates were attested in the secondary tombs. In the serdab of G 5470 a graffito with the date (year of the 11th count) was found⁷⁸. The date was attributed to the reign of Isesi because a seal with the name of the king was discovered in shaft G 5470 A of the same tomb. Under G 5552 another graffito with the date *rnpt-sm3-t3wi* II, *šmw sw* 10 was incised on a white limestone block. Smith⁷⁹ suggested that this block is perhaps a Fourth Dynasty construction piece abandoned for some reason, and the mastaba was dated rather to the Sixth Dynasty.

2.2 Evidence from names of kings

Out of the 427 tombs of CEE, 37 tombs possess occurrences of names of kings including: Snefru, Khufu, Djedefre, Khafre, Menkaure, Shepseskaef, Userkaf, Sahure, Neferirkare, Menakauhor, Niuserre, Isesi, Unas, Teti, Pepi I and Pepi II. Those names occur either in seal

⁷² SMITH, *JNES* 11, 113-128.

⁷³ HARPUR, *Decoration*, 285-299.

⁷⁴ BAER, (K.), *Rank and Title in the Old Kingdom, The Structure of the Egyptian Administration in the Fifth and Sixth Dynasties*, The University of Chicago Press, Chicago, 1960.

⁷⁵ CHERPION (N.), *Mastabas et Hypogées d'Ancien Empire. Le Problème de la Datation*, Connaissance de l'Égypte ancienne, Brussels. 1989. BAUD (M.), A propos des Critères Iconographiques Établis par Nadine Cherpion in *Les critères de datation stylistiques à l'Ancien Empire*, Bibliothèque d'Étude 120, Cairo, 1998.

⁷⁶ For example false doors: BADAWY, *ASAE* 48, 213-43; HASSAN, *Giza* V, 65-180; MULLER, *MDAIK* 4, 165-206; JUNKER, *Giza* II, pp. 4-19; FISCHER, *Dendara*, pp. 57-65; WIEBACH, *Die ägyptische Scheintür*, 17-21.

⁷⁷ For statues: R. STADELMANN, Formale Kriterien zur Datierung der Königlichen Plastik der 4. Dynastie, in N. Grimal (Éd.), *Les critères de datation stylistiques à l'Ancien Empire*, Le Caire 1998, 365 et 373 fig. 10; CHERPION (N), 1998, La statuaire privée d'Ancien Empire' indices de datation, in Grimal, N. (ed.), *Les Critères de datation stylistiques à l'Ancien Empire*, *BdE* 120, IFAO, Cairo, 97-142. For offering tables or slabs: M. Mostafa, Untersuchungen zu Opfertafeln im alten Reich, *Hildesheimer Ägyptologische Beiträge* 17 (Hildesheim, 1982)

⁷⁸ JUNKER, *Giza* VIII, Abb. 12, 38-40.

⁷⁹ SMITH, *JNES* 11, 127 (7), fig 6; JANOSI, *Giza*, 441 note m.

impressions, within autobiographical inscriptions, within titles (*hm-ntr N, im3hw hr N*, titles of pyramid or pyramid town) or within domain names.

Seal impressions are an important find, which is often used as basis for a more or less reliable dating. Reisner and Junker had different opinions concerning the dating value of these impressions. While Reisner⁸⁰ believed that the occurrence of a king's name on a seal should mean that it was not placed in a tomb more than a comparatively short time after the ruler's death, if not during his reign, Junker⁸¹ doubted the chronological validity of such seals. Because Anubis was depicted often on these seals, Junker believed that most of these seals originated from the funerary estate of the dead king and do not thus provide a certain evidence for the dating.

Seal impressions occur in four tombs of the secondary cemetery. In addition to the above mentioned seal of Isesi found in G 5470, a wooden chest bearing sealings of lector priests of Sahure and Neferirkare was discovered in G 5370⁸². The seal in the last case does not necessarily mean that the burial took place in the mentioned reign, since it is possible that the chest in G 5370 would have been placed there after the burial. In spite of that it is generally accepted that G 5370, the tomb of *d3ty*, dates to the reign of Neferikare or little later⁸³.

A partially preserved box sealing bearing only a part of the sign *h^cw*⁸⁴ was found in shaft G 2375 A. Reisner had reconstructed that sign to the Horus name of Isesi (*dd-h^cw*), but Smith⁸⁵ preferred a reconstruction to the Horus name of Merenre I (*snh-h^cw*) or to that of Pepi II (*ntr-h^cw*). Interpreting the evidence of the sequence of building, he found it probable that *3ht-mhw*, owner of G 2375 was not as early as Reisner thought and was buried either in the short reign of Merenre I or early in that of Pepi II.

A domed jar sealing found on a two handled vase was discovered in G 2381 A⁸⁶. In spite of the bad preservation, the Horus and throne names of Pepi II could be reconstructed. The owner of the tomb *impy* is a well known official who belongs to the *sndm-ib* family⁸⁷.

⁸⁰ REISNER, *Giza* II, 48-59. Reisner even built his theory about the early development of the Giza cemetery depending on the occurrence of seal impressions in G 1200.

⁸¹ JUNKER *Giza* II I, 16.

⁸² Junker, *Giza* VII, Taf. XXXVIII.

⁸³ JUNKER, *Giza* III, 13; STRUDWICK, *Administration*, 164 (164); BAER, *Rank and title*, 156 (589).

⁸⁴ KAPOLNY, *Rollsiegel*, 443f.

⁸⁵ REISNER AND SMITH, *Giza* II, 53. Smith reached that conclusion by arguing that G2375 was built after G2370 and G2378 and before G 2374. However because G 2374 belongs to *hnm-inti* who possessed estates with names of Unas and Teti, the original reconstruction of Reisner for the seal to the name of Isesi seems more reasonable.

⁸⁶ KAPOLNY, *Rollsiegel*, 415f.

⁸⁷ For dating see infra p. 116.

While it is an established fact that royal names within titles serve mainly as a *terminus ante quem non*, deriving more precise chronological significance from such titles is controversial. Concerning the title *hm-ntr* N, it is not usually interpreted as an evidence that the official witnessed the reign of the king. Actually Junker⁸⁸ thought quite the opposite. As a proof that kings of ancient Egypt had a status less than gods during their lives, he tried to prove that (*hm-ntr* N) appeared after the king's death only and was never used while the king was still alive, an argument which Baer⁸⁹ refused by giving several examples of officials who did carry (*hm-ntr* N) while serving the same king. Helck⁹⁰ agreed that the previous title can occur already during the lifetime of the king.

15 examples of the title *hm-ntr* N were attested in CEE (map 3.1). The majority of these cases, 12 in number, belong to king Khufu. Since the occupation of all of these tombs date with reasonable certainty to a later period than the reign of that king, the situation in CEE seems to be more in accordance with the opinion of Junker.

As for the title *wꜥb* N, Junker⁹¹ suggested that it was only used during the lifetime of the king. Thus any bearer of that title might be contemporary with the king whom he served as *wꜥb* priest. However, no bearer of the title *wꜥb nzwt* N was attested in CEE.

Although royal names in titles, seals and domains have little chronological value in general, it could be noticed that the names of the earlier kings (Khufu, Djedefre and Khafre) occur more often within the undoubtedly older tombs in CEES. To interpret the spatial distribution of names of kings chronologically, each king was given a serial number which expresses his chronological order. The serial numbers of the last mentioned king in each of the 37 tombs were entered into the database as listed in the below table. When a high low clustering test (Getis Ord General G) was carried out, the high general G index value indicated that high values are clustered within the study area (map 3.2). The clustering of the names of later kings increases the chronological value of the occurrence of royal names in CEE.

⁸⁸ JUNKER, *Giza VI*, 7-15.

⁸⁹ BAER, *Rank and Title*, 45.

⁹⁰ HELCK, *Beamten titeln*, 128-9.

⁹¹ JUNKER, *Giza VI*, 13.

Gravello	names of k	serial
G 5540	Khufu	1
G 2384	Khufu	1
G 2418	Khufu	1
G 5530	Khufu	1
G 2420	Khufu	1
G 2353	Khufu	1
xwfw-snb I	Khufu	1
G 5150	Khufu	1
xwfw-snb II	Khufu	1
nsw-qdw II	Khufu	1
G 5610	Khufu	1
G 5210	Khufu	1
G 5130	Khufu	1
G 4920	Khufu	1
G 4911	Khufu	1
G 2224	Khufu	1
G 4940	Khufu, Djedefre	2
G 4970	Khafre	3
G 5190	Menkaure	4
iri-n-Axti	Menkaure	4
G 2197	Menkaure	4
G 5080	Khufu, Shepseskaf	5
G 5370	Sahure, Neferirkare	8
G 5170	Snefru, Khufu, Khafre, Userkaf, Sahure, nfrirkare	8
G 5470, LG 32	Isesi	11
G 2370	from Userkaf to Isesi	11
G 2352	Khufu, Isesi	11
G 5560	Khufu, Isesi	11
G 2378	Neferirkare, Menkauhor, Isesi, Unas	12
anx-wDA iti	Isesi, Unas	12
G 2385	Teti	13
G 2374	Unas, Teti	13
G 2381	Pepi I	14
G 2332	Pepi I	14
G 4941	Pepi I	14
G 2375	isesi, Merenre I	15
G 2381 A	pepi II	16

2.3 Evidence from the stylistic criteria of Cherpion

In conjunction with the occurrence of names of kings, the 64 stylistic criteria of Cherpion provide indications of dating depending on features of decoration: chairs, offering tables, clothing, false doors and several other elements. Six decorated tombs with names of kings are located in the secondary cemetery, the dating of two of which (G 2378, G 2381) will be treated in the forthcoming discussion about the evidence from family lines.

G 5530 *mmi*: Criterion 10 is attested in this tomb. The chair legs modelled as bulls legs appeared since the beginning of the OK but eventually disappeared, as they were gradually replaced by the lion legs, being last attested in mastabas with the name of Isesi. When a name of a later king appeared in an accidental manner, it is always in the provinces or on very crude monuments probably created by later artists as an imitation. Taking into consideration

as well the small size of the tomb and its placement within sequence of building⁹² (G 5480-G5481-G5530), a dating to the second half of Fifth Dynasty would be reasonable.

Suggested date: second half of Fifth Dynasty.

G 5560 *k3-hr-ptḥ ftk-t*: The tomb is usually dated to the Sixth Dynasty for several reasons. In the burial chamber on the east wall there is a depiction of the deceased seated before an offering list. Junker remarked that the introduction of the figure of the deceased into the burial chamber should be an indication for a late date. Strudwick⁹³ believed that the decoration of one wall in the burial chamber is an example of the progression from the simple list in the burial chamber of *snḏm-ib inti* (G2370), and, because the tomb is located next to that of *nfr idw I*, which is probably to be dated to the middle of Sixth Dynasty, he suggested a date in the first half of that Dynasty. Baer⁹⁴ dated this tomb to his period VI G (Pepi II to end of Eighth Dynasty), though the sequences are broken and not all in agreement. However, the criteria of Cherpion 4, 6, 18, 25 associate the tomb more with the Fifth Dynasty. The first criterion in particular, the absence of the back of the chair and the pointed edge of the cushion, would perhaps render a date in the Sixth Dynasty unlikely because it does not occur with royal names after Isesi except for one exception with the name of Unas.

Suggested date: late Fifth Dynasty at the earliest.

G 5210 *hm-tn*: Baud⁹⁵ dated this tomb to the second half of the Fourth Dynasty. This dating is in accordance with some of the criteria of Cherpion available in this tomb 1, 3, 10. However other criteria 18, 39, 41a, may add the first half of the Fifth Dynasty as an upper range for dating this tomb because they occur less frequently with names of kings of the Fourth Dynasty.

Suggested date: Second half of the Fourth Dynasty- first half of the Fifth Dynasty.

G 5032 *rdi-ns*: While Brunner⁹⁶ and Wreszinski⁹⁷ originally dated G 5032 to the Fifth Dynasty, most writers since have assigned the false door to the Sixth Dynasty. Most of the criteria of Cherpion which are present on *rdi-ns* false door, however, suggest a date in the first half of the Fifth Dynasty around the reign of Niuserre. These criteria include: a stool

⁹² See infra p. 131.

⁹³ STRUDWICK, *Administration*, 154(150).

⁹⁴ BAER, *Rank and title*, 228.

⁹⁵ BAUD, *Famille Royale*, 542-4 (118).

⁹⁶ BRUNNER, *Hieroglyphische Chrestomathie*, pl. 3.

⁹⁷ WRESZINSKI, *Gräber des Alten Reiches*, 39.

without back or cushion (criterion 1) showing bull, rather than lion, legs (criterion 10); the form of the loaves upon the offering table (criterion 16); the form of the table set on the jar stand (criterion 24); the *sh̄m*-scepter without a papyrus umbel (criterion 41); and the presence of a figure in the central niche of the door (criterion 50). Because of all of these criterion, Manuelian⁹⁸ opted for the date suggested by Brunner and Wreszinski and proposed a date for the tomb in the Fifth Dynasty rather than in the Sixth.

Suggested date: Fifth Dynasty around the reign of Niuserre.

2.4 Evidence from family lines

As will be discussed later in the present study⁹⁹, three family lines can be traced in CEE: *sšm-nfr*, *k3-n-nzwt* and *sndm-ib*.

Three members¹⁰⁰ of the *sšm-nfr* family are buried in the eastern lines of CEES. Their tombs cover the period from the middle to the end of the Fifth Dynasty.

G 5270 *r^c-wr I* : The owner belongs to the third generation of the *sšm-nfr* family. He was presumably a son of *sšm-nfr I*. The serdab of this mastaba leans on the rear wall of G 5370 dated by seals to Neferirkare or a little later. Baer¹⁰¹ dated G 5270 consequently to the middle of the Fifth Dynasty.

Suggested date: middle Fifth Dynasty after Neferirkare.

G 5280 *ph-n-ptḥ*: The owner belongs as well to the third generation of the *sšm-nfr* family. Smith dated the statues from the serdab of G 5280 to the middle of the Fifth Dynasty, and Harpur¹⁰² dated the mastaba to the reign of Niuserre.

Suggested date: middle Fifth Dynasty after Neferirkare.

G 5470 *r^c-wr II*: The owner belongs to the fourth generation of the *sšm-nfr* family. As mentioned above, in the serdab of G 5470 a graffito was found with a date (year of the 11th count). A seal with the name of Isesi originated from the same tomb and the tomb occupation was thus dated to his reign.

Suggested date: Isesi

Genealogical connections of the *sšm-nfr* family coupled with the sequence of building is an additional piece of evidence for the dating of *d3ty* (G 5370). The serdab of *r^c-wr I* (G 5270) was built against G 5370, and because *r^c-wr I* was a son of *sšm-nfr I* (G 4940), the date of

⁹⁸ MANUELIAN, "Redi-Nes" 55–78.

⁹⁹ See infra 144 ff.

¹⁰⁰ Excluding *s3tw* as the occurrence of his name in G 5480 is unlikely.

¹⁰¹ BAER, *Rank and title*, 97 (297).

¹⁰² HARPUR, *Decoration*, 266.

his tomb would perhaps be the reign of Neferirkare to Niuserre; G 5370 must date a little earlier than this. It is to be wondered whether *d3ty* is the same man as the similarly named son of *d3ty* depicted in his tomb G 7810 in the ECE. The parents of *d3ty*¹⁰³, the father, are completely unknown. Reisner considered him to be a grandson of Khufu and named, with no proof, *mr.s-ḥ* II as his mother, a hypothesis which was adopted by PM and Harpur. Strudwick¹⁰⁴ assumed, judging from the style of his mastaba which agrees firmly with the older mastabas of the ECE, that *d3ty* was one of the junior offspring of king Khufu, for whom additional mastabas had to be added to the original plan of the cemetery. Baud¹⁰⁵ finds the dating to the reigns of Khafre or Menakure possible because of the offering list and the decoration of the false door. Assuming that *d3ty*, owner of G 7810, was born in the later part of the reign of Khufu, his tomb and period of office may be dated to the end of the Fourth Dynasty. The dating of the father would support a dating of the son within the reign of Neferirkare.

Two members of the *k3-n-nzwt* family are buried in secondary tombs in CEES: *ir-n-r* (G 2156b) and *ḥ-m-r* (G 2156 c).

G 2156 b *ir-n-r* and G 2156 c *ḥ-m-r* : The two owners represent the two last generations of the *k3-n-nzwt* family. The dating of this family should start with the mastaba of *k3-n-nzwt* I (G 2155) which was dated by Junker, Reisner and Harpur to the early Fifth Dynasty according to its architecture and decoration¹⁰⁶. In the burial chamber of *k3-n-nzwt* II (G 2156) were found four pottery canopic jars which, according to Junker¹⁰⁷, are characteristic of the period after the middle of the Fifth Dynasty. Baer¹⁰⁸ dated *k3-n-nzwt* II to his period V D (Unas-Teti). Harpur preferred a dating in the reign of Niuserre for *k3-n-nzwt* II and between the reigns of Niuserre and Unas for his son *k3-n-nzwt* III¹⁰⁹. We should then calculate a generation for each of the following two mastabas. Though it is not possible to determine the duration of each generation, it would not be far from correct to estimate, like Junker, a date in the earlier part of the Sixth Dynasty for the latest tomb of this family, that of *ḥ-m-r*. Due to the bad state of that tomb it is not possible to draw any evidence about dating, but Junker remarked that similar frieze inscriptions occurred in mastabas of *k3-ḥif* and *k3i-m-ḥ*, both of which

¹⁰³ PM III, 204-5.

¹⁰⁴ STRUDWICK, *Administration*, (165).

¹⁰⁵ BAUD, *Famille royale*, 610.

¹⁰⁶ JUNKER, *Giza* II, 24 ff; REISNER, *Giza* I, 311; HARPUR, *Decoration*, 306.

¹⁰⁷ JUNKER, *Giza* III, 15.

¹⁰⁸ BAER, *Rank and title*, 294.

¹⁰⁹ HARPUR, *Decoration*, 270, 317.

date to the early Sixth Dynasty¹¹⁰. Baer agreed on a dating of *ir-n-r* to the early Sixth Dynasty¹¹¹.

Suggested dates: early Sixth Dynasty.

The CEEN contains the tombs of all the members of *sndm-ib* family, the building of which extended from the late reign of Isesi to the middle of the reign of Pepi II.

G 2370 *sndm-ib inti*: A damaged date within one of the letters of king Isesi to *sndm-ib inti*, which were engraved on the walls of his tomb, should be read either the sixteenth or the twenty-sixth count. Strudwick¹¹² concluded that the death of *inti* occurred at the very end of the reign of Isesi because of the presence of a cartouche of King Unas in a scene in his tomb, which may indicate that the finishing of the decoration was in his reign. *Inti* was depicted on the side walls of the portico of his tomb in the very long kilt worn by elderly men in the OK. One can thus roughly estimate the age of *sndm-ib inti* at the moment of his death by about 60 years old. He consequently would have been at the beginning of the reign of Isesi at his early 20s. Since *sndm-ib inti* does not relate his career in the early period of his life, it seems thus that his main career was indeed under Isesi.

Suggested date: Isesi

G 2378 *sndm-ib mhi*: was *im3hw hr* Isesi and Unas. Since *inti* seems to have died in an advanced age, and given the early age of marriage in ancient Egypt, one expects his son *sndm-ib-mhi* to be a man of middle age by the time of his father's death, which means he might have been born early in the reign of Isesi or even late in the reign of Menkauhor. The dating of the tomb of *mhi* to the middle-late reign of Unas is therefore reasonable.

Suggested date: middle-late reign of Unas.

G 2374 *hnm-inti*: A son of *sndm-ib inti* in the latter's tomb, and the younger brother of *sndm-ib mhi*, *hnm-inti* was active in the reigns of Unas and Teti, whose cartouches appear in his tomb. Considering his relationship to the other members of the *sndm-ib* family and his probable age, it is perhaps unlikely that he lived long into the reign of Teti most probably serving him and his predecessor as a vizier.

Suggested date: Teti.

G 2381 *nh-mry-r-mry-pti nhbw*: The biography of *nhbw*¹¹³ mentions Pepi I (*mry-r*) who appointed him to construction work in Upper and Lower Egypt. The tomb of *nhbw* was dated

¹¹⁰ JUNKER, *Giza III*, 15.

¹¹¹ BAER, *Rank and title*, 58 (51).

¹¹² STRUDWICK, *Administration*, 132-3 (120).

¹¹³ STRUDWICK, *Texts*, no. 198

by Harpur to Pepi I and by Strudwick¹¹⁴ to the period between the middle to the end of the same reign. If the speculation of Smith¹¹⁵ that *nḥbw* was a son of *sndm-ib mḥi* is correct, then the life of the two men must have overlapped at a reasonable period. Since the death of *sndm-ib mḥi* was dated above to no later than the late reign of Unas, the birth of *nḥbw* must be placed during the second half of the reign of the same king, thus being around 35 at the beginning of the reign of Pepi I. The building of his tomb within the first 15 years of the reign of that king seems thus more probable. Nevertheless, the missions mentioned within the biography of *nḥbw* which were assigned to him by Pepi I seem too long into fit in such a short period of time, bearing in mind that he spent 6 years in the mission of Heliopolis only. The junior age of *nḥbw* at the beginning of the reign of Pepi I is stressed by a part of the text which reads : his majesty found me originally just as one of the many builders, and his majesty appointed me as inspector of builders ,,etc. The text goes on to list important offices to which Pepi I assigned *nḥbw*. These offices seem indeed the most important to *nḥbw* and the ones that made his career. Moreover, *nḥbw* refers to the pyramid of Pepi I within the same text, which means the pyramid was already finished or near completion by that time. In addition to that, one of the Hammamat inscriptions¹¹⁶ of *nḥbw* is dated to the year after the 18th occurrence, 3rd month of *šmw*, day 27 of Pepi I. If the biennial system was still in operation at that point, the referred year would be the 37th of Pepi I.

Suggested date: Pepi I.

G 2381 A *Mry-rꜥ-mry-ḥnḥ-ptḥ pth-šps impy* : *impy* was depicted among the officials in the mortuary temple of Pepi II at Saqqara.¹¹⁷ The A seal impression of Pepi II was found by Reisner on a vase jar stopper in his burial chamber¹¹⁸. His name was mentioned in the text of his father *nḥbw* in Wadi Hammamat which is dated to year after the 18th occurrence of Pepi I. Brovarski¹¹⁹ found evidence from the destroyed serdab of *impy* that he held the vizierate during the long reign of Pepi II. *Impy* does not carry the title of vizier in the temple of Pepi II¹²⁰. The decoration of Pepi II's temple took place at the first third of his reign which will date the period of vizierate office of *impy* to a later period.

Suggested date: middle reign of the reign of Pepi II

¹¹⁴ STRUDWICK, *Administration*, 113 (90).

¹¹⁵ SMITH, *CAH I*, pt.2, 86.

¹¹⁶ SPALINGER, *SAK* 21, 303.

¹¹⁷ JEQUIER, *Pepi II ii*, pl. 46.

¹¹⁸ BROVARSKI, *Giza VII*, 34.

¹¹⁹ BROVARSKI, 'Sendjemib Complex at Giza', 115-121

¹²⁰ JÉQUIER, *Pepi II ii*, pl. 48 ; perhaps also id., *ocit III*, pl.35 (bottom right).

In addition to the above mentioned family lines, two other tombs are usually dated based on their family relations of their owners G 5110 and G 5230.

G 5110 *dw3-n-r^c*: due to its extraordinary size and position, the relationship of this mastaba to the original lines of CEE is problematic. In contrary to the 25 original mastabas, G 5110 has a core of type IV iii: a massive core with a recess for the interior chapel constructed ab origine. The X-casing used in G 5110 is not attested for any of the other original mastabas.

Reisner identified the owner with *dw3-r^c* who is mentioned in the chapel of his mother *mr.s-^cnh* III (G7530 sub). Strudwick¹²¹ refused this suggestion demonstrating the different orthography of names of the two persons, and proposed that *dw3-n-r^c* might be a son of Khufu. Because all sons of Khafre had rock cut tombs in the central field, and no known son of this king is buried in the WCE, Janosi¹²² agreed that the identification is weak. Strudwick dated *dw3-n-r^c* to the end of the Fourth Dynasty while Harpur¹²³ and Baud¹²⁴ opted for a date in the reigns of Khafre or Menkaure. Smith¹²⁵ dated the tomb to the end of the reign of Menkaure based on its decoration.

Suggested date: End of the Fourth Dynasty.

G 5230 *b3-b3.f*: Reisner¹²⁶ believed that he was a son of *dw3-n-r^c* (G 5110) without giving a particular justification for this suggestion apart from the location of his mastaba within the complex (G 5110, G 5230, G 5210, G 5220). Since G 5210 belongs to *hm-tn* who was involved in the service of the family of *mr.s-^cnh* III, Reisner may have assumed that G 5230 must belong to a member of the same family too. Though one of the titles of *b3-b3.f* has the phrase *n it.f* which usually refers to a real royal affiliation, Strudwick¹²⁷ proposed the possibility that *b3-b3.f* got this title through a promotion, because this is the only occurrence of such a title outside the recognised royal cemeteries at Giza. He thus dated *b3-b3.f* to the beginning of the Fifth Dynasty when true king's sons were being replaced in administrative positions.

Suggested date: early Fifth Dynasty

2. 6 Evidence from architectural elements

¹²¹ STRUDWICK, *Administration*, 162 (161).

¹²² JANOSI, *Giza*, 242.

¹²³ HARPUR, *Decoration*, 271.

¹²⁴ BAUD, *Famille royale*, 606-7 (248).

¹²⁵ SMITH, *History*, 164.

¹²⁶ REISNER, *Giza I*, 69, note 1.

¹²⁷ STRUDWICK, *Administration*, 82 (42).

G 2383 *wr-k3w-b3 ikw*: The small size of the offering room of G 2383 may reflect a very late OK date. The false door is also of very small size for a man with such a high title. One feature often found with doors of late date, the so called T shaped panel, is not evident here. The insertion of such a tomb among those of the *sndm-ib* family must presumably have been made later than the principal burials, the latest of which dates to the reign of Pepi II. For these indications Strudwick¹²⁸ suggested a date at the end of OK or later.

Suggested date: late OK.

hnt-k3w.s: Junker¹²⁹ considered many architectural elements in the tomb of *hnt-k3w.s* as indications that this tomb was built in the latest period of the OK, in the Sixth Dynasty. The division of the superstructure in rooms, as happens here, had been begun earlier in Saqqara, but in Giza the solid block of the superstructure was maintained longer. The insertion of shafts in the chapel, which occurs in this tomb, was begun in Giza only since the end of the fifth Dynasty. The location of the burial chambers of shafts suits a date in the late OK as well. Only the main shaft S 835 had the chamber to the south according to the old habit. S 835 A on contrary had its chamber in the east. The normal location of chamber was avoided for S 835 A because shaft S 835 was too near.

Suggested date: late OK.

tn3: Junker¹³⁰ put the tomb of *tn3* in the same time frame like *hnti-k3w.s*, the later OK, because of the statue recess which was found in the wall of the shaft. All cases of an underground rooms for statues date back to the end of the OK or the FIP.

Suggested date: late OK.

G 5550 *nfr idw I*: The false door of G 5550 is of the type with cornice and torus molding. This door has the small apertures typical of the Sixth Dynasty. Strudwick¹³¹ paralleled the general appearance of the false door with those of *mrri*¹³² and *mhw*¹³³ of Saqqara, both belonging to the middle of the Sixth Dynasty. Baer¹³⁴ dated this tomb to his periods VIB-C, E-F (middle reign of Teti to middle reign of Pepy II). It would seem that, as most of the

¹²⁸ STRUDWICK, *Administration*, 81 (40).

¹²⁹ JUNKER, *Giza* VII, 88.

¹³⁰ JUNKER, *Giza* VII, 88.

¹³¹ STRUDWICK, *Administration*, 68 (22)

¹³² PM III, 607-8.

¹³³ PM III, 619-22.

¹³⁴ BAER, *Rank and title*, 62 (78).

viziers of Teti and the later reign of Pepi II were buried near the respective pyramids, the period of the reign of Pepi I to early Pepi II would be the most likely for this man.

Suggested date: Pepi I to early Pepi II

G 4941 *pth-*iw.f-ni**: The owner was a *hnty-š* in the pyramid of Pepy I, the name of the king being thus a terminus ante quem non. This agrees with the position and shape of the serdab which are not usual for the early OK, but rather similar to that of *idw* II, dated by Junker to the Sixth Dynasty¹³⁵.

Suggested date: Sixth Dynasty.

2. 7 Evidence from typological classification: Dating the secondary mastabas by seriation

A large number of secondary tombs were classified by Reisner using his uniform topography. Though Reisner classified mainly the tombs which he excavated, he also included some of the tombs which are located within the German excavation area within his classification. Map 3.3 shows the distribution of features (complete tombs and their elements) which were classified by Reisner's system and which were consequently entered into the Winbasp software.

It is worthy of mention however that the ideal case of a tomb with complete classified features does not occur. More frequent is a lack of classification of one or more elements. Though the incompleteness of data is a serious problem, no statistical method for handling missing data was used, easiness of analysis being not the only reason involved¹³⁶. Since the number of features and types is large, it can be assumed with reasonable confidence that trends can be traced in spite of the occasional missing data. For the purpose of a cross-check, the 25 original tombs of CEE were also included in this seriation attempt.

The total number of types was 181 covering the following points:

- 1- Types of mastabas.
- 2- Types of chapels.
- 3- Features of decoration classified by Harpur¹³⁷.
- 4- The presence of serdabs.

¹³⁵ JUNKER, *Giza* VII, 24.

¹³⁶ Conventional methods for handling missing data, like list wise deletion, regression imputation or waste data sacrifice power and can yield biased estimates of parameters and standard errors. RODERICK and RUBIN, *Statistical Analysis with Missing Data*, 10.

¹³⁷ HARPUR, *Decoration*, 355-376, tables 7-8.

- 5- Types of original shafts (intrusive shafts¹³⁸ were excluded because they represent several later stages of dating).
- 6- Types of burial chambers of original shafts.
- 7- Orientation of burial chambers.
- 8- Types of blocking of burial chambers.
- 9- Burial position of bodies.
- 10- Names of kings which occur in the tomb.

The outcome of the seriation attempt was represented in graph 3.2. Optically it was possible to recognize two groupings of tombs at the ends of the seriation graph: the 25 original mastabas of the three En Echelon lines at the right edge, and the group of tombs represented on map 3.4 at the left end. Worthy of attention is the position of G 5110 within the first group. The typological classification of features places that tomb chronologically in the middle of the tombs which are agreed to be dating to the second half of Fifth Dynasty.

No other assemblage of tombs between those two groups was recognizable by direct inspection. Nevertheless, when the tombs were represented on map 3.5 according to the value of their order on the seriation graph¹³⁹, with the lighter colours representing the lower order, the general chronology of the area was manifested clearly. Again the CEES seems in general earlier than the CEEN. A number of tombs in the southeast corner of CEES appears however to be more or less contemporary with the *sndm-ib* complex. Among those tombs is G 5330 which was dated by Baer¹⁴⁰ to his period VI B, D-F (Teti, first 3rd of Pepi I).

The order of tombs within CEEN shows nevertheless some discrepancies with the points discussed about the cemetery so far. The *sndm-ib* complex for example seems to have been attributed a relatively later date in comparison with the neighbouring tombs. Excluding some few tombs which had existed in the area, that family complex is believed to have been the earliest in CEEN. Moreover, the scenario of extension of building activities, discussed above in association with the point density maps¹⁴¹, suggested that CEEN grew towards the west extending beyond the earlier line of tombs G 2440-G 5280, and turning later to the southwest, which was the latest part of the cemetery. Finally the proposed tomb of the son of

¹³⁸ Reisner identified often intrusive shafts, either by stating directly that there were intruded later or by assigning them letters from the end of the Alphabet „X, Y, Z.

¹³⁹ The order of each tomb on the seriation graph was entered as a serial number in the attributes of the tomb in the geodatabase.

¹⁴⁰ BAER, *Rank and title*, 59 (56).

¹⁴¹ See supra p. 35 ff.

sndm-ib inti, *ftk-ti* G 5560 is arranged in position 52, while the tomb of his father is assigned the much later position 225.

On the other hand, the seriation attempt assigned proper positions to the tombs of the members of *sšm-nfr* family, except in the case of the sons of *sšm-nfr* I, *r^c-wr* I (G 5270) and *ph-n-ptḥ* (G 5280), who were both assigned an arrangement later than the next generation of that family. The table below shows the positions of each of the family's members on the seriation graph 3.2.

Tomb	Arrangement
<i>sndm-ib</i> family	
<i>sndm-ib inti</i> (G 2370)	225
<i>sndm-ib mḥi</i> (G 2378)	235
<i>hnm-inti</i> (G 2374)	241
<i>ftk-ti</i> (G 5560)	52
<i>nḥbw</i> (G2381)	239
<i>sšm-nfr</i> family	
<i>ssm-nfr</i> I (G 4940)	12
<i>r^c-wr</i> I (G 5270)	27
<i>ph-n-ptḥ</i> (G 5280)	76
<i>nzwt-nfr</i> (G 4970)	19
<i>sšm-nfr</i> II (G 5080)	21
<i>sšm-nfr</i> III (G 5170)	22
<i>ptḥ-ḥtp</i> (G 5480)	30
<i>r^c-wr</i> II (G 5470)	31

2. 7.1 Moran's I and Hot Spot analysis of seriation outcome

To test the overall validity of this seriation process, Moran's I statistic was carried out for the tombs of CEE represented on the seriation graph 3.2, using the seriation serial number as the input field. The outcome has revealed that tombs cluster spatially according to the values of the input field. This result suggests the general validity of the seriation outcome in spite of the single discrepancies of the order of some tombs with the dates suggested for them in the above discussion.

Tombs of CEES (tombs of the original lines and the smaller tombs between them) showed either too high or too low Z score values when Hot spot analysis was carried out (map 3.6), which indicates the strong association between the value of the input field (seriation serial

number) for the nearby tombs. Tombs in CEEN on the contrary had a Z score near zero which indicates that neighbours have a wide range of values.

This outcome might assure the commonly accepted idea that the tombs of the original lines of CEES were built first, and may suggest that the smaller tombs between them followed by a short inversion of time. The tombs of CEEN on the other hand, showing little homogenisation in the values of their serial numbers on the seriation graph, seem to have extended over a longer period of time.

2.8 Evidence from sequence of building

Tombs in the areas to the east and north of the three original lines, though placed irregularly in most cases, can occasionally be arranged into north south lines. That arrangement was not, however, due to a uniform plan, but rather to the relations between the owners of those small tombs or to the limitations imposed by the regular shape of the older rows of tombs.

The earliest additions to the CEE included large mastabas which shaped the layout of the area. Both Junker and Reisner agreed that such additions began from the south and were initiated by the mastaba G 5110. That large mastaba formed the nucleus of a group of intimately related mastabas when three other smaller mastabas were constructed: G 5210 and G 5220 to the east and G 5230 to the north. Also added relatively early were the two connected mastabas G 5340 and G 5350, which appear not to be related to the first group, and the mastabas in front of the tomb of *sšm-nfr* III (G 5170) whose owners are related to the same large family. Between the three En Echelon rows and the row G 5340-5370 there is a 21 m wide space, which is filled in the north with the large mastabas G 5270 and G 5280 and in the south with other smaller tombs.

Only north of the G 5110 group can the uniformity of a regular line be noticed. The front side of G 5340 is almost in line with the *Vorbau* of G 5230 and G 5350. G 5370 follow the same front line of the last two mastabas. To the east of the row G 5340-5370, one can notice another parallel row of mastabas which preserves the same distance from the pyramid enclosure: G 5460, S 677-817, G 5470.

The two excavators of CEE, Reisner and Junker, explained the sequence of building discussing groups of tombs which have areas of intersections between them. The relative dating of those groups of mastabas in comparison to each other is often difficult to ascertain from their publications. There are moreover areas of the cemetery which were neither discussed by Reisner nor by Junker.

2.8.1 Sequence of tombs as proposed by Junker

Within his publication for the central area of CEES, Junker often determined the relative dating of neighbouring tombs by recognizing three phenomena:

- 5- The tendency of later tombs to use the outer walls of the older ones to save the expenditure of one or more walls .
- 6- Earlier mastabas tended to follow the lines which had been created by the older ones.
- 7- Constructions which blocked the access to older mastabas should be later in date than those which preserved their access, because blocking of access meant the interruption of service in the older mastabas and the ceasing of their functionality.

Based on the above mentioned points, Junker made many scattered remarks about the sequence of building in the area of tombs which is published in his volumes Giza VII and VIII. The observations of Junker can be used to classify tombs in the study area into 14 groups designated on map 3.7 as A, B, C, D, E, F, G, H, I, K, L, M, N, O.

Group A: mastabas to the east of G 5160

To the east of G 5160, in the third En Echelon row, many medium sized and small mastabas were built. *ḥwfw-snb* I was the first to insert his mastaba into that space. His tomb occupies the north part of the area, leaving a passage of 3 m between it and G 5160, most likely to preserve its access.

The chapel of G 5160 was however later blocked by tomb S 347-348 which was most probably the next building in this area. S 347-348 was itself blocked by other buildings later when the road was violated in the north by the mastaba of *nsw-ḳdw* II and S 349-352, in the east by mastabas S 342-343, S 344-345 und S 346, and in the south by *pth-špss* I. The latter tomb has left a narrow passage in the street according to its first plan, but then a serdab which blocked the road was added.

It is to be noted that *nsw-ḳdw* II used the space between *ḥwfw-snb* I and G 5160, saving for himself the building of the two long walls and adding only the short walls on the north and on the south.

Next, a small tomb, S 359, was inserted into the northwest corner of the mastaba of *nsw-ḳdw* II retreating a little bit from the west wall of its chapel. It seems that a part of the wall of S 359 was removed to give the impression of integration with the older tomb. Finally mastaba S 342-343 was added on the south wall of S 344-345.

The sequence of building in group A can be summarized as the follows:

1-*ḥwfw-snb* I

- 2- S 347-348
- 3- *Nsw-ḳdw* II
- 4- 349-52
- 5- S 359
- 6- *Pth-špss* I
- 7- S 344-345
- 8- S 342- 343

Group B: To the east and south of group A

Tomb S 450-490 leans on the south side of *hwfw-snb* II. Between *hwfw-snb* I and II a long rubble-stone mastaba S 371-374 was built. Later an extension, which contained shafts S 372, 373, 371, was added to it. Another narrow tomb joined the last mastaba from the south with shafts 375-391, using the rear wall of S450-490. Next S 378-379 joined S375-391 from the south.

The south end of S 466-467 leans on the tomb of *tnti* and S 457-79 leans on the north wall of the later mastaba. *sš3t-ḥtp* II inserted his mastaba to the space between S 378-379 and S 457-479, and for this reason the mastaba has a rather irregular shape.

The sequence of building in group B can be summarised as the follows:

- 1-*hwfw-snb* II
- 2-S 450- 490
- 3-S 371-374
- 4-S 375-391
- 5-S 378-379
- 6-*tnti*
- 7-S 466-467
- 8-S 457-79
- 9-*sš3t-ḥtp* II

group C: To the east of area B

The north *Vorbau* of G 5350 leans on the southwest corner of G 5460. Mastaba of *st-k3* and *pth-ḥtp* leans on the west wall of G 5460.

The sequence of building in group C can be summarised as the following:

- 1-G 5460
- 2-G 5350

3-*st-k3* and *pth-ḥtp*

Group D: To the east of G 5280

The building of tomb S 527-546 is not clear. But it seems it was planned as a small building which was extended later until the south west corner of mastaba G 5380. Only two shafts belong to the core , one of them 527 leans on the G 5380. The rest of the building was intrusive and inserted later. Tomb S 402-545 leans on S 527-546.

The sequence of building in group D can be summarised as the following:

- 1-G 5380
- 2-S 527- 546
- 3- S 402- 545

Group E: The street between G 4950 and G 4940

The street which separates G 4940 and G 4950 is narrower than the other east west streets of the section because *sšm-nfr* I cased G 4940 with a wider casing than usual. That location was attractive for building a tomb because the south and north walls were already there. The space was used in the beginning of Fifth Dynasty by one of the relatives of *wnšt* (S 984), and into this building *pth-iw.f-ni* (G 4941) inserted his mastaba in the end of Sixth Dynasty.

- 1-S 984.
- 2- G 4941.

Group F: In front of G 5040

S 900-902 uses the southern outer wall of S 896-899.

- 1-S 896-899
- 2-S 900-902

Group G: to the east of G 5140

The chapel of G 5242 is located in the north. This position in the north is worthy of attention and might be explained by the late date of the mastaba. The space between G 5241 and the mastaba to its west, G 5242 is too narrow. The small distance is contrary to the usual habit of leaving the east side of the mastaba free to enable the rituals. But the little distance between the two mastabas can be explained if one assumes that G 5241 was built first.

- 1-G 5241
- 2-G 5242

Group H: The street between G 4960 and G 4970

The sequence of tombs in the street between G. 4960 and G 4970 is still possible to determine with some certainty. Junker believed that three tombs in this area belong to one family: S 2064-2130, S 2138 a and S 2131-2134. He assumed that S 2064-2130 was built first because it leans on the middle of the north wall of G 4960.

Later tomb S 2138 a was laid out. So that the service in S 2064-2130 would not be interrupted, a small distance was left leaving a narrow passage in front of the later mastaba. In S 2138 a a small cult room was inserted in the east which violates a little bit the northeastern corner of G 4960.

Between the north wall of S 2064-2130 and G 4970 tomb S 2131-2134 was built. Probably it belongs to the same family because it is followed the same west line of S 2131-2134, although it would have been wiser to extend the building a little bit to the east instead of violating the south west corner of G 4970. The unnumbered building in front of S 2131-2134 must be a later intrusive addition because it blocked the access to the false door of S 2064-2130. Its east wall was built of stones taken from G 4970, and from the neighbouring mastabas in the west and south. S 2135 leans on the north end of S 2138 a. The totally destroyed back wall was probably lined with the west side of the neighbouring tombs. S 2137/2140 left a passage between it and the south wall of G 4970, so that the access to the mastabas west of it will be kept free. That passage was only blocked later with a shaft.

A possible order of construction of tombs in this area is :

- 1- S 2064-2130.
- 2- S 2138 a.
- 3- S 2131-2134.
- 4- S 2135 .
- 5- S 2137-2140 .
- 6- The unnumbered building in front of S 2131-2134.
- 7- The shaft north of S 2137-2140.

Group I: to the east of G 5060

Tomb S 411-413 leans on the south wall of the mastaba of *snfrw-nfr*. S 639 leans on the south side of S 411-413.

- 1-*snfrw-nfr*
- 2-S 411-413
- 3- S 639

Group K: G 5350 and the mastabas to its east

The north *Vorbau* of G 5350 leans on the southwest corner of G 5460. G 5460 was thus erected before the finishing of G 5350. On the other hand, the tomb S 766a -766b leans on the south wall of G 5460. The plan of 766a -766b is not usual. One would expect that entrance should be from the east side, where, at the time of building, a free space was available to which access was allowed from the north, even if the mastaba S 766 already stood at that time. But instead of that the front of S 766a -766b was located on the south, where the entrance is located on the east end.

In the angle between G 5460 and S 766 the oldest tomb is S 754-755. Further to the south and in the corner between S 766 and G 5460 a double tomb, S 756-757a, was inserted. To the east, two medium sized tombs, G 5550 and G 5560 were constructed so that their west walls are aligned together. Both tombs should be considered earlier than the small tombs around them because of their regular arrangement and shape. The serdab of mastaba S 757 leans on the south wall of G 5550. There are several later shafts between G 5460 and G 5560. Junker arranged those in two tombs: S 729-729c and S 710-739. The cult room of *k3-nfr* III is inserted between the east wall of mastaba G 5350 and the west wall of S 766a-766b, using the south wall of the *Vorbau* of G 5350. Later another tomb, S 756-757 a, was inserted into this area

Mastabas in this group were most likely built in the order:

- 1- G 5460.
- 2-G 5350.
- 3- G 5550, G 5560.
- 4- S 766a-766b.
- 5-*k3-nfr* III, S 766.
- 6- S 754, 755.
- 7- S 757.
- 8- S 756-757a, S 729-729 c, S 710-739.

Group L: G 5470 and the mastabas to its southeast

Mastaba S 677-817 uses the south wall of G 5470, almost over its full length. Its eastern wall runs in the same line like the older mastabas. That was obviously to create a regular row from G 5470 until S 794. While the main building of G 5470 is older than the S 677-817, the serdab of the former leans on the northern wall of the later which means that additions were

made to G 5470 later than the construction of S 677-817. *hnt* used the south wall of G 5470 and the west wall of S 677-817.

Mastabas in this area were probably built in the order:

- 1-G 5470
- 2-S 677-817
- 3-*hnt*

Group M: Mastabas north-east of G 5470

The mastabas S 508-658, G 5610 and S 501-589 kept almost the same southern line as if the owners wished to preserve the east west street between G 5610 and G 5470. S 494-498 on the contrary advanced towards the south which means that it is later than S 508-658.

In the southwest of S 508-658, a little tomb S 497 was added. S 496 is one of the latest tombs in this area because it blocks the road between *nht* and S 508-658.

A possible order of construction of tombs in this area is :

- 1-G 5610, S 508-658, S 501-589.
- 2- S 494-498, S 497, S 596.
- 3- 496.

Group N: Mastabas east to G 5470

The older part of S 665-673 is leaning in south against the tomb of *nh-wd3 iti*. S 660-661 is built so that the eastern wall would align with that of *nh-wd3-iti*.

- 1-*nh-wd3-iti*.
- 2- S 660-661, S 665-673.

Group O

G 5270 must be later than G 5370 because the serdab of the former uses the rear wall of the later. Though the core of G 5170 is certainly earlier than both tombs, the later additions in G 5170 (pillared hall and serdab hall) used the rear wall of G 5270.

- 1- G 5370
- 2- G 5270
- 3- The completion of G 5170

2.8.2: Sequence of tombs as proposed by Reisner

Reisner explained the sequence of building areas of tombs in CEEN and CEES, basing his conclusions on three principles:

- 1- The large mastabas on independent sites were earlier in date. The mastabas thus marked out by their size and their setting, were examined for internal evidence of their dates.
- 2- Small mastabas on independent sites may be earlier or later in date, and were considered individually.
- 3- The determination of the chronological order of other mastabas depends also on their relation to each other. In groups of mastabas which stand in contact, the order is usually made clear by the nature of contact.

The sequence of building as described by Reisner can be classified into 10 groups, represented on map 3.8 as 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.

Group 1 : The area to the east and south of G 5230¹⁴²

A-Three large mastabas were built on independent sites G 5230, G 5330, G 5332.

B- Then smaller mastabas were inserted between these three in the following order:

- 7- G 5232 was built on an independent site.
- 8- G 5235 and G 5233 were built contemporary to each other.
- 9- G 5234 was built against the south end of G 5235
- 10- G 5331 was added to G 5332
- 11- Two sloping passage tombs were excavated: one in front of G 5234 and one in front of G 5235 (G 5235 E).
- 12- G 5236 and G 5237 built against its western wall later.
- 13- G 5231.

The chronology of the 3 mastabas to the south of G 5232 is unclear. G 5228 and G 5221 seem to have replaced older mastabas, one of which Reisner numbered G 5229 (not represented on the map). However the fragmentary condition of these two mastabas did not allow any conclusions concerning the sequence of their building.

The same can be said concerning the three badly denuded mastabas: G 5241, G 5242 and G 5243, west of G 5237

¹⁴² REISNER, *Additions*, 32.

Group 2: The group of mastabas based on G 5340¹⁴³

1- After the construction of G 5230 and by inference of G 5110, G 5210 and perhaps G 5220, two large mastaba were constructed north of the interior chapel of G 5230: G 5340 and another mastaba built after the latter: G 5350. Both were apparently built before any secondary mastaba around them had been constructed. The relation in time to the large mastabas with decorated chapels in CEE is not easy to determine, but G 5340 is clearly later than the early tombs (G 5080, G 4940) of the *sšm-nfr* family.

2- G 5460 was built on an independent site.

3- In the remaining space east of G 5350 and G 5460, the two largest mastaba are G 5560 and G 5550. Both are on independent sites.

4- Small mastabas between the last two

5- The mastabas G 5236, G 5332, G 5334 are later in date.

To the east of G 5210 and G 5220, the depression in the rock and the character of the ground prevented any large mastaba being built.

Group 3: The northern group of large mastabas added to CEE east of G 5170, G 5180, G 5190 and around them.

In the northern part of the area east of the CEE, four main lines of mastabas may be traced: G 5200, G 5300, G 5400 and G 5500.

1- The earliest 2 mastabas are G 5270 and G 5280.

2- East of the two mastabas G 5270 and G 5280 are a group of large and medium mastabas which are irregularly placed but based on one or the other of these two mastabas. These are: G 5370, G 5470, G 5380, G 5480.

3- Surrounding those on the east and west are lesser mastabas which are later in date.

4- The compound mastaba G 2336-2335 was built on an independent site in the space between G 2340 and G 2330. It appears that G 2336 was built first.

Group 4: Mastabas based on G 5520

A large number of medium sized and small mastabas were based on the mastaba of *s-ḥnh-ptḥ* (G 5520): G 5510, G 5511, G 5512, G 5521, G 5522, G 5523, G 5524, G 5530, G 5540, G

¹⁴³ REISNER, *Additions*, 45.

5541, G 5542, G 5551, G 5552, G 5553, G 5554, G 5555, G 5561, G 5562, G 5563 and G 5564¹⁴⁴.

Group 5: The group based on G 5480 and G 2337

The general line of growth in this area was from west to east, but it is difficult to arrange all the mastabas in chronological order of their construction. The group is based on G 5480 and the mastaba G 2337 and later than those two mastabas which are built on rock.

1- G 5481 was built against the east face of G 5480 and enclosed the east corner of G 2337.

2- Directly in front of G 3337, on an independent site was built G 5510 and the two mastabas G 5481 and G 5510 appear to be the earliest of the structures in the area under discussion, but G 5510 is built on debris and later than 2337.

3- The next mastaba appears to be G 5520. About the same time or even before G 5520, G 5610 was built. Also contemporaneous with G 5520 was constructed G 5540. The relation between the stages of the construction of G 5520 and G 5540 were quite clear:

1) G 5520 nucleus

2) G 5540 nucleus

3) G 5520 exterior chapel

4) G 5540 exterior hall of pillars

5) The reinforcement of the south and east walls of G 5520.

4- Probably before 5520 and 5540 were finished, G 5530 was built against the east face of G 5481

5- Later a number of small subsidiary mastabas were built against these mastabas and on the east of them up to the retaining wall of the cemetery.

6- Still later similar small mastabas were built on the surface of debris of the larger mastabas and other mastabas inserted north of the west corner of the pyramid enclosure.

Group 6:

1- G 2350 was built and the field continued eastwards under the site now taken by G 2370. Excavating the interior of G 2370 in the southwest quarter, at least two small mastabas underneath which had been ruthlessly overbuilt were found. It seems clear that the whole area northwards as far as the north edge of the *sndm-ib* complex was already covered with small mastabas before the complex was begun.

¹⁴⁴ REISNER, *Additions*, 56 j. also mentioned the numbers of two other tombs which are located far from this area: G 2362, G 2363. Most probably this is a mistake.

2- The next large mastaba was G 2360.

3- After G 2360 two medium sized mastabas were constructed between G 2350 and G 2360, first G 2352 and then G 2353

4- G 2356 and G 2351. The spaces west of G 2352-3 and the corridor chapel of those two mastabas were filled with intrusive shafts.

5- The small mastabas built against the south end and the east face of G 2360 were later in date, but were probably the tombs of descendants and other relations of the same person *shmk3*. The order of construction of the small mastabas is problematic. Reisner suggested G 2361, G 2365, G 2362, G 2366, G 2364 and finally G 2363.

Group 7: Mastabas added along the north edge of G 2170 and mastabas north of G 4990, G 5090, and G 5190

The main line of growth in this space was the following:

1- The first mastaba in this area was G 2172.

2- Against the south end of G 2172 was built the small mastaba G 2169 and against its north end G 2175. G 2178 was contemporaneous with G 2169.

3- Against the north end of G 2175 was built G 2177 and against its back the little structure G 2176.

4- Immediately to the west of this line, the following mastabas intruded: G 2171, G 2173. G 2174

5- The line in which stands G 2169, south of G 2172, is continued southwards by G 2168, G 2166, and G 2165. G 2168 appears to be earlier than G 2169.

6- The small mastabas G 2161, G 2162 and G 2163 are built against the south end of G 2170 and are probably later than the mastabas G 2165-2169.

Group 8: The constructions north of G 2180 based on G 2172

1-G 2184 which formed the nucleus of the complex G 2184, G 2186, G 2185.

2-G 2197, which formed the nucleus of the complex G 2197, G 2196 and G 2198.

3-G 2187, which seems to have been the tomb of an important person

4-G 2172 forms the nucleus of a complex of related mastabas G 2175, G 2177, G 2178 and G

5- G 2179. The nucleus of G 2172 was built first and then the nucleus of G 2175 built against it. Then additions were added to both of them. At least three constructions containing only shafts were added to the complex later: G 2176, G 2175 and G 2178. G 2177 was built nearly

at the same time as G 2172 and G 2175, and additions were made also at the same time. The nucleus of G 2177 was built before the addition to G 2175. G 2178 was still later.

Group 9 Mastabas north of G 2350 and G 2360 (Cemetery G 2400)

The main mastabas in the east west row north of G 2360 and G 2371 are in order:

1-G 2414,

2-G 2412,

3-G 2413,

4-G 2411,

5-G 2409.

The relation of G 2415 to this group is not clear but it is probably later than G 2414.

Group 10: The *sndm-ib* complex

A- Mastabas and sloping passage tombs

Reisner assumed that CEEN was an extension of the eastern lines of CEES. The CEEN was initiated by G 2360 and then grew eastwards. Several smaller mastabas had been built before the initiation of the *sndm-ib* complex (G 2371, G 2372, G 2373, G 2375, G 2414).

The underlying rock under the complex has an uneven surface with a general slope from west to east. G 2337 stands on the rock, but east of that mastaba the rock is covered by debris about a meter and a half deep sloping also from West to East and covering the uneven rock. Along the south side of G 2370, the surface of the layer of debris rises about 0,75 m above the foundation course of that mastaba. This means that the deposit was laid down partly before the construction of G 2370 and partly later. All the mastabas in this area are built on a surface of a layer of debris and after the construction of G 2370¹⁴⁵. To build the nucleus and first mastaba in the complex, that of *sndm-ib inti* G 2370, many older constructions were violated. The eastern part of an older mud brick mastaba (G 2371) was cut away, and the west wall of the mastaba of *inti* was built inside its east wall. Reisner gave the number G 2372 to some remains of walls inside G 2370, but Broverski believed that these remains might be the east wall of G 2371. Within G 2370 and parallel to the presumed face of G 2371/2372, at a distance of 60 cm, ran a wall of small nummulitic limestone blocks forming the back wall of another older mastaba (G 2373). The front part of this mastaba was destroyed by the construction of the interior chapel of *inti*. Part of a wall that probably belonged to an older

¹⁴⁵ REISNER, *Additions*, 56 j.

mastaba was also discovered by Reisner under the floor at the western end of the pillared hall of G 2370. After the construction of G 2370 and in the later part of the reign of Isesi, the sloping passage tomb G 2370 B was excavated

The next construction in the *sndm-ib* Complex was the mastaba of *sndm-ib mḥi* (G 2378). Then the sloping passage tomb G 2378 A was excavated. At the time G 2378 was built, an older mastaba belonging to a man named *ḥt-mḥw* (G 2375), who had no apparent connection with the *sndm-ib* family, stood in the northwestern part of this area.

The mastaba of *hnm-inti* (G 2374) was built between the north side of G 2370 and the southern side of the mastabas of *ḥt-mḥw* and *mḥi* with a strengthening of the south court wall of G 2375. The sloping passage tomb G 2378 A probably belongs to this mastaba. The date of the building of G 2378 is perhaps the reign of Teti.

Next, G 2385, a large mastaba without shafts, was constructed. The burial was presumably in the sloping-passage tomb G 2387 A. Reisner thought that the owner of the mastaba was a son of *sndm-ib*.

The next construction was G 2381, which was probably built in the reign of Pepi I. The chief burial place of this mastaba is the sloping passage tomb G 2382 A. According to Reisner, *nḥbw* was buried in the sloping-passage tomb G 2382 A.

Later, two additions (G2376 and G 2377) to the mastaba of *mḥi* were built on the west and closed off all access to *ḥt-mḥw*'s chapel. G2377 was built against the west wall of G 2378, with G2376 built against its own west wall.

G 2384¹⁴⁶ was next built on the pavement of the platform on the east side of the court. It may well have belonged to the elder son of *sndm-ib mḥi*, likewise named *sndm-ib*, who is depicted in his father's mastaba.

On the platform east of G 2381 and south of the ramp approach to the court was built the badly denuded mastaba G 2390¹⁴⁷. Shaft G 2390 A, which was found open and plundered by Reisner, may have belonged to this mastaba.

¹⁴⁶ I placed G 2384 in this position in the building sequence according to BROVARSKI, *Giza VII*. Reisner does not mention it within his sequence.

¹⁴⁷ The numbering of constructions in the area to the east and south of G 2381 is confusing. REISNER (*sndm-ib*, 128 (12)) mentioned a tomb numbered G 2381-a, on lower level east of G 2381 and south of its serdab and the ramp approach to the court. He attributed to it shafts G 2381 Z, G 2381 A and G 2381 C. In shaft G 2381 A *impi* was buried and was dated to the reign of Pepi II. BROVARSKI (*Giza VII*, note 43) assigned the number G 2390 to the area east of G 2381, which contained a denuded mastaba since the false door of G 2390 is still to be seen in situ. GA and Brovarski mention a shaft numbered 2381 b, but it is not labelled on the map

Three smaller tomb chapels were also set up on the pavement of the platform probably in the second half of the reign of Pepi II. G 2383 was built against the south face of G 2378, west of the portico, and two others, G 2386–a and b, between G 2384 and the sloping entrance ramp.

Outside the complex proper, on a much lower level to the north of G 2385, was constructed the mud brick mastaba G 2379 (anonymous), and north of this was built G 2391, a small mastaba belonging to a family of priests of the *sndm-ib* family.

Other priests and servitors of the *sndm-ib* family had tombs in the immediate environs to the south and west of the complex (G 2337, G 2338, G 2361, G 2362, G 2364, G 2366, G 2396, G 5551, G 2347], 5554 etc.) Reisner believed that the smaller mastabas of the *sndm-ib* complex together with the tombs of the funerary priests beside it may well be nearly the last in the Giza cemetery prior to the intrusive burials of the Saite and Roman Periods. According to him, the official cemetery fell into disuse during the time of Pepy II or his successors of the late Old Kingdom, through the dissolution of earlier endowments or their diversion to other uses.

Shaft G 5562 A rises above the masonry of G 2370 and the platform of G 2381, and appears to be later than either. By its type and position Reisner assigned it to the period late VI or early VII.

B-The paved court

The paved court of the *sndm-ib* Complex is 2 m higher than the rock east of the complex. The east wall of the paved area was formed by a retaining wall of heavy rubble with a batter on the east, and the sloping ramp from the floor level of the court to the lower ground led down between two low walls. Along the retaining wall were five large sloping-passage tombs, G 2370 B (*sndm-ib inti*), G 2381 A (*impy*), G 2382 A (*nḥbw*), G 2385 A (*ḥnm-inti*) and G 2387 A (owner of G 2385?).

The foundation platform of the open paved court was constructed in two or three stages:

1-Initially it was built after G 2370 extending from the south end of G 2381 to the south end of G 2385 and forming a rectangle wider in front of the north half of G 2370. The court was crossed by a paved path which led from the entrance of G 2370 to the sloping ramp down to the pyramid plateau.

2- Thereafter *inti*'s sloping passage tomb (G 2370 B) was excavated under the platform and the platform extended eastwards by a rubble wall filled with limestone. Apparently at the same time, or after the burial of *inti*, the platform over his burial place, including the new addition to the platform, was surrounded by a wall on all four sides.

3- The pavement of the court was extended northwards to the face of G 2378 and the sloping passage G2378 A.

4-Next, the old platform was extended northwards north of G 2384 along the eastern side of G 2378 to near its northeast corner. The space east of G 2378 was filled with clean limestone debris retained by two parallel north– south rubble walls about 4 m east of G 2378. On this extension was constructed a large mastaba without shafts, G 2385. Burial was presumably in the sloping-passage tomb G 2387 A. Reisner thought that the proprietor of the mastaba was a son of *sndm-ib mhi*.

C- The drainage channel

The rock surface east of the foundation platform of the *sndm-ib* complex was rough and may well have been a quarry floor¹⁴⁸. Reisner dated the cutting of stone which left the rock scarp on the east of G 2378 to the Khufu period. A drainage canal was leading from the northwestern corner of the pyramid along the eastern border of the cemetery. This drain was intended to draw off rainwater from the low ground EW of the pyramid end and it was contemporaneous with the completion of the pyramid. Reisner assumed that it was cut and constructed in the “late Khufu period.” Where it passed under the enclosure wall of the pyramid, the channel was carefully roofed. A smaller channel was constructed inside the rock-cut drain with slabs on the two sides and a slab roof bound with gypsum. The drain was intended to draw off rainwater from the low ground northwest of the pyramid. The water was, in fact, a danger to the burials in the sloping passage tombs, and in two cases, G 2385 A and G 2387 A, where the upper end of the sloping passage cut into the drain, the channel was blocked with masonry on both sides. In the case of the intact tomb G 2381 A , water had run in down the sloping passage and collected in the southwest corner of the chamber.

¹⁴⁸ REISNER, *sndm-ib*, 127.

Chapter Four
Family and Service Relationships in CEE

1- Kinship in CEE

1- A The evidence of kinship ties between tomb owners

In spite of the common remarks concerning the tendency of family members to be buried next to each other during the Old Kingdom, attempts to reconstruct genealogies of families in OK cemeteries are faced by several obstacles¹. Not only are most of those tombs undecorated, as in the case of CEE, but also many of the decorated ones depict the owner and his wife only, with fewer examples of scenes showing sons and daughters. Even when sons are depicted within such scenes, the father usually records the titles obtained by his children during his lifetime, which are usually the minor ones. Lesser attested even is the mention of the name of one or more parent(s) in the tombs of their adult children. Moreover, some words such as *sn* can be misleading to researchers since the last mentioned term might refer to *sn dt* whose correct meaning is (brother of the endowment), a function related to the cult maintenance of tombs. In addition to that, the similarity between personal names mentioned in two or more tombs alone is not a sufficient indication for establishing kinship ties since similar names of individuals occur often during the OK, especially towards the end of the period. Such a problem is more relevant to women than men, not only because some of their names are extremely common, like *hṭp-hr.s* and *mrt-it.s*, but also because women have rarely more titles than the traditional *rht-nzwt* and the priesthood of Hathor and/or of Neith. A problem particular to men in the context of kinship determination is the occasional use of the *rn nfr* without the main name of the person. Therefore no family relation between two similarly named owners will be assumed in the below discussion unless there are other pieces of evidence which support the claim such as the location of tombs, their styles or common titles between the individuals in question.

For the 116 known owners in CEE, 411 family members and dependents were depicted or cited in inscriptions. The genealogical relationships between those persons can be classified based on the evidence collected as the following :

A- The first and strongest evidence of family relation is when the owner, or one of his relatives, is mentioned in another tomb as the tomb owner or a member of his family. Occasionally this evidence is strong enough to render the kinship relation certain. However in most cases of common names which occur in two or more tombs it is difficult to establish

¹ HARPUR, *Decoration*, 13-17.

kinship ties without taking the dating of those tombs into consideration, an issue which lacks accurate determination in CEE.

1- *sšm-nfr III* (G 5170): He might be the similarly named person represented as the son of *sšm-nfr II* (G 5080) in the latter's tomb.

2- *hnwt-sn*: She was represented in the tomb of *sšm-nfr III* (G 5170) as his mother and in the tomb of *sšm-nfr II* (G 5080) as the wife of the latter. Another *hnwt-sn* occurs in G 4970 where she is represented as the daughter of the tomb owner *nzwt-nfr*. A fourth *hnwt-sn* is depicted as the daughter of *ḥnh-wd3 iti* in his mastaba. The last two occurrences are not to be associated with the first two for dating reasons.

3- *mrt-it.s*: There are 7 occurrences of this name in CEE for mothers, wives and daughters of tomb owners.

A- The daughter of *nzwt-nfr* (G 4970).

B- The mother and daughter of *sšm-nfr II* (G 5080).

C- The daughter and wife of *sšt-ḥtp ḥti* (G 5150).

D- The wife of *rdi-ns* (G 5032).

E- The wife of *i3-sn* (G 2196).

The bearers of this name in G 4970 and 5080 can be identified, though with considerable doubt².

4- *dw3-n-rḥ* (G 5110): He might be the same *dw3-rḥ* who is mentioned in the tomb of his mother *mr.s-ḥnh III* (G 7530-G 7540). The slight difference between the two names forms however an obstacle against this identification³.

5- *st-k3* the owner of a mastaba to the west of G 5460 might be the same *z3b šḥd sš st-k3* who is mentioned in G 4761. Though the latter individual was not referred to as the son of the owner of G 4761, *nfr I*, Junker⁴ believed that he is most probably his son.

6- *ph-n-ptḥ* (G 5280): his mother *imn-df3.s* was mentioned in the tomb of *sšm-nfr I* (G 4940) as the wife of the latter. He is most probably thus the namesake who was mentioned in G 4940 with no title or relation to the owner of the tomb.

7- *rḥ-wr I* (G 5270) and *Rḥ-wr II* (G 5470): There are three bearers of the name *rḥ-wr* mentioned in three tombs⁵:

A- Son of *sšm-nfr I* (G 4940)

B- Son of *sšm-nfr II* (G 5080)

² For discussion see infra p. 145.

³ For discussion see supra p. 117.

⁴ JUNKER, *Giza VI*, 29.

⁵ For a discussion of the identification of these three persons with the two tomb owners, see infra p. 147

C- A man mentioned in the mastaba of *sšm-nfr* III (G 5170)

8- *s3tw* was mentioned as the son of *sšm-nfr* II in G 5080. Junker believed that *s3tw* was buried in G 5480 which happens to be near the tomb of his brother *r^c-wr* II (G 5470). However the occurrence of the name of *s3tw* in G 5480 is very unlikely⁶. Another bearer of the same name was mentioned in G 4970 but he can not be identified with the son of *sšm-nfr* II because there are no other indications for the identification.

9- *sndm-ib mhi* (G 2378) was mentioned as the son of *sndm-ib inti* (G 2370) in the tomb of the latter.

10- *hmn-inti* (G 2374) was mentioned as the son of *sndm-ib inti* (G 2370) in the tomb of the latter.

11- *ftk-(ti)* the son of *sndm-ib inti* (G 2370) is probably *k3i-hr-pti ftk-ti* the owner of G 5560.

12- *pti-z3bw ibbi* was mentioned in G 2381 as the son of *mry-r^c-mry-pti-nh nhbw*. His name is inscribed on a coffin which was discovered in the intact burial chamber of G 2381 A.

13- *sš3t-htp hti* (G 5150) might be related to *sš3t-htp* II the owner of a nearby mastaba. Other than the similar name, there is no other piece of evidence to confirm this relationship. Another *hti*, a possible owner of G 5480, might be related to of *sš3t-htp hti* (G 5150) since one of the sons of the latter is also named *hti*.

14- *nh-m-r^c* (G 2156 c) is mentioned as a son in the tomb of his father *ir-n-r^c* (G 2156b). In the tomb of the latter the father is mentioned to be a *k3-n-nzwt*, most probably the *k3-n-nzwt* III, the owner of G 2156 a.

15- *k3-s-wd3* (G 5340) was identified by Reisner as the similarly named son represented in the mastaba of his father *k3-nfr* (G 2150). The owner of a nearby tomb is named *k3-nfr* III which implies that he is related to the owner of G 5340. *k3-nfr* III was careful not to violate the building of G 5350 which may indicate that the anonymous owner of latter mastaba belonged to the same family. A third *k3-nfr* is mentioned in G 2184 as the father of the owner *3ht-mr-nzwt*.

16- *issi-b3f* who is mentioned in G 2370 might be the son of *hnit* whose tomb is located between G 5470 and G 5370⁷, because of the similarity of the name and title in both cases.

17- *d3ty* (G5370) Another person with the same name is depicted as the son of *d3ty* in the mastaba of the latter (G 7810) in ECE. This man held the almost identical titles of *imy-r3 k3t nt nzwt* and *wr md^c šm^cw*.

⁶ See supra p. 64.

⁷ BROVARSKI, *Giza* VII, 85.

B) The second piece of evidence for a family relation is the mention of a tomb owner or one of his family members as a dependant in another tomb. This evidence is based on the speculation that deceased persons might have been served by the younger members of their extended families or by the same priests and dependents who served their large families. A genealogical relation of some type is thus to be conjectured between tomb owners when the same dependent is mentioned in their tombs. However, the complete agreement between the name and titles of a dependant in both tombs occurs only rarely. In most cases two or more dependants with similar names are attested but each is attributed different titles rendering the evidence for the identification weak. Nevertheless all such cases were mentioned below for the sake of completeness.

- 1- *mni* and *ḥtpi* are mentioned in G 5150 and G 5170, but with different titles in each case.
- 2- *wr-ti* who is mentioned in G 2378 could theoretically be the *z3b sš* by the same name who appears on the false door of his father, *snnw* (G 2032)⁸.
- 3- *ḥm-3ḥty* appears in G 2370 and G 2378, with similar but not identical titles.
- 4- *sndm* who is mentioned in G 2370 might be the same *sndm* owner of G 2364. Another person with the same name but with no titles mentioned in G 2374.
- 5- *ndm* is mentioned in G 2370 and G 5080 but with different titles in each case.
- 6- *ini* and *ntr-nfr* are mentioned in the tombs of *sšm-nfr* I (G 4940) and *sšm-nfr* III (G 5170). However the fact that the two tombs do not belong to the same time frame and the different titles of the two dependents in each tomb makes the identification unlikely. A third *ntr-nfr* was depicted as the son of *sšmw* on a fragmentary architrave which was used to cover shaft S 590⁹.
- 7- G 2337 has three occurrences of the name *d3ty*, one of whom is the son of the owner. Another *d3ty* is mentioned as a dependant in G 2364. No agreeing titles between the two occur.
- 8- *pth-špss* : Two persons with this name were mentioned in G 5150 and G 2370. There are however no titles in the second tomb which would allow a confirmation for the identification.
- 9- *K3r*: Two persons with the same name are mentioned in G 2370 and in G 5550 but with different titles in each case.

⁸ BROVARSKI, *Giza* VII, 86.

⁹ JUNKER, *Giza* VIII, 26 (8).

C- The third case of family relation evidence is based on suggestions presented by the excavators of the cemetery depending on such indications as tomb's location, building sequence and other considerations which are not always stated by the publications. These case are listed below.

1-G 2172 forms the nucleus of a complex of closely related mastabas G 2175, G 2177, G 2178 and G 2179. Reisner¹⁰ believed that the two mastabas G 2172 and G 2175 were nearly contemporaneous and found it possible that *ip* (owner of G 2172), *ndwm* (owner of 2175) and *hnmw-nfr* (a person depicted in G 2175) represent three generations of the same family.

3- Mastaba S 501-589 had, contrary to habit, its main cult place in the north. Junker¹¹ explained the unusual location by proposing that the owner of the mastaba was related to *hti* (G 5480) and wanted thus to put his cult place as close as possible to the mastaba of his ancestor.

4- Kanawati¹² remarked that the similarity of decoration in the tombs of *sš3t-htp hti* (G 5150) and *nzwt-nfr* (G 4970) may suggest that they related.

5-Junker¹³ believed that the owners of the three tombs S 2064-2130, S 2131-2134 and S 2138 a belong to one family. In the case of the first two tombs the justification presented by Junker for his suggestion was the fact that the owner of S 2131-2134 aligned his mastaba with the western line of S 2064-2130 although it would have been wiser to extend the building a little bit to the east instead of violating the southwest corner of G 4970.

6- The south walls of S 975 a and S 974-975 are aligned, which led Junker¹⁴ to conclude that both owners belong to the same family.

7- The unknown builder of S 984 had his shaft made opposite to that of *wnšt* (G 4840), so that their burial chambers will be next to each other, a situation which led Junker¹⁵ to believe that the two owners were related. A considerable part of the building of S 984 was devoted to the service of the north false door of *wnšt*. It is questionable whether S 948 belonged to *ii-mry*, the son of *wnšt*, to one of her grandchildren (probably *k3-špr*) or to a more remote relative of the third degree.

¹⁰ REISNER, *Additions*, 80.

¹¹ JUNKER, *Giza VIII*, 22, where he gave another example of a similar case: *Giza*, VI, 153.

¹² KANAWATI, *ACE reports* 18, 36.

¹³ JUNKER, *Giza II*, 10.

¹⁴ JUNKER, *Giza VII*, 13.

¹⁵ Junker gave other examples of this situation: *Giza VII*, 22, 24.

8-Junker¹⁶ proposed that the owner of S 639 is a relative of the owner of S 411-413, with no particular reason except that the former leans on the south wall of the latter.

9- With no apparent justification, Junker¹⁷ remarked that the group of tombs (S 320 a, S 319, S 319 b, S 320) in the street between G 5060 and G 5070 belongs to one family.

10-A simple extension was added to the mastaba of *hnt-k3w.s* by *tn3*. The similarity of the two buildings led Junker¹⁸ to conclude that *tn3* was most probably not a poor stranger who intruded on the older building but was rather a relative of *hnt-k3w.s*.

11-The front wall of S 359 retreats a little bit backwards from the west wall of the chapel of *nsw-ḳdw* II in order not to interrupt its service. Also it seems that a part of the north wall of S 359 was removed to give the impression of integration with the tomb of *nsw-ḳdw* II. For these reasons, Junker¹⁹ proposed a family relation between the two owners.

12- Tomb 450-490 leans on the south side of *hwfw-snb* II. Junker proposed that the tomb can belong to a member of the family of *hwfw snb* II, probably to his son²⁰.

13- The south cult room of the mastaba of *htpi* is facing the burial chamber of shaft S 789 in G 4950. It is thus possible that the building of G 4950 was latter used for the burial of *htpi*, the owner of the latter tomb as in other cases²¹. This condition might indicate a family relation between the two owners.

15- G 5350 is similar to G 5340 in many aspects so that it could be assumed that the latter served as a model for the former. Junker²² assumed consequently that the unknown owner of G 5350 is the son of *k3-s-wd3* owner of G 5340.

16- The narrow serdab of G 5460 is similar to those of G 5350 and G 5340 which might link this mastaba too to the family group of *k3-s-wd3*²³.

17- According to Reisner²⁴, the owner of G 2353, *h3gi*, can be the son of *hrw-nfr*, owner of G 2352

18- Reisner²⁵ believed that *b3-b3.f* (G 5230) was a son of *dw3-n-r^c* (G 5110), without giving a particular reason for his belief. Several indications concerning the architectural elements of

¹⁶ JUNKER, *Giza* VII, 44

¹⁷ JUNKER, *Giza* VII, 45.

¹⁸ JUNKER, *Giza* VII, 85.

¹⁹ JUNKER, *Giza* VII, 138.

²⁰ JUNKER, *Giza* VII, 141

²¹ For an example see Junker, VII, 9.

²² JUNKER, *Giza* VII, 184.

²³ JUNKER, *Giza* VIII, 48. To prove his point, Junker compares this case with the similarity between the serdabs of *sšm-nfr* I, *sšm-nfr* II, *r^c-wr* I and *r^c-wr* II.

²⁴ REISNER, *Additions*, 63.

²⁵ REISNER, *Giza* I, 69, note 1.

both tombs and the economical capacity of their owner seem to support however the belief of Reisner²⁶.

19-The similar name of *ḥfw-snb* I and *ḥfw-snb* II, their priesthood of Khufu and the adjacent location of their mastabas would suggest strongly a relation between both persons. However, Junker²⁷ remarked that the mastaba of the latter blocked the access to that of the former, and for this reasons he excluded a genealogical tie between the two.

Based on the above mentioned pieces of evidence for kinship ties in CEE, three extended families can be reconstructed in this cemetery: The *sšm-nfr* family, The *k3-n-nzwt* family and the *sndm-ib* family.

1- B The *sšm-nfr* family

Junker²⁸ listed ten members of the *sšm-nfr* family whose tombs are located at Giza, Dahshur and an unknown location. He stated the criteria on which he based his choice for those persons to form a family line: *Bei der Auswahl war unter anderem maßgebend, daß einer der seltenen Fälle eines Familiennamens vorliegt, oder besser gesagt, einer bestimmten Anzahl von Namen, die sich in der Familie ständig wiederholen; es sind šsm-nfr, r^c-wr, pḥ-n-ptḥ. Dazu sind fast alle Angehörige der Familie in dem gleichen Zweig der Verwaltung angestellt: Vorsteher der Schreiber des Königs- Archivs, der Urkunden des Königs, Schreiber des Buches oder ähnliches. Wo wir also einen der drei Namen treffen und der Träger des Namens als Beamter des Archivs auftritt, so steht die Vermutung dafür, daß er zu unserer Schreiber familie gehört.*

The members of this family who are buried in Giza are 11 in number, seven of whom are buried in CEE (map 4.1): *sšm-nfr* I (G 4940), *sšm-nfr* II (G 5080), *sšm-nfr* III (G 5170), *r^c-wr* I (G 5270), *r^c-wr* II (G 5470), *pḥ-n-ptḥ* (G 5280) and *s3tw* (G5480). The other four persons are buried in cemetery G I S, but were included in the present study for the sake of completeness: *sšm-nfr* IV (LG 53), *ḥtp-ḥr.s* (LG 54) and the owners of the adjacent tombs *pḥ-ḥtp* and *sšm-nfr-tti*. Junker attempted to place these 11 persons in one family tree and to trace the chronology of the family.

The first member of this family to be buried in CEE was *sšm-nfr* I. Though *sšm-nfr* I mentioned 15 family members and dependants in his tomb (G 4940), we know nothing about

²⁶ See infra, p. 213.

²⁷ JUNKER, *Giza* VII, 126.

²⁸ JUNKER, *Giza* III, 9-14.

his parents. One of the three sons mentioned in *sšm-nfr* I's tomb is the *r^c-wr* whom Junker²⁹ identified with *r^c-wr* I (G 5270) because the mastaba of the latter is located next to that of *ph-n-ptḥ* (G 5280), another son mentioned in the tomb of *sšm-nfr* I. The two children of *sšm-nfr* I, *r^c-wr* I and *ph-n-ptḥ*, were thus buried at some distance from the tomb of their father yet in the vicinity of each other. While PM³⁰ quoted the opinion of Junker concerning the genealogy of the second generation of this family, Reisner³¹ considered *r^c-wr* I rather a son of *sšm-nfr* II (G 5080).

Here exists a gap in our knowledge about the tree of this family since there is a difficulty in finding a relationship between *sšm-nfr* I (G 4940) and *sšm-nfr* II (G 5080) in spite of their similar names. The main obstacle against a father son relation between these two tomb owners is the fact that the wife of the first (as represented in G 4940) is *imn-df̄s* and the mother of the second (as represented in G 5080) is *mrt-it.s*. Junker³² suggested that *sšm-nfr* I might have had two wives as a possible solution for this point. Though it is difficult to find a direct relation between the two men, they almost certainly belonged to the same family, not only due to the shared name but also because of the similar titles. Since brothers bearing identical names are attested in many Old Kingdom tombs, it can be proposed that *sšm-nfr* I might be the uncle of *sšm-nfr* II or, less probably, his brother.

While the identity of the husband of *mrt-it.s*, mother of *sšm-nfr* II, is unknown, that of her parents might be guessed from another occurrence of her name in CEE. It is possible that she was the same *mrt-it.s* daughter of *nzwt-nfr* and *hnt* (G 4970). Another daughter of the same couple was called *hnwt-sn*, which happens to be the same name of the wife of *sšm-nfr* II. Whether a marriage between *sšm-nfr* II and his maternal aunt is to be suggested is questionable.

In the tomb of *sšm-nfr* II (G 5080) five sons were represented, of which three are likely to be the owners of the nearby tombs G 5170, G 5270 and G 5480. The fatherhood of *sšm-nfr* II for *sšm-nfr* III (G 5170) is further assured by the fact that *hnwt-sn* appears in the tomb of the first as wife, in the tomb of the second as mother. The relationship of *sšm-nfr* II to *r^c-wr* II owner of G 5270 on the other hand has less solid evidence. It is true that one of the sons of *sšm-nfr* II is called *r^c-wr* but whether the person in question should be *r^c-wr* I or *r^c-wr* II is questionable. Junker has argued that *r^c-wr* II owner of G 5270 might be the similarly named son of *sšm-nfr* II because the mastaba of *sḏt_w*, the third son of *sšm-nfr* II, is located near to G 5270. By the

²⁹ JUNKER, *Giza* III, 14.

³⁰ PM III, 158.

³¹ REISNER, *Additions*, 48.

³² JUNKER, *Giza* II, 25.

mastaba of *s3tw* Junker referred to G 5480, in which the occurrence of the name of *s3tw* is doubted³³.

sšm-nfr II (G 5080) had a daughter who was named after his mother *mrt-it.s*. Though it is tempting to see her as the bearer of the same name who is represented in the tomb of *sš3t-ḥtp ḥti* (G 5150) as the wife of the latter, this identification is weak, not only because of the common female name, but also because *sš3t-ḥtp-ḥti* should be dated to an earlier period than *sšm-nfr* II³⁴.

sšm-nfr III (G 5170) had two sons: *sšm-nfr-ptḥ* and *sšm-nfr*. The latter can be identified with *sšm-nfr* IV (LG 53) whose tomb lies next to that of *ḥtp-ḥr.s* (LG 54). The last named was identified by Junker with *ḥtp-ḥr.s*, wife of *sšm-nfr* III. In addition to that, one of the sons of *sšm-nfr* IV is called *sšm-nfr-ptḥ* like the second son of *sšm-nfr* III represented in the latter's tomb. The owner of the eastern wing of LG 53 is called *sšm-nfr-tti*. In spite of the absence of the inscriptional evidence in the tombs of father and son, Junker believed that *sšm-nfr-tti* was a son of *sšm-nfr* IV³⁵. From these pieces of evidence and other architectural features, Junker concluded that the two tombs LG 53 and LG 54 belong to the members of *sšm-nfr* family. The discrepancies in titles are however hard to explain. *sšm-nfr* IV does not have any scribal titles in his tomb, but carries rather many variations of *ḥry-sš3 nzw*. This indicates perhaps that he was raised in the hierarchy more than the earlier members of his family, unless the new titles were not a result of the inflation of title giving which happened at the end of OK. Baer³⁶ was altogether against the genealogical relationship between the members of *sšm-nfr* family buried in CEE and those buried in GIS.

Another tomb owner with the name *sšm-nfr* occurs at Dahshur. Since he too bears scribal titles, he should not be excluded from being a member of the *sšm-nfr* family in Giza. Junker attempted to date his mastaba stylistically depending on the decoration and architectural elements, concluding that he might be placed in the fifth generation of *sšm-nfr* family, though the accurate date is difficult to pinpoint.

Yet another person named *sšm-nfr*³⁷ has a mastaba in the Teti pyramid cemetery. His biography relates his career under kings Isesi, Unas and Teti: "I was a judge and scribe in the time of Isesi. I was judge and superintendent in the time of Unas. It was Teti my lord who promoted me as a king's chamberlain". *sšm-nfr* of Saqqara changed his titulary completely on

³³ See document of tomb supra p. 64.

³⁴ The range of dating for G 5150 is end of Fourth Dynasty- early Fifth Dynasty, see supra p.104.

³⁵ JUNKER, *Giza* XI, 132.

³⁶ BAER, *Rank and title*, 133 (479).

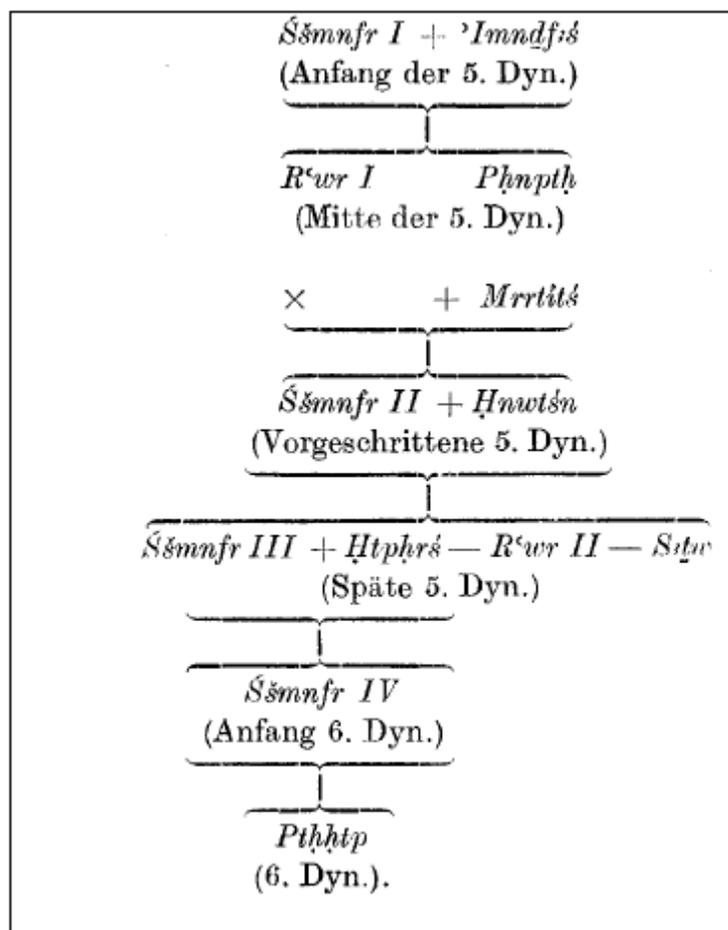
³⁷ The tomb is unpublished but the biography and few remarks are given in : KANAWATI and HASSAN, *The Teti cemetery* I, 55-67.

the pillars and architrave of the portico of his tomb, and included the title *t3yty z3b t3ty*. Since the size of his small tomb does not fit the sizes of the tombs of Teti's viziers, Kanawati concluded that *sšm-nfr* was promoted to the vizierate in the reign of Userkare, and supported his proposal by the destruction of *sšm-nfr*'s tomb. The similar name, the function of a scribe, the office of a vizier and the valid dating frame would perhaps elect this person as a member of the extended *sšm-nfr* family.

Though the question of dating is dealt with in more details elsewhere in this study, it is useful in the current context to outline the time frame of the *sšm-nfr* family. The starting point for the dating of Junker³⁸ of this family is the mastaba of *d3ty* G 5370 in which a wooden chest bearing a sealing of lector priests of Sahure and Neferirkare was found. Junker believed that the mastaba of *r^c-wr* I (G 5270) must be latter than that of *d3ty* because it uses its rear wall. *sšm-nfr* III used the rear wall of *r^c-wr* I for the additions which he made to the original core of G 5170. If we bear in mind that *r^c-wr* I was the son of *sšm-nfr* I, this means that *sšm-nfr* III should date to an advanced period the fifth dynasty.

For *r^c-wr* II (G 5470) a starting point is also available. In his mastaba seals with the name of Isesi were found. In the same row where G 5470 is located there are mastabas with estates carrying the name of Isesi and Unas and some tombs date certainly to the Sixth dynasty. As for *sšm-nfr* IV, the estate names in his tomb are composed with the name of Isesi. The finishing of the mastaba should at least, however, be dated to the Sixth dynasty because the east wall of the burial chamber possesses a large offering list which is characteristic for this dynasty. *Pth-htp*, the son of *sšm-nfr* IV (LG 53), has among others a title in the pyramid of Teti, the royal name acting as a terminus ante quen non thus.

³⁸ JUNKER, *Giza* III, 13-14.



sšm-nfr family tree after Junker, Giza III, figure on p. 14

1- C The *k3-n-nzwt* family

This family consisted of five members who were owners of mastabas in the WCE (map 4.2). Only two of these mastabas are located in CEE: G 2156 b and G 2156 c. The three other tombs are located in cemetery G 2100 (G 2155, G 2156, G 2156 a). For reasons of completeness, the other 3 tombs were included in this study as well.

Mastaba G 2155 forms the nucleus of this family group. It belongs to *k3-n-nzwt* I who is the first known member in this family. A holder of the titles *z3 nzwt*, *z3 nzwt n ḥt.f*, *k3-n-nzwt* I belongs to a group of titular princes estimated by Schmitz³⁹ to be born in the Fourth Dynasty and to have carried out their careers between the end of the Fourth Dynasty until well into the Fifth Dynasty. His high titles, his tomb size, its decoration and the large number of servants represented in it show that *k3-n-nzwt* I had a high rank and a large fortune. *k3-n-nzwt* I does not mention his parents in his tomb but depicts three of his children: *ḥr-wr*, *wd3t-ḥtp* and *k3-n-nzwt-šri*. Only the tomb of the last named son could be located. He is most probably *k3-n-nzwt* II whose mastaba (G 2156) leans on the east wall of that of the father. The tomb of *k3-n-nzwt* II is very modest when compared to his father's. He does not carry either any of the high titles

³⁹ SCHMITZ, *Königsohn*, 25-26

of *k3-n-nzwt I* , maybe those were inherited by his elder brother *hr-wr*. No funerary priests were represented either in the mastaba of *k3-n-nzwt I*. In G 2156 a namesake son, *k3-n-nzwt III*, is mentioned to have completed the tomb of the father *k3-n-nzwt II*. The burial place of *k3-n-nzwt III* is not known with certainty but it might be the tomb which is built against the north wall of his grandfather, G 2156 a⁴⁰.

The son of *k3-n-nzwt III*, *ir-n-rʿ*, also had a small tomb G 2156 b opposite to that of his grandfather *k3-n-nzwt II*. A text in his tomb mentioned that he was assigned the supervision of the funerary service of his father *k3-n-nzwt III*. Another text states that his tomb was built (completed?) by his son *ʿnh-m-rʿ*. The latter built his mastaba G 2156 c close to his father's and modeled the space between both tombs as a passage.



Family tree of *k3-n-nzwt* after Junker, Giza III, figure on p. 15.

1- D The *sndm-ib* family

Although the *sndm-ib* complex offers abundant data for reconstructing the genealogical ties between its tomb owners, there remain gaps in the history of the four generations of this family whose members lived between the reigns of Kings Isesi and Pepi II. The first tombs

⁴⁰ Junker had assumed that G 2156 a belongs to the elder children of *k3-n-nzwt I*, *hr-wr* and *wd3t-htp*, but he changed his mind later because G 2156 a is less wealthy than G 2156 the mastaba of *k3-n-nzwt II*, their younger brother. JUNKER, *Giza III*, 146.

built by the *snđm-ib* family in the northeastern corner of CEE seem to have replaced earlier constructions. Reisner⁴¹ suggested that those constructions might have belonged to the same family as well, but he could not assert this possibility. He was also of the opinion that *inti*'s ancestors were probably connected with the official class which enjoyed the income of the old endowments of the Fourth Dynasty and that, like all their class, they must have been buried in the Giza cemetery⁴². Broveraski⁴³ on the other hand suggested two candidates for the father of *snđm-ib inti*, both a *snđm-ib* buried in Saqqara. Since the name *snđm-ib* was however a quite common one during the OK, no confirmation can be acquired concerning the background of this family, the first members known for us with certainty being the founder of the complex *snđm-ib inti* and his wife *tji* (G 2370).

Three of the four sons mentioned in *snđm-ib inti*'s tomb can be identified with owners of other tombs: *snđm-ib mhi* (G 2387), *hnm-inti* (G 2374) and *ftk-(ti)* (probably G 5560). Of all of *inti*'s sons, it is *snđm-ib mhi* (G 2378) who occupied the most prominent place in his father's mastaba. *mhi* was married to *s3t nzwt n ht.f hnti-k3w.s* with whom he shared his mastaba. It has been suggested that she might be the *hnti-k3w.s* with the same title whose tomb lies to the west of Unis's pyramid at Saqqara⁴⁴. Another *hnt-k3w.s* is attested in CEE as the owner of G 5140, but with no evidence of any possible identification with the wife of *mhi*. On the west wall of the anteroom (Room II) of G 2378, *snđm-ib mhi* and *hnt-k3w.s* appear in a family group together with two sons and a daughter⁴⁵. The two sons were named after the father; the "eldest son," who is shown as an adult, was called *snđm-ib*. The younger son, who is depicted as a child, was called *mhi*. The daughter of the couple was likewise named *hnt-k3w.s* after her mother.

Brovarski proposed that the elder son *snđm-ib* may have been the owner of the nearby mastaba G 2384 for two reasons. First, G 2384 appears to have been the next major construction in the *snđm-ib* complex built after G 2374 and it would consequentially be appropriate to consider it the burial place of a member of the third generation of the family. The second piece of evidence consists of a loose stone with a fragmentary autobiographical inscription that may derive from the facade of G 2384, since it appears by its character to fit nowhere else in the complex. The text is fragmentary but the context is evidently related to the building of the owners's tomb. The name of that individual can be reconstructed as *snđm-*

⁴¹ Reisner, *snđm-ib*, 126.

⁴² Reisner, *BMFA* 11, 65.

⁴³ BROVARSKI, *Giza* VII, 24.

⁴⁴ SAAD, *Saqqara and Helwan*, 62–66.

⁴⁵ BROVARSKI, *Giza* VII, pl. 115; figs. 114, 115.

ib. The last line of the inscription refers to the brother of the owner, who is entitled “royal chamberlain, royal master builder in [both houses]” Unfortunately, his name is lost. Nevertheless, he could have been *sndm-ib*’s younger brother, *mḥi*, who appears without titles in his father’s tomb at an earlier stage of his life.

The second son of *sndm-ib inti* was called *ḥnm-inti*. He must be identified with the owner of G 2374 since that name is a relatively rare one, being attested only in few examples⁴⁶. Two other persons named *ḥnm-inti* occur in G 2391. Since the last mentioned tomb belongs to the funerary priests of the *sndm-ib* family, those two persons were obviously named after their patron. The name of the wife of *ḥnm-inti* is unattested in his tomb. Nevertheless, it seems that at least one child was represented in G 2374, since part of a figure of a young child holding a bird is preserved in front of *ḥnm-inti* in a scene in his chapel⁴⁷. The name of that child is damaged but can be reconstructed to *ni-(ḥḥ-hrty)*.

Noticing the rarity of the personal name *ftk* in the Old Kingdom, Brovarski⁴⁸ reconstructed the name of the third son of *sndm-ib inti* to *ftk-ti*. If this was indeed the case, that son may have been the owner of G 5560, located not far from his father’s in the northeast corner of CEEN. The mastaba is dated by Strudwick⁴⁹ to the first half of the Sixth dynasty and by Harpur to the period between Teti and Merenre. This span of time would not be excessive for a son of *inti* who had been shown as a man of mature years in his father’s mastaba, particularly if he passed away in the earlier part of the period in question. The difficulty is that *ftk-ti* is only the good name of the owner represented in G 5560, while his main name is *k3-ḥr-ptḥ*. Moreover *k3-ḥr-ptḥ ftk-ti*, owner of G 5560, and *ftk-ti*, represented in G 3270, do not have similar titles. In addition to that *k3-ḥr-ptḥ ftk-ti* possesses none of the titles related to public works that were held by *sndm-ib inti*, *sndm-ib mḥi* and *ḥnm-inti*. Nevertheless, and since G 5560 was badly denuded, it is possible that the missing titles appeared elsewhere on its walls. A number of features of *k3-ḥr-ptḥ ftk-ti*’s mastaba are suggestive of some connection between him and the *sndm-ib* family. Moreover, *k3-ḥr-ptḥ ftk-ti*, like *sndm-ib inti*, *sndm-ib mḥi*, *ḥnm-inti* and their descendants, was buried in a sloping passage shaft. Because nothing is known about the parentage of the *k3-ḥr-ptḥ ftk-ti* from the surviving reliefs in G 5560, he could have still been identical with *inti*’s like-named son.

From here the line of the family seems broken since there is a gap between the generation of *sndm-ib inti*’s sons and the following generation. The next member known to us from this

⁴⁶ PN 1, p. 276, 19; 2, p. 383. See Junker, Gîza VI, fig. 38b, for an official named *ḥnm-nty*

⁴⁷ BROVARSKI, *Giza VII*, fig. 86.

⁴⁸ BROVARSKI, *Giza VII*, 25.

⁴⁹ STRUDWICK, *Administration*, 154(150).

family is *mry-r^c-mry-ptḥ-ḥnh nbw* (G 2381) whose parents are not named on any of the surviving blocks from his chapel. Though the precise relationship to the *sndm-ib* family is unknown, the location of *nbw*'s tomb in what is definitely a family complex, as well as the fact that his titles are connected with public works, make some relationship very likely. Speculations elect either *sndm-ib inti*⁵⁰ or *mḥi*⁵¹ for the father of *nbw*. Brovarski⁵² reconstructed the family tree of *sndm-ib inti* and placed *nbw* in the third generation, suggesting with some doubt that he was *sndm-ib inti*'s grandson, probably as a son of *hnm-inti*⁵³. It is true that the only recoverable name of a son of *hnm-inti* does not apply to the great or good names of *nbw* but considering the extensive damage to *hnm-inti*'s reliefs, it is possible that *nbw* was originally represented elsewhere on the walls of G 2374. In his biography, *nbw* mentioned that he served as apprentice to an older brother, whose name was never given or most unfortunately lost. A brother named *Pth-mr-ḥnh-ppy* was represented on a block in G 2381, but in a position subordinate to *nbw*, making it unlikely that he is the older brother referred to in the inscription. Brovarski suggested that the unnamed brother in the biographical inscriptions might be the owner of the badly denuded mastaba G 2385, from which only the lowest undecorated course survived. Two sons were represented with *nbw* in his mastaba: *tm3t* and *ptḥ-z3bw ibbi*. Wadi Hammamat inscriptions⁵⁴ which commemorate an expedition led there by *nbw* mention another grown up son who accompanied his father during the expedition: *mr-ptḥ-ḥnh-mry-r^c*. The latter appears nowhere in the surviving reliefs from the mastaba of *nbw*. This alone does not form any obstacle to identifying him as another son of *nbw*. Since perhaps fifty percent of those reliefs are lost, the figure of *mr-ptḥ-ḥnh-mry-r^c* may well have appeared in one or more of the missing scenes. Moreover, *ptḥ-z3bw* is described in the tomb of his father *hnw* as “z3.f mrt.f” not “z3.f smsw.” It is therefore possible that *mr-ptḥ-ḥnh-mry-r^c* was represented elsewhere in the chapel as the eldest son. *mr-ptḥ-ḥnh-mry-r^c* mentioned in Wadi Hammamat is almost certainly the same *mr-ptḥ-ḥnh-mry-r^c ptḥ-špss impy*, the owner of the sloping passage shaft G 2381 A, whose burial chamber was found intact. A coffin found in G 2381 A was inscribed for two persons: *mr-ptḥ-ḥnh-mry-r^c ptḥ-špss impy* and *ptḥ-z3bw ibbi*, who is almost certainly his brother based on the mention of his name as a son of *nbw* in G 2381. Though Reisner initially believed that the sloping passage shaft G 2381 A belonged to *mr-ptḥ-ḥnh-mry-r^c ptḥ-špss impy*, the presence of the two names has caused some confusion concerning the identity of the original tomb

⁵⁰ SMITH, *CAH* I, pt.2, 86.

⁵¹ REISNER, *ASAE* 13 (1914), 249; REISNER, *BMFA* 11, 62.

⁵² BROVARSKI, ‘Sendjemib Complex at Giza’, fig.2.

⁵³ BROVARSKI, *Giza* VII, pl. 11.

⁵⁴ SPALINGER, *SAK* 21, 303.

owner⁵⁵. Drawing attention to the similarity in plan between G 2381 A and sloping passage tomb G 2381 C Reisner concluded that *pth-z3bw ibbi* was buried in G 2381 C. Two chapels were built to the south of G 2384. The identical nature of those two chapels, G 2386 C1 and G 2386 C2 and the unusual intercommunication suggest that these were the chapels of the two brothers *mr-ptḥ-ḥmry-rꜥ pth-špss impy* and *pth-z3bw ibbi*.

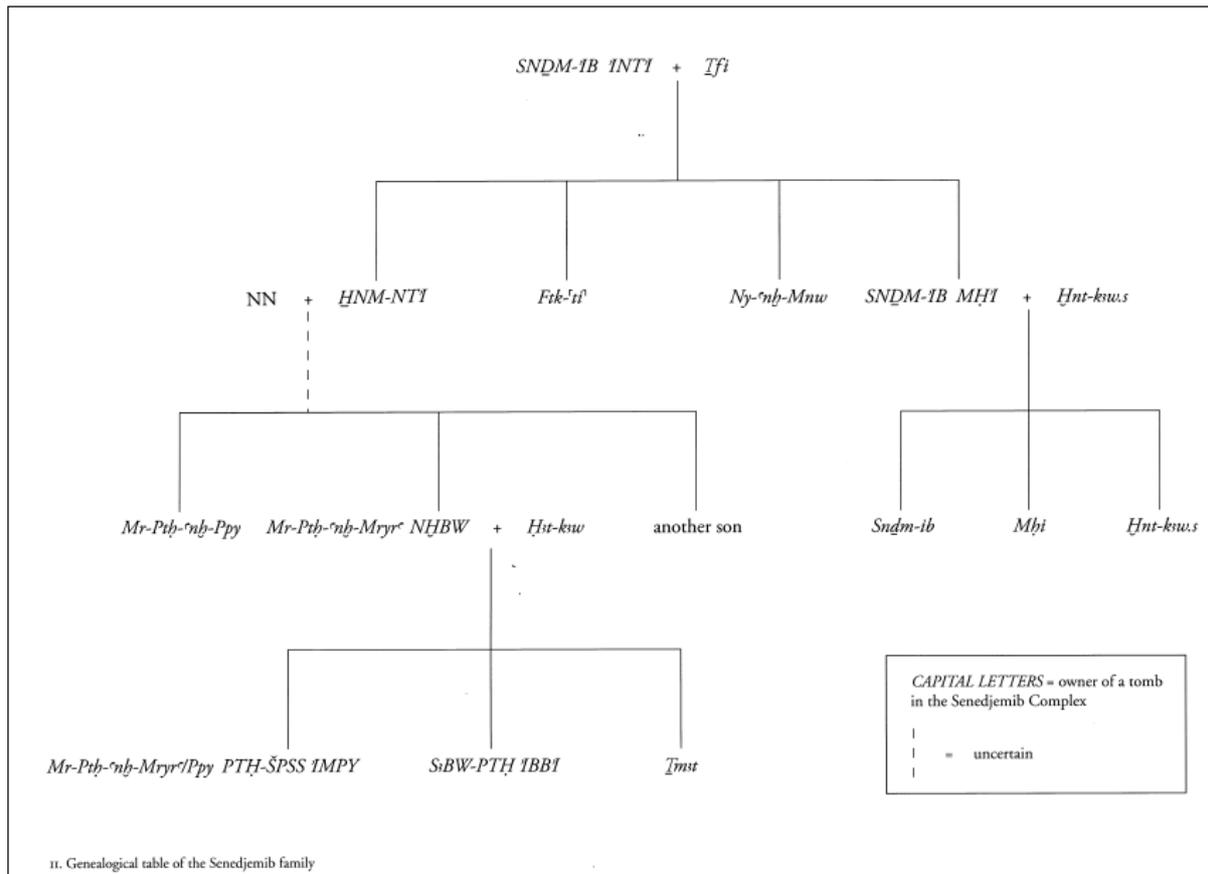
The chapel of *wr-k3w-b3 ikw* (G 2383), was built against the southern face of the tomb of *snḏm-ib mḥi* (G 2378). The location might suggest some connection between *wr-k3w-b3* and the *snḏm-ib* family even though we are ignorant of the exact relationship⁵⁶. Although his false door is damaged, the title *t3yty z3b t3ty* is discernable at the top of its outer jambs, but there are no titles of building or labor organization. His wife *tfrrt* and a son named *ikw* after his father are also commemorated on the false door.

It is not possible to determine the connection by blood between the *snḏm-ib* family and the family of funerary priests recorded in G 2391. They were most probably in charge of the funerary endowments of the *snḏm-ib* family and may have been their descendents. Their use of the old names, *snḏm-ib* and *ḥnm-inti* and the position of the mastaba bears out this conclusion but does not establish a blood relationship.

The tombs and burial places of the seven leading members of the family cover the period from the beginning of the reign of Isesi to about year 30 of Pepy II, a period of over 110 years perhaps as much as 143. The letters of Isesi in G 2370 indicated that *snḏm-ib inti* had already attained an important position by that time. The last burial of a chief member of this was that of *impy* and it took place in the reign of Pepy II.

⁵⁵ Brovarski ('Sendjemib complex', 115–16) misled by the alabaster headrest beneath the head of the body, which was inscribed for *pth-z3bw ibebi*, mistakenly assigned the burial to that individual, instead of *pth-špss impy*, but corrected his opinion later in Giza VII, 33.

⁵⁶ STRUDWICK, *Administration*, 81 (40).



Genealogical chart of *sndm-ib* family after BROVARSKI, *Giza* VII, pl. 11.

2- Service relationships in CEE

2- A Cult maintenance during the Old Kingdom

It is worthwhile in this context to define the expected conditions, practices and time frame for service of tombs in the years following interment during the Old Kingdom. In order to ensure a daily sustenance provided by the means of offering ritual at the tomb, an Egyptian would assign individuals to carry out his cult continually. Such cult was centered on the presentation of food offerings and other essentials to statues of the deceased, to his two dimensional representations in the tomb chapel, or to the deceased himself. Other funerary services included the pouring of water, the burning of incense and the reciting of the invocation-offering formula⁵⁷. Texts setting up mortuary endowments show that the living had a continuing obligation in maintaining the cults of their forebears⁵⁸. Ideally, a designated

⁵⁷ WILSON, *JNES* 3, 215.

⁵⁸ SEIDL, *Rechtsgeschichte*, 1962, p. ?

person, usually the eldest son, was committed to administrate the cult of his employer as stated in an prearranged agreement. In practical terms the carrying out of non-royal cults during the Old Kingdom did not probably continue for a long period after the death of their founders⁵⁹. Archeological evidence, derived from pottery types and from the violation of the offering places by latter constructions in many private tombs, indicate that such funerary cults would have lasted less than 100 years at the most.⁶⁰

Cult maintenance was in some cases a labour-intensive function whose organization required as many as 50 persons assigned to the mortuary cult of one tomb owner. Those cult personnel were either members of the family of the deceased, dependants employed in his service or a mixture of both. It appears that the recruited cult personal served the tomb owner after his death as they had done during his life since it has been suggested that servants of the living master became the servants of his *k3* after his death⁶¹. Several sources provide names and occupations of those cult personnel: their representation in the tombs of the master, in the monuments associated with his tomb or the titles containing the name of the master.

Baud⁶² introduced a division to categorize the functions of funerary cult personnel to two major types: those which are connected with the management of the house (*pr*) and those which are concerned with the accomplishment of the cult. This division differentiates between the tasks of stewardship which are connected with a establishment, a home or a tomb, and those which are concerned with the personal service for a deceased person. To the first type belong the bearers of the titles: *imy-r3 pr* and *imy-r3 s3r* and to the second belong the *hm-k3* priests⁶³. Inscriptional evidence indicates that the last mentioned priests, the *hmw-k3*, were organized in a well defined hierarchy during the Old Kingdom including: the overseer of mortuary priests (*imy-r3 hmw-k3*), the inspector of mortuary priests (*shd hmw-k3*), the supervisor of mortuary priests (*imy-ht hmw-k3*) and the simple mortuary priests (*hm-k3*)⁶⁴.

2-B Identification of cult personnel in CEE

The above mentioned titles characteristic to the persons employed in the service of other tombs are closely associated with each other in CEE since they co-occurred often with the same bearers. 11 persons in CEE carry the titles *imy-r3 s3r* (map 4.4), four of whom are tomb owners (G 2361, G 2366, G 5554, G 2338 X). Three of the last mentioned carry a title in the

⁵⁹ KAPLONY, *Asiatische Studien* 18/19, 297; ALLAM, *Das Altertum* 20, 143–144.

⁶⁰ SHERAI, *OKAA* 2006, 330 ff.

⁶¹ ALLAM, *RdE* 36, 1-15; BOLSHAKOV, *AfO* 18, 204–218.

⁶² BAUD, *Famille royale*, 218.

⁶³ REISNER, *BMFA* 32, 2-14.

⁶⁴ Personal communication with Yayoi Shirai.

ḥm-k3 hierarchy as well. The tombs of these four persons are concentrated around the *sndm-ib* complex since they were all in the service of the family as shall be explained below.

17 persons in CEE carry the title *imy-r3 pr*, 7 of whom are tomb owners (S 576, G 5550, G 5210, G 2396 G 5554, G 2366, S 660-661) (map 4.5). Five of the last mentioned are also employed as *ḥm-k3*.

79 persons in CEE carry titles that belong to the *ḥm-k3* hierarchy. Of those 14 are tomb owners (map 4.6)⁶⁵. The 66 family members and dependants who carry titles of the *ḥm-k3* hierarchy are represented in reliefs of 16 tombs (map 4.7) .

With the exception of G 5210 which is of a medium size, the tombs of cult personnel are rather small ranging in area between 2 and 33 m². None of these small tombs is placed in the regular or semi regular lines of the cemetery.

Remarkably, all the attested cases of tombs whose cult is served by identifiable owners of smaller neighboring tombs belong to members of one of the recognizable extended families who were buried in CEE, in most cases, or in ECE, in one case. Those cases will be discussed in the following, arranged under the family lines of the served families.

2-C The *sšm-nfr* family

In the eleven tombs belonging to the members of the *sšm-nfr* family members 63 estates were mentioned and, among other dependants, 27 *ḥm-k3* priests, 3 *imy-r3 pr* and 1 *imy-r3 sšr* were represented. This large number of funerary estates and cult personnel indicates the abundant resources which were dedicated to the cult maintenance of this family. Those persons involved in the cult service would be as a rule the owners of the small tombs in the vicinity of their employers. However, only one tomb owner could be related to the service of a member of the *sšm-nfr* family by textual evidence.

A text in the chapel of *pn-mrw* (G 2197) includes his testament⁶⁶. The inscription appoints a person called *nfr-ḥtp* and his offspring to the funerary service of *pn-mrw* preventing anyone else from having authority over his cult. In their capacity as *ḥmw-k3*, the main function of *nfr-ḥtp* and his successors was to present the invocation offerings to *pn-mrw*. A line of the text explains the source of such provisions: Bringing the *wdb-rd* from the *iti*, the vizier and judge

⁶⁵ The anonymous owner of G 2418 was excluded because his *ḥm-k3* title is associated with the pyramid of Khufu, not with the service of another tomb.

⁶⁶ REISNER and FISHER, *ASAE* 13, 24, pl. XI[a]; fig. 3; GOEDICKE, *Die Privaten Rechtsinschriften*, 68-74, pl. VI; ; CLERE, *JEA* 25, 215; MRSICH, *Hausurkunde*, 40-41; GÖDECKEN, *Eine Betrachtung der Inschriften*, 175-181, 189-194, 302, 331, 348.

*sšm-nfr*⁶⁷. The *wdb-rb* is a type of funerary supply whose exact nature is unknown⁶⁸, though it has been suggested that it means the turning or redirection of offerings from one official to another⁶⁹. If the funerary cult of *pr-mrw* is supplied from the cult of *sšm-nfr*, it is possible to imagine that former was a subordinate for the latter during his life as well. While Junker⁷⁰ took *iti* (patron) as a reference for the king, Grdseloff⁷¹ attributed the word to the name mentioned after it, that of *sšm-nfr*. There seems to be general agreement that the last name refers to *sšm-nfr* III⁷² owner of G 5170. No estate name is mentioned within the testament of *pr-mrw* so that a comparison with the estates mentioned in G 5170 is not possible, but the fact that *sšm-nfr* III is the only one of the three bearers of the name who carry the vizier title makes the identification almost certain.

2- D The *k3-n-nzwt* family

Of the 54 dependents who are represented in the tomb of *k3-n-nzwt* I (G 2155),¹² are *hm-k3* and two are *imy-r3 pr*. The mentioned 30 funerary estates within the same mastaba emphasize further the large scale of the funerary cult of the first known member of this family. None of those dependants is however mentioned elsewhere, preventing their identification with the owners of adjacent tombs.

The funerary cult of the *k3-n-nzwt* family seems to have relied latter on the younger family members, supervising perhaps other persons employed in the services of their ancestors. It is known from the inscriptions of the mastaba of *iri-n-r* (G 2156) that the latter was an *imy-r3 hm-k3* for his father *k3-n-nzwt* III (G 2156 b). Because the last title means a supervisor of funerary priests, Junker⁷³ believed that several persons must have been employed in the funerary service of *k3-n-nzwt* III. No non-family dependants are however represented in the tombs of the second or third generations of the family.

2-E The *sndm-ib* family

It is an often quoted statement that the small tombs in the vicinity of the *sndm-ib* family complex belong to persons who were employed in the funerary service of the family and dependent on their funeral states. However, only a limited number of the surrounding tombs

⁶⁷ SIMPSON, *Giza* IV, 24.

⁶⁸ GOEDICKE, *Die privaten Rechtsinschriften*, 70.

⁶⁹ WEEKS, *CdE* LVIII, 10.

⁷⁰ JUNKER, *Giza* III, 6.

⁷¹ GRDSELOFF, *ASAE* 42, 39-43

⁷² PM III, 82; JUNKER, *Giza* III, 6; HELCK, *MDAIK* 14, 71.

⁷³ JUNKER, *Giza* III, 146.

show textual evidence which indicates their direct association with the cult of this family (map 4.3). Evidently those owners of small tombs had no kinship ties with the *sndm-ib* family implying that the family's cults were operated by non-family dependents exclusively. The most distinguishing feature in the tombs of those dependents is the common textual representations on architraves in which titles and name of a member of the *sndm-ib* family occur on the top, followed by the titles and name of the tomb owner whose representation appear beneath accompanied occasionally by his family members.

G 2391 : This is a small mastaba of a family of priests located to the northeast of *sndm-ib* complex. Inscriptions on an architrave found in G 2391 (pl. 4.1) demonstrate the genealogy and careers of this priestly family in three generations. Here the deceased *ir-n-3ht* iri and his wife *k3.s-it.s* stand on the left as their three sons and one daughter present them offerings. The chief title of *ir-n-3ht* iri specifies the member of the *sndm-ib* family in whose service he was employed: Overseer of commissions for the mortuary priests of *sndm-ib mhi*. The tomb owner and his wife had two mutual sons in addition to other children of the couple, probably of previous marriages. Characteristic names of the patrons of the family are adopted for the offspring of the serving family: *sndm-ib*, *inti*, *hnm-inti* and *mhi*.

As demonstrated in graph 4.1, three of the sons of *ir-n-3ht* iri inherited the priestly titles of their father in his capacity as a *hm-k3*. The grandsons of the family founder did not however possess any titles, possibly because they were at a young age at the point of their representation in the family tomb. Nevertheless, the strong association with the *sndm-ib* family continued in this third generation as demonstrated by the two namesakes: *mhi* and *inti*.

G 5554: On the east face of this small mastaba were two monolithic stelae, the north of which shows representations of the tomb owner *hy* surmounted by a horizontal line of inscription (pl.4.2). The text included the high titles of a person named *sndm-ib* in whose service was *hy* employed. The inscription does not however specify whether the person in question was *sndm-ib inti* or *mhi*. *hy* carried also the title *hk3 hwt*. According to Piacentini⁷⁴ the *hwt* are large tracts of land including residential and agricultural areas, owned by high officials. The management of the *hwt* can be carried out by owners or by officials of lower rank who assist them. In this case, it is quite possible that *hy* managed the state of the *sndm-ib* family.

⁷⁴ PIACENTINI, *hk3w-hwt*, 236.

G 5562= G 2347 X: Three fragments of an architrave were found in shaft G 5562 A (pl.4.3). Represented on that piece were apparently once a large figure standing with staff in hand and a smaller figure in front of it with both hands uplifted. Inscriptions state high titles of the unnamed large figure, including offices as vizier and head of the construction department, typical occupations of the *sndm-ib* family members. The small figure is identified as *s-n-3ht* whose good name was *s-n-ht*, an overseer of the *hm-k3* priests department.

This representation suggests thus that the owner of G 5562 was most probably in the service of the *sndm-ib* family. The attribution of the architrave with G 5562 is however weak, not only because it was thrown neglected in the shaft but also because Reisner⁷⁵ remarked that the stone was covered with plaster, as if it had been reused.

G 2337 X: The relationship between *d3ty* and the *sndm-ib* family is made clear by a text on an architrave⁷⁶ which originates from his modest mastaba G 2337 X. In front of a standing figure of *d3ty* are four horizontal lines of text which provide, in addition to the standard offering formula, the titles and name of the vizier *sndm-ib* separated from those of *d3ty* by the element *n dt.f*, understood as the one who belong to his funerary estate a (the vizier's)⁷⁷. This might indicate that *d3ty* was a joint beneficiary of the royal and divine grants with his superior, *sndm-ib*. Baer⁷⁸ mentioned several similar examples and concluded that this type of relationship does not imply that the lives of the persons concerned have necessary coincided.

G 2364: The tomb belongs to a *hm-k3* whose name is *sndm-ib iny*. The name, title and location of the tomb lead to the reasonable conclusion that the owner was involved in the service of the *sndm-ib* family, though they does not allow a precise determination for the served member of that family. Brovarski⁷⁹ mentioned *sndm-ib iny* within the list of the funerary priests of *sndm-ib inti*, most probably only because he interpreted the good name of the owner of G 2364 as *inti*. However, the name is stated clearly as *ini* in the records of Reisner⁸⁰. Another *hm-k3* called *sndm-ib* was mentioned in G 2391, a tomb of a family of priests involved in the service of *sndm-ib* family for several generations. Though *sndm-ib* of G 2364 does not carry the *imy-ht pr-3* title attributed to *sndm-ib* of G 2391, the similar

⁷⁵ REISNER, *Additions*, 56 ad.

⁷⁶ SIMPSON, *Giza IV*, fig.41.

⁷⁷ SIMPSON, *Giza IV*, 29.

⁷⁸ BAER, *Rank and title*, 156 (590).

⁷⁹ BROVARSKI, "The Senedjemib Complex", 121.

⁸⁰ REISNER, *Additions*, 69.

context of funerary service and the close location of the two tombs may suggest that both men were the same person.

G 2362: A fragment which originated from this tomb (pl. 4.4) contained the same composition of scene and text typical for the associates of the *sndm-ib* family. The owner *rwd* was represented several times standing under a horizontal line of inscription containing the name of a person called *mḥi* and titled the overseer of all works of the king.

S 660-66: The owner, *šm-nḥw-ptḥ*, was obviously in the service of *sndm-ib* family since he carried the title "scribe of a phyle of the endowment of *sndm-ib*" (pl. 4.5). Again deciding whether the person served was *sndm-ib* the father or the son is not possible.

G 2396: A limestone fragment found in shaft G 2396 A (pl.4.6) mentions an unnamed *ḥm-k3* and *imy-r3 pr*. Other higher titles on the same fragment, that may refer to the person at whose service the anonymous owner of the tomb was active, include the most characteristic offices of the *sndm-ib* family members: the *imy-r3 k3t nbt nzw*. A problem concerning the identification of the tomb owner exists however, since, as in similar cases, it is not possible to determine whether this fragment was an original piece of the tomb or was brought from elsewhere and reused for the filling of the shaft only. Brovarski⁸¹ nevertheless considered the tomb owner to be employed in the service of *sndm-ib* family.

G 2338 B: In the debris of the shaft was found a fragment of an inscribed architrave with the representation of the owner *ttw* and his wife in sunk relief (pl.4.7). The horizontal frieze of inscription mentions a scribal title of the owner and the phrase *im3ḥw ḥr ntr ʿ3 inti*. The meaning of this line can be comprehended in two different ways. Reisner⁸² has apparently interpreted it as the end of a traditional offering formula for a person named *inti*. However it seems more likely that the *inti* mentioned in this context is the patron of the owner *ttw*, following the model composition of the comparable architraves of the *sndm-ib* family associates.

G 5551: A relief fragment found in shaft G 5551 A (pl. 4.8) carries inscriptions mentioning, along with the titles of the anonymous owner and his wife, a person named *inti*, a clear

⁸¹ BROVARSKI, *Giza VII*, 3.
⁸² REISNER, *Additions*, 56h.

reference to *sn̄dm-ib inti* (G 2370). The last named person was preceded by the phrase *im̄3ḥw (hr)* suggesting that he was featured as the patron of the family.

G 2366: The mastaba of *ni-msti* is a small structure built against the east face of G 2360 probably without relation to the owner of the larger mastaba⁸³. Inscriptions on stela of the tomb state the names and titles of the tomb owner, his wife and two sons. Brovarski⁸⁴ listed this tomb among those of the priests of the *sn̄dm-ib* family, with no presented justification. It is true that *nmsti* carries the titles *my-ḥt ḥm-k3* and *imy-r3 pr* but the connection to the funerary service of the *sn̄dm-ib* family in particular is missing.

G 2461': The wife of the mastaba owner is named *sn̄dmt-ib*, which might imply her husband's involvement in the service of the *sn̄dm-ib* family cult. At 85 m of distance, G 2461' is however not located in the immediate vicinity of *sn̄dm-ib* complex and no pictorial representation typical to the *sn̄dm-ib* family personal was found in this tomb. Again this tomb was included though in the above mentioned list presented by Brovarski for the *sn̄Dm-ib* family priests.

2-F The royal family

A remarkable case in CEE shows a tomb owner who was involved in the service of other tombs located outside of the cemetery proper. As stated by his titles, *ḥm-nw*, the owner of a medium sized mastaba (G 5210), served several members of the royal family of the Fourth Dynasty as *imy-r3 pr*. While one of his employers is buried in the CEE *dw3-n-r^c* (G 5110), the tombs of the other three are located in the ECE: *k3-w^cb* (G 7110-7120), *ḥtp-ḥr.s II* (G 7350) and *mr.s-ḥnh* (G 7530 sub). The four served persons represent three generations of the descents of king Khufu.

Reinforcing the association suggested by the inscriptional evidence was an incident of pictorial representation. *ḥm-nw* and his son *ḥm-tn-nds* were represented in the mastaba of *mr.s-ḥnh III*. On the south jamb of the chapel and on the west wall of the main chamber of *mr.s-ḥnh III*⁸⁵, a priest named *ḥm-nw* presents *mr.s-ḥnh III* a document⁸⁶. In such an inferior representation to the owner of the tomb, *ḥm-nw* might be presenting a statement of the activities he carried out. The contents of the document can equally be assumed to be a list of

⁸³ SIMPSON, *Giza IV*, 32.

⁸⁴ BROVARSKI, *Giza VII*, 3.

⁸⁵ FLENTYE, *Bulletin of the Egyptian Museum* 3, 71–82.

⁸⁶ SIMPSON, *Giza I*, 4, pl. II c, fig. 3 b.

provisions. *hm-nw-nds* is represented in the same attitude on a pillar in the west room of the chapel⁸⁷.

Three niches at the main room of the chapel of *mr.s-nh* III contained five rock cut statues in scribal position. Though uninscribed, Reisner⁸⁸ attributed these figures to *hm-nw*, *hm-nw-nds* and the children of the latter whose names and titles are not attested elsewhere. While Reisner believed that the statue of *hm-nw* at least was sculptured while he was supervising the construction of the chapel, Smith⁸⁹ remarked that it is possible that *hm-nw* hid his statue from his patroness, a situation similar to the supposed hidden reliefs of Senenmut at Deir el Bahri.

⁸⁷ SIMPSON, *Giza I*, fig. 12.

⁸⁸ REISNER, *BMFA* 25, 70.

⁸⁹ SMITH, *Egyptian sculpture*, 44.

Chapter Five

A Prospographical Study of Tomb Owners in CEE

1-On the classification of the OK titles

The most abundant source expressing state administration during the OK is doubtless the corpus of titles of officials documented in their tombs. There are chiefly two suggestions on how such titles should be interpreted. Baer¹ and Andrassy² suggested that they represented the accumulation of positions acquired by the person during his life time. Helck³ on the other hand believed that they deliver the professions practised by the owner in the time of his tomb decoration so that the career of an official can not be reconstructed from such inscriptions.

While there are several suggestions concerning the classification of the OK titles, the frequent primary division usually differentiates between three major types according to their logical sense as the following⁴:

1- Titles which convey a rank of honour in the royal court rather than an office. The common examples of this title type include *rh-nzwt*, *špss nzwt*, *iry-p^ct*, *h3ty-^c*, *smr*, *sd3wty-bity*, *hry-sšt3* and *hry-tp nzwt*⁵.

2- Titles which express the belonging to a group, examples for which are *z3 nzwt*, *wr-md šm^cw*, and *^cd-mr*.

3- Titles which that express the active practice of a profession within a bureaucracy.

Several attempts were carried out to identify distinctive groups within the last title type. Strudwick⁶ presented a function oriented classification for the highest administrative titles of the OK officials dividing them into six classes: the vizierate, the legal system, the scribal bureaucracy, the organization of labor, the organization of granaries and the organization of treasuries.

Andrassy⁷ on the other hand introduced a classification depending on the nature of connection between the title bearer and the institution or a branch of administration in which he served. His proposal subdivided the profession titles to:

1- Institution titles which attribute the owner to an explicitly named institution like *imy-r3 šnwty*.

2- Function titles which describe a general area of duty, without being limited on a certain institution. These in turn can be divided to:

A- The high controlling offices of administration like *t3yty z3b t3ty* and *imy-r3 šm^c*.

¹BAER, *Rank and title*, 35.

² ANDRASSY, *ZÄS* 118 (1991),1.

³ HELCK, *LÄ VI*, 596-598.

⁴ HELCK, *LÄ VI*, 598.

⁵ HELCK, *Beamtentitel*, 111-119.

⁶STRUDWICK, *Administration*, xiv. See supra p. 30 for the representative titles of each type.

⁷ANDRASSY, *ZÄS* 118,1-10.

B- Titles linked to a department like *imy-r3 k3t nbt nzwt*.

C- Relatively unspecified titles like *imy-r3 wpwt* whose bearers were apparently engaged in several operations.

Because the above division depends on the external appearance of the titles, Andrassy presented another classification which modifies the above suggestions of Strudwick:

1- Administration of the economic system: This department is comprised in the majority out of scribes whose mission was to issue, to archive, to analyse and to consign documents. Not all scribes are however associated with this department but only those who functioned in the central authority which carried out the administrative requirements and the organising basis for the counts in the country. Missions of workers in this department included the systematic examining of the working force and the taxes and to some degree their redistribution as well. The core of this administration was formed by the central documents department which was concerned with management of the *ꜥ-nzwt*, the *wḏw*, the *pr-md3t* and the *pr ḥry-ḥtm-md3t*. There existed as well other institutions and groups which were concerned with the central origination of resources like for instance the *pr ḥry-wḏ*, the *st-df3*, the *pr-šnꜥ* and the *mrt*-people

2- Administration of grains (the *šnwt*): headed by *im-r3 prwy-šnwt(y)*, this department was charged with the documentation and distribution of the grain resources.

3- Administration of production: This department includes titles which are connected with the *pr-ḥḏ* and its subdivision.

4- Administration of building and expeditions: The head of this department was the *imy-r3 k3t nzwt*. The subordinates included among others scribes, craftsmen and the officials who are connected with expeditions.

5- The judicial system: headed by the *imy-r3 ḥwt wrt 6* on the top of its hierarchy. Persons with titles connected with *ḥwt wrt* belonged to this department as well.

6-Provincial administration: which included all the functions outside the capital.

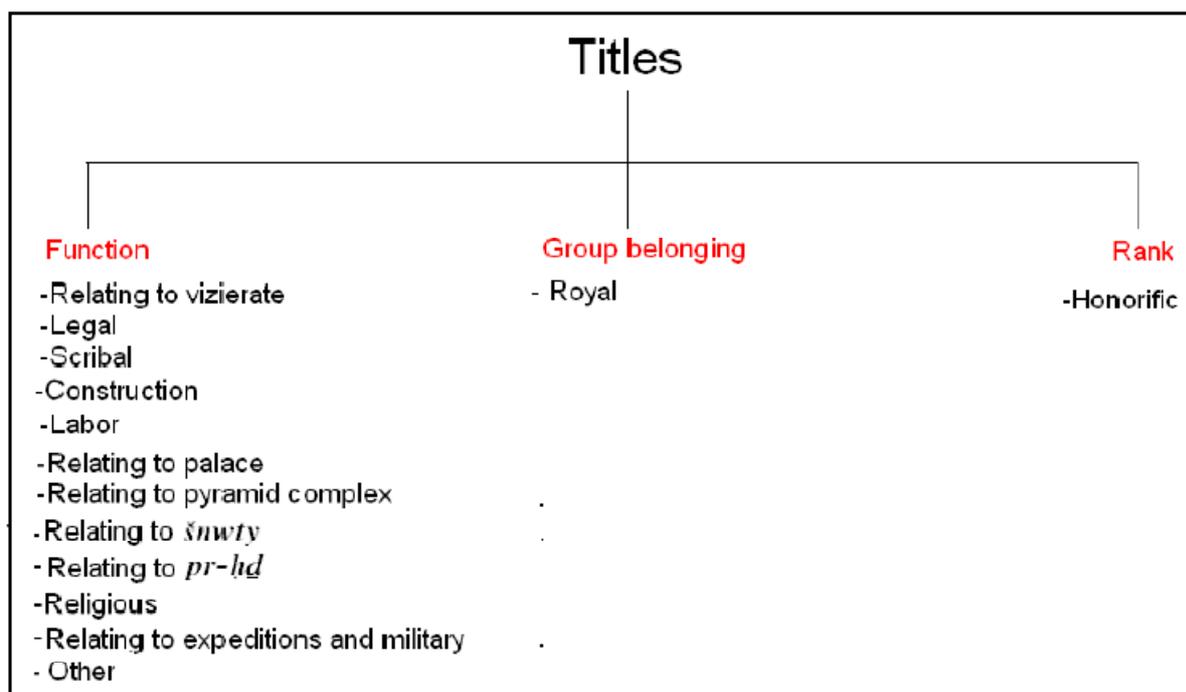
In addition to these large scale classifications of titles, several attempts were also carried out to classify the titles of a limited group of officials who carried a specific title. Piacentini⁸ for instance divided the titles of his *ḥk3 ḥwt* officials into seven groups: administration and royal foundation titles, religious titles, palace titles, nautical and military titles, labour titles, treasury titles and vizier's bureau and legal titles.

As already noticed from the above, there exist wide deviations between the concepts of scholars concerning the division of administration departments of the state. Even when such divisions are set, we still do not know exactly in how far the division of duties and the separation between

⁸PIACENTINI, *ḥk3w ḥwt*, 236 ff.

departments were strict in the practice of administration during the OK, making it often hard to attribute a certain title to one or another field of administration. Moreover, the inner organisation of each department is often difficult to reconstruct as variations of the same title within many professions do not form a regular hierarchy but give rather the impression that different versions of the same title existed parallelly.

The title classification which was used for the purposes of this study is at the first step the primary classification of titles to: rank, group belonging and function titles. To the division of rank titles belong those titles which were described elsewhere in this study by honorific titles because they do not express the practice of a duty and are not connected with a certain post. The group belonging division includes a large number of titles of which only the royal titles will be dealt with here. For the sub-classification of the division of function titles a combination of the Strudwick and Andrassy suggestions was used, adding another title category here for convenience: the religious titles. The last title type includes all the priestly titles connected with the pyramids, kings, temples, and tombs. The complete classification system is summarised in the below graph.



In the following is a discussion for the titles of the three divisions, the tomb sizes of their bearers and the spatial-temporal distribution of their tombs within CEE.

1-1 The viziers

While usually referred to as vizier, a term first introduced by Meyer⁹, the complete translation of the

⁹MEYER, *Geschichte*, 62.

OK version of the title *ḥꜣty zꜣb ḥꜣty* is "he of the curtain chief justice and vizier"¹⁰. This title appeared for the first time on a stone jar that dates back to the Second Dynasty¹¹ and by the OK it became the highest title whose holder controlled all the departments of state being on the head of administration directly after the king¹². A NK text explains the "the duties of the vizier"¹³ which comprised three main tasks: the direction of the palace complex, the heading of the civil administration and the functions of the king's deputy. According to that text, which might have its origins in the MK¹⁴, the vizier is responsible for the order, security, justice and for personnel in the palace complex. Known OK viziers have been listed by Kanawati¹⁵ (41 viziers), Strudwick¹⁶ (63 viziers) and Barta¹⁷ (69 viziers).

Eleven bearers of this title have their tombs in CEE (map 5.1). The viziers' tombs are distributed almost evenly in CEE, showing no spatial concentration in one location. It is true that six viziers are buried in the *snḏm-ib* complex but the fact that those six tombs belong to a family complex should exclude the holding of the vizier function the reason behind this cluster. The range of the areas of the eleven viziers' tombs is surprisingly huge being between 4,5 m² to 1304,7 m². On the seriation graph 3.2 these tombs extend between positions 14 until 243. The dating estimates as suggested by several scholars for those eleven tombs extend as well over a long period of time since the end of the Fourth dynasty until the late OK¹⁸, which is also the approximate time line for the establishment and growth of CEE. The proposed kings whom these viziers served are: Menkaure, Sahure, Isesi, Unas, Teti and Pepi II. Periods of occupying the office at the head of the vizierate by those nine tomb owners are a subject of scholarly discussion summarised below.

G 5110: *dwꜣ-n-rꜥ* was in the opinion of Strudwick¹⁹ the last of an unbroken line of viziers who were related to the king by blood, although the kinship to the royal family is not certain in this case. According to the same author *dwꜣ-n-rꜥ* served in the period from the reign of Menkaure to the early Fifth Dynasty. An earlier scholar, Smith²⁰, suggested that *dwꜣ-n-rꜥ* was the first vizier under Menakure, and Kanawati²¹ agreed to the placement of his office in the reign of Menkaure.

G 5150: *sꜣꜣt-ḥtp hti* seems to have received the promotion to the vizieral office after the

¹⁰JONES, *Titles, 1000*; STRUDWICK, *Administration*, 304-306.

¹¹HUSSON & VALBELLE, *Institutions*, 36.

¹²MALEK, *Pyramids*, 94.

¹³BOORN, *The Duties of the Vizier*, 369-381.

¹⁴QUIRKE, *Titles*, 18.

¹⁵KANAWATI, *Administration*, 10.

¹⁶STRUDWICK, *Administration*, table 28, 301-3.

¹⁷BARTA, *Archiv Orientali* 67 volume 1, 12, note 52.

¹⁸For dating estimates see the corresponding tomb number in chapter: dating and sequence of building.

¹⁹STRUDWICK, *Administration*, 338.

²⁰REISNER and SMITH, *Giza II*, 11.

²¹KANAWATI, *Administration*, 11

compilation of his tomb since the highest title there is only the *imy-r3 k3t nzwt*, while the vizieral title was inscribed on a nameless pair statue found in the serdab. Because *sš3t-ḥtp* is not given the titles of vizier on the walls of his tomb, Junker suggested that the statue represents *sš3t-ḥtp*'s parents²². Helck²³, Schmitz²⁴ and Strudwick²⁵ found it however more likely that this statue belongs to *sš3t-ḥtp* himself, probably having been placed in his tomb after the completion of the decoration. Since the tomb was dated by Strudwick based on stylistic grounds to the early Fifth Dynasty, the same author believed that *sš3t-ḥtp* served Sahure as vizier.

G 5230: Though one of *b3-b3.f*'s titles has the phrase *n it.f* which usually refers to a real royal affiliation, it seems that he got this epithet through a promotion. Several indications suggest another incident of promotion for the office of vizier after the completion of the tomb in the case of *b3-b3.f* as well. Strudwick²⁶ traced the occurrence of *b3-b3.f*'s titles on nine of his statues and concluded the existence of two phases during the owner's career. In the first phase *b3-b3.f* was *ḥᵀty-ᵀ* and *imy-r3 k3t nbt nt nzwt*, and in the second he was promoted to *t3yty z3b t3ty*. It was by the virtue of the last title that *b3-b3.f* could acquire the *n it.f* phrase. Other pieces of evidence indicate even the existence of another earlier career phase. Several statues found in and near to another tomb in the central field (Hassan no.2) might belong to the *b3-b3.f*. Rezpka²⁷ suggested that *b3-b3.f* had built the tomb in the central field but abandoned it before completion and allowed a member of his family to use the facility. Because Rezpka believed that *b3-b3.f* was a true son of king Khafre, he suggested that the tomb in the central field was built when *b3-b3.f* was only a royal son, with no administrative power. When promoted to the office of overseer of all works of the king, *b3-b3.f*'s might have decided, using the opportunities provided by his new position, to build a new larger tomb. It is also possible that *b3-b3.f* offered his tomb to a suddenly deceased member of his close family who did not have a tomb for himself. Kanawati placed *b3-b3.f* directly after *dw3-n-rᵀ*, believed by Reisner to be his father, while Strudwick inserted *sšt-ḥtp ḥti* between the two viziers.

G 5170: The tomb of *sšm-nfr* III showed the titles *smr wᵀty* and *z3 nzwt n ḥt.f* only on the south wall of its chapel, giving rise to the assumption that the owner received the two titles after a promotion in a period near the completion of his tomb²⁸. Strudwick²⁹ believed that *sšm-nfr* III

²²JUNKER, *Giza* II, 179ff.

²³HELCK, *Beamtentitel*, 135.

²⁴SCHMITZ, *Königssohn*, 74.

²⁵STRUDWICK, *Administration*, 137.

²⁶STRUDWICK, *Administration*, 82-3 (42).

²⁷RZEPKA, *MDAIK* 56, 353-60.

²⁸BRUNNER-TRAUT, *Seschemnofers III*, 16.

²⁹STRUDWICK, *Administration*, 140.

received his promotion to vizierate after most of the decoration of his tomb had been completed, perhaps placing his vizierate in the reign of Isesi. Kanawati considered *sšm-nfr* III the fourth vizier of the same king.

G 2370: Though *sndm-ib inti* does not relate his career in the early period of his life, his tomb has names of domains of Userkaf, Sahure, Neferirkare, Niussere and Menkauhor, which might indicate favours given to him by some of these kings. One of the letters of king Isesi to *sndm-ib inti* should date either to the sixteenth or the twenty-sixth numbering. In the heading of the letter *inti* is addressed as vizier, a circumstance that seems to date his tenure of office to the second half of Isesi's reign³⁰. As Smith³¹ observed Grdseloff³² misinterpreted the statement of the length of time during which *sndm-ib inti* served under Isesi as a date in year 5 of that king. Edel³³ who thought *min* to be meaning "honor," translated the same passage: "5 Jahre, 4 Monate, 3 Tage (alt) ist meine *mjn* bei Jzezi; siehe ich bin angesehen bei Jzezi".

That *inti* was depicted on the side walls of the portico of his tomb in the very long kilt worn by elderly men in the OK is usually interpreted as an indication that he held the vizierate in his later years. Upon *inti*'s death, his son, *sndm-ib mhi*, obtained several agreements and objects for the tomb from the king, who is not named. Strudwick³⁴ found some evidence that the king maybe Unas for his cartouche was found in the gap left by Lepsius above the head of a figure of *mhi*. Consequently *inti* might have died at the earliest at the very end of the reign of Isesi. He seems thus to have been the latest of Isesi's viziers.

G 2378: Inscriptions in *sndm-ib mhi*'s tomb mention that he was *ir ḥsst issi, šḥ3 n nzwt-bity wnis*. The last phrase might indicate that he already had a flourishing career under Isesi and that he was honoured by king Unas for that reason. Brovarski³⁵ suggested that Unas "remembered" *mhi* by appointing him to the vizierate. The period within the reign of Unas during which *mhi* held the vizierate was estimated to be in the middle of that reign by Strudwick³⁶ with two viziers intervening between *inti* and *mhi*, while Kanawati³⁷ placed *mhi* at the end of the reign of Unas with four viziers between the father and the son.

G 2374: *hnm-inti* was active in the reigns of Unas and Teti whose cartouches appear in his tomb.

³⁰BROVARSKI, *Giza VI*, 23.

³¹SMITH, *JNES* 11, 123.

³²GRDSELOFF, *ASAE* 42, 59

³³EDEL, *MIO* 1 [1953], p. 215 [7].

³⁴See supra p. 115.

³⁵BROVARSKI, *Giza VII*, 30.

³⁶STRUDWICK, *Administration*, 133 (121)

³⁷KANAWATI, *Administration*, no. 294.(216).

An apparently younger brother than *sndm-ib mḥi*, his vizierate must be placed later in time as well. Strudwick³⁸ believed that he served kings Unas and Teti as vizier.

G 5550: Baer³⁹ has remarked that this mastaba is rather small for the rank of its owner, *nfr idw I*, but the small size of this tomb seems to be only an indication to its period of construction. Since other persons of the same rank dating to the period between the reign of Pepi I to early Pepi II had tombs with similar small sizes, Strudwick⁴⁰ believed that *nfr Idw I* held the vizierate in the mentioned period.

G 2381 A: The title of vizier appears nowhere on the coffin of *mry-rꜥ-mry-ptḥ-ḥnh ptḥ-špss impy* discovered in his sloping passage shaft G 2381 A but was inscribed only on some serdab blocks whose origin is unknown. Reisner⁴¹ believed that the origin of these blocks is G 2385 whom he attributed to *mr-ptḥ-ḥnh-ppy*, a brother of *nḥbw* mentioned in the latter's tomb (G 2381). He did not however explain the reason why *impy* would place his serdab in the mastaba of his uncle. This circumstance is otherwise usually taken as an evidence that *impy* may have been promoted to the vizierate after he inscribed his coffin. Strudwick placed his office in the first half of the reign of Pepy II because the decoration of the part of the temple Pepy II in which he appears seems to have been completed around years twenty to thirty of this king⁴².

G2381 A, G 2381 C, G 2386 C2: Two sloping passage tombs and one chapel are associated with one person: *ptḥ-z3bw ibbi* who was also represented as the son of *nḥbw* in G 2381. There he carries scribal, honorific, pyramid service and religious titles, certainly more than the norm for a person who is not represented as the main tomb owner, but no vizieral titles are mentioned thereon. In G 2381 A his name was inscribed over a coffin whose ownership is controversy, but again no vizieral titles are present on the coffin. The vizieral title of *ibbi* was recovered from several blocks of his serdab, most probably attached to his chapel G 2386 C⁴³. Strudwick placed the office of *ptḥ-z3bw ibbi* as vizier towards the middle of the reign of Pepi II.

G 2383: Strudwick believed that the tomb of *wr-k3w-b3 ikw* was one of the latest in CEE because of the small size of the offering room and the insertion of the tomb among those of the *sndm-ib*

³⁸STRUDWICK, *Administration*, 128 (113).

³⁹BAER, *Rank and title*, 62 (78)

⁴⁰STRUDWICK, *Administration*, 68-9 (22).

⁴¹REISNER, *sndm-ib*, 173.

⁴²STRUDWICK, *Administration*, 96.

⁴³BROVARSKI, 'The Sendjemib Complex', 2, 118.

family presumably after the principal interments, the latest of which (G 2381 A) dates in all likelihood to the reign of Pepy II. The vizierate of *wr-k3w-b3 ikw* should be consequently in the late OK.

1-2 The directors of work

While titles beginning with *imy-r3 k3t* were attested since the Fourth Dynasty, the earliest holders of *imy-r3 k3t (nt) nzwt* are recorded slightly before the reign of Neferirkare⁴⁴. With the multiplication of the number of titles characteristic for the Fifth and Sixth Dynasties, the functions of the overseer of works were divided, some being carried out by the holders of the *imy-r3 k3t nbt (nt) nzwt* and other practised by the *imy-r3 k3t (nt) nzwt*⁴⁵. The directors of all the king's works were responsible for the organizational and logistic aspects of the royal works taking a leading role in the process of the planning, the founding and the building of construction projects⁴⁶.

Tomb number	owner	title
G 2370	<i>sndm-ib inti</i>	<i>imy-r3 k3t nbt nzwt</i>
G 2374	<i>hnm-inti</i>	<i>imy-r3 k3t nbt nzwt</i>
G 2378	<i>sndm-ib mhi</i>	<i>imy-r3 k3t nbt nzwt</i>
G 2381	<i>nhibw</i>	<i>imy-r3 k3t nbt nzwt</i>
G 2381 A	<i>impy</i>	<i>imy-r3 k3t nzwt</i>
G 2384	<i>(snd)m-ib</i>	<i>imy-r3 k3t nbt nzwt</i>
G 4940	<i>sšm-nfr I</i>	<i>imy-r3 k3t nzwt</i>
G 5080	<i>sšm-nfr II</i>	<i>imy-r3 k3t nbt nzwt</i>
G 5150	<i>sšt-htp hti</i>	<i>imy-r3 k3t nbt nzwt</i>
G 5230	<i>b3-b3.f</i>	<i>imy-r3 k3t nbt nzwt</i>
G 5370	<i>d3ty</i>	<i>imy-r3 k3t nbt nzwt</i>
G 5520	<i>s-nh-ptḥ</i>	<i>imy-r3 k3t nzwt</i>
G 5550	<i>nfr idw I</i>	<i>imy-r3 k3t nbt nzwt</i>

Of the 49 directors of work attested in the Memphite cemetery⁴⁷, 13 are buried in CEE, of which three are *imy-r3 k3t nt nzwt* (map 5.2). Worthy of mention is that seven of the directors of the work of the king in CEE are also viziers. The tombs of directors of work range in area between 9 to 704 m². Their positions on seriation graph 3.2 are between 12 to 241.

⁴⁴ EYRE, "Work and the Organisation of Work", 5-47.

⁴⁵ STRUDWICK, *Administration*, 217.

⁴⁶ KREJČÍ, "Overseers of Works", 67.

⁴⁷ According to the list of STRUDWICK, *Administration*, 218-220.

1-3 The overseers of *pr(wy)-ḥd*

The *pr(wy)-ḥd*, usually translated as the treasury⁴⁸, appears to have been an important economic administration during the OK. The exact nature of the *pr-ḥd* department, which is attested since the First Dynasty⁴⁹, is not fully understood by us. Andrassy⁵⁰ believed that the *pr-ḥd* represented a large production department which included in its subdivision the administration of linen and the weapon house (*pr-ḥ3*), the two-chambers of the king's adornments (*izwy n ḥkr nzwt*), the two gold houses (*prwy nbw*), the special food supplies (*df3w bity*) and the workshop (*wḥbty*).

To the responsibilities of this great department would have thus belonged the storing, the partly manufacturing and the administration of the state incomes of wine, oil, wax and wood, the products from the workshops, the weaving mills and the distance trade so that it shows also connections with the building and the expedition departments. Since however the responsibilities covered by the *pr(wy)-ḥd* as proposed by Andrassy are so broad, the officials in those fields cannot represent a homogeneous group for a social oriented study. The titles *imy-r3 pr-ḥd* and *imy-r3 prwy-ḥd* were taken, following Strudwick⁵¹, to represent the overseers of this department for the purpose of the present analysis. Three tomb owners in CEE have one of these two titles (G 2370, G 2374, G 5550), all of whom are viziers (map 5.3). Their tombs range in area between 77 and 472 m² occupying advanced positions on the seriation graph 3.2 (214-241). No other *pr-ḥd* titles were attested for their dependants or elsewhere in CEE.

1-4 The overseers of *šnwt*

While the appearance of the word *šnwt*, understood as a rule as a storehouse for threshed grain, can be traced back to the archaic period, the earliest granary titles date to the Fourth Dynasty⁵². Such titles refer to the granary either as *šnwt* or in the dual form of the word *šnwtj*. The later form is believed to imply a central administration over Upper and Lower Egypt⁵³. During the Fifth and Sixth dynasties, the viziers acted as *šnwtj* overseers as well⁵⁴ with 22 viziers of the OK holding the title *imy-r3 šnwtj*. Evidence exists to indicate that some of those viziers were awarded the position in the granary before their tenure of the vizierate⁵⁵. In spite of the gradual dissolution of the central authority close to the end of the OK, titles of the granary survived till the end of this period which

⁴⁸STRUDWICK, *JEA* 71 (1985), 43ff.

⁴⁹KAPLONY, *Inschriften*, taf. 37 (121)

⁵⁰ANDRASSY, *ZÄS* 118,6; STRUDWICK, *RdE* 38, 143.

⁵¹STRUDWICK, *Administration*, 276.

⁵²SIEBELS, *BACE* 12, 85-99. (fig.).

⁵³HELCK, *Beamtentitel*, 64.

⁵⁴SCHMITZ, *LÄ V*, 594.

⁵⁵STRUDWICK, *Administration*, 264.

indicates that the management of the granary was an essential office, playing a major role in providing the population with grain.

Five of the forty known OK overseers of granaries⁵⁶ are buried in CEE (map 5.4) (G 2370, G 2378, G 2374, G 5550, G 5560). Except the last mentioned of these tombs, in which the occurrence of the title is not certain⁵⁷, all of the *imy-r3 šnwt* were viziers. Their tombs range between 70 and 470 m² in area occupying the positions 214 to 241 on seriation graph 3.2. Three *imy-r3 šnwt* were active in the *pr-ḥd* as well, which shows the close association between the two departments. Three *imy-r3 šnwt* are members of the *sndm-ib* family, which might suggest that the position had a hereditary bond in particular cases. Nevertheless, among the 44 dependants who are mentioned in the tombs of the four *imy-r3 šnwt* buried in CEE, none carries a title connected with the *šnwt*.

1-5 The overseers of expeditions

The title *imy-r3 wpwt*, usually translated as overseer of commissions-apportionments⁵⁸, appeared in the titularly of the expedition leaders in the Fourth and Fifth Dynasties. Though it is not possible to determine accurate duties of the title holders in relation to other titles held by expedition leaders, it is imaginable that the *imy-r3 wpwt* were responsible for the general organisation of the expeditions⁵⁹. Four tomb owners in CEE carry the title *imy-r3 wpwt* (map 5.5) (G 5340, G 2421, G5330, S 766). Their tombs range between 41 and 496 m² in area occupying positions between 28 and 231 on the seriation graph 3.2.

1-6 The holders of labour titles

This category includes those titles which convey the meaning of the involvement in building activities but not the heading of the department of construction contrary to *imy-r3 k3t (nbt) nzwt* title. The root *ḳd*⁶⁰, which means to build, to fashion or to create, was taken as a mark for the titles which are connected with various construction activities.

Tomb number	Owner	Titles
G 2381 A	<i>mry-r^c-mry-ptḥ-^cnḥ</i> <i>ptḥ-špss</i> <i>impy</i>	<i>mdḥ ḳd nzwt m prwy</i>
G 2374	<i>ḥnm-inti</i>	<i>mdḥ ḳd nzwt m prwy</i>
G 2381	<i>mr-ptḥ-^cnḥ-mry-r^c nḥbw</i>	<i>mdḥ ḳd nzwt m prwy, ḳd nzwt m</i>

⁵⁶List of overseers of granaries as given by STRUDWICK, *Administration*, table 20, 252-254.

⁵⁷See document of tomb in supra p. 86.

⁵⁸JONES, *Titles*, 88.

⁵⁹MARTIN-PARDEY, *SAK* 11, 233.

⁶⁰DORMAN, *Faces in Clay*, 52.

		<i>prwy</i>
G 2378	<i>šndm-ib mḥi</i>	<i>mdḥ ḳd nzwt m prwy</i>
G 2370	<i>šndm-ib inti</i>	<i>mdḥ ḳd nzwt m prwy</i>

The title *mdḥ ḳd nzwt*⁶¹ is widely translated as the king's architect. In the simple form, the *mdḥ ḳd nzwt* is a middle ranking title superior to *šḥd ḳdw* but inferior to *imy-r3 ḳ3t n nzwt*⁶². The addition of the word *prwy* to the title on the other hand might refer, as in the case of all dual titles, to the dominance of a central administration over Upper and Lower Egypt. 5 holders of the title *mdḥ ḳd nzwt m prwy* are buried in CEE (map 5.6), all of whom are members of the *šndm-ib* family which might show the hereditary nature of the title. Tombs of *mdḥ ḳd nzwt m prwy* in CEE range in area between 9 and 479 m² and their positions on the seriation graph 3.2 are between 225 and 241.

1-7 The scribes

The management of documents was one of the most important functions of the residence during the OK. Terms that refer directly to the handling of documents are often vague, the clearest expressions being the *pr-md3t* and the *ꜥ nzwt*⁶³. The *md3t* and *ꜥ* were two types of documents which were apparently issued by the orders of the king. Andrassy concluded that the scribes of the *md3t* and *ꜥ* documents were a distinct from the ordinary scribes⁶⁴. Scribes employed in the management of documents were meticulous record keepers noting down every possible transaction, including the building supplies, tools and craftsmen's requisites, work attendance, wages paid, taxes, accounts and so forth.

Tomb number	Owner	<i>zš</i>	<i>ꜥ nzwt</i>	<i>md3t ntr</i>	<i>z3b</i>	Other
S 508-658	anonymous	<i>imy-r3 zš</i>				
G 5480	<i>ḥti</i>	<i>imy-r3 zš</i>				
<i>k3-nfr</i> III	<i>k3-nfr</i> III	<i>imy-r3 zš</i>				
G 5170	<i>sšm-nfr</i> III	<i>imy-r3 zš</i>	<i>imy-r3 zš ꜥ nzwt</i>			
G 5080	<i>sšm-nfr</i> II		<i>imy-r3 zš ꜥ nzwt,</i>			<i>zš nzwt</i>
G 2370	<i>šndm-ib inti</i>	<i>ḥrp zšw</i>	<i>imy-r3 zš ꜥ nzwt</i>			
G 2180	anonymous		<i>imy-r3 zš ꜥ nzwt</i>			

⁶¹JONES, *Titles*, 1733.

⁶²HARVEY, *Wooden Statues*, 610.

⁶³ANDRASSY, "Untersuchungen", 46-60.

⁶⁴ANDRASSY, *Institutions*, 47

G 4940	<i>sšm-nfr I</i>		<i>imy-r3 zš hrt</i> ° <i>nzwt</i>		
G 2378	<i>sndm-ib mḥi</i>		<i>imy-r3 zš</i> ° <i>nzwt</i>		
G 2374	<i>ḥnm-inti</i>		<i>imy-r3 zš</i> ° <i>nzwt</i>		
G 5150	<i>sšt-ḥtp ḥti</i>			<i>imy-r3 zšw</i> <i>md3t ntr</i>	
G 5560	<i>k3-ḥr pth ft-</i> <i>k3</i>				<i>z3b imy-r3 zš</i>
G 5520	<i>s-ḥp-ḥtp</i>	<i>shd zš</i>			<i>z3b imy-r3 zš</i>
G 5130	<i>tṯi</i>	<i>zš</i>			
G 5032	<i>rdi-ns</i>	<i>zš</i>			
G 2332	anonymous		<i>zš nzwt m</i> <i>ḥwt-ntr ppi</i>		
S 700	<i>nsw-ptḥ</i>		<i>zš</i> ° <i>nzwt ḥr</i> <i>ḥt.f, zš</i> ° <i>nzwt</i> <i>pr-ḥ3, zš</i> ° <i>nzwt pr-ḥ3 ḥr</i> <i>ḥt.f</i>		
G 5280	<i>ph-n-ptḥ</i>		<i>zš</i> ° <i>nzwt</i>		
G 2364	<i>sndm-ib</i>		<i>zš</i> ° <i>nzwt ḥft</i> <i>ḥrss n s3 pn</i>		
G 5550	<i>nfr idw I</i>		<i>zš</i> ° <i>nzwt,</i> <i>imy-r3 zš</i> ° <i>nzwt</i>		
<i>idw II</i>	<i>idw II</i>		<i>zš</i> ° <i>nzwt, zš</i> ° <i>nzwt ḥr ḥt.f,</i> <i>shd zš</i> ° <i>nzwt</i>		
G 2461´	<i>msi</i>		<i>zš</i> ° <i>pr-ḥ3 nzwt</i> <i>ḥft ḥr</i>		
G 5110	<i>dw3-n-rḥ</i>		<i>mdḥ zšw</i> <i>nzwt</i>	<i>zš md3t-ntr</i>	
S 660-661	<i>shḥm-ḥnw-</i> <i>ptḥ</i>				<i>zš n s3 ḥmw-</i> <i>k3</i>
G 5270	<i>rḥ-wr I</i>		<i>zš ḥryt</i> ° <i>nzwt, zš nt</i> ° <i>nzwt, zš</i> ° <i>nzwt ḥft-ḥr</i>		
<i>st-k3</i> and <i>ptḥ-ḥtp</i>	<i>st-k3</i>				<i>ḥrp zš m wdt</i> <i>wrt, ḥrp zš m</i> <i>wdt wrt nt</i> <i>ntr ḥ3, ḥrp zš</i> <i>m wdt wdḥ</i> <i>mdw šṯ3 n</i> <i>ḥwt wrt.</i>

G 2337-X	<i>d3ti</i>				<i>z3b šḥd zš,</i>	<i>hrp zš, imy-r3 zš s3</i>
<i>ᶜnh-wd3 iti</i>	<i>ᶜnh-wd3 iti</i>		<i>zš ᶜ nzwt ḥft</i> <i>ḥr</i>			

As the above table demonstrates, 28 bearers of scribal titles are buried in CEE (map 5.7). Their scribal titles can be subdivided according to their hierarchy into three categories: the *zš*, the *ᶜ nzwt*, the *md3t ntr* and the scribal titles beginning with *z3b*. Each of these categories had many variations of titles summarised in the above table. The sizes of the scribes' tombs show a very wide range being between 3 and 1304 m² in area and their positions on the seriation graph 3.2 are widely distributed as well being between 12 and 241. 79 family members are mentioned in 16 tombs of bearers of scribal titles. Among these, the only family member who carries in turn a scribal title is represented G 5150 *shnt-k3* who was active like his father *sš3t ḥtp-ḥti* in the *pr md3t*.

1-8 The holders of legal titles

Several key words are used in scholarly research to trace the officials employed in the judicial and legal departments. The most common of such phrases is *ḥwt-wrt* which was attested for the first time in the Fourth Dynasty⁶⁵. It though only in the reign of Niuserre that the two main titles comprised out of this term, the *imy-r3 ḥwt wrt* and the *imy-r3 ḥwt-wrt* 6, appeared. The available pieces of evidence about the *ḥwt-wrt* designates it to be the main judicial body in all fields: royal and provincial, secular and religious.

Another term which indicates an activity in the judicial field is *z3b*, a word which seems to deliver the plain meaning of a judge⁶⁶. When employed in titles, the word *z3b* can either be used alone or as an element of other longer titles, the most frequent of which is *z3b ᶜd-mr*. The last mentioned title indicates an association with a judicial position only when it is held by the main owner of the tomb since Helck⁶⁷ believed that the status of title *z3b ᶜd-mr* was lowered when it became a characteristic rank title for the sons of officials, its meaning becoming thus more or less conventional in the later case.

Titles connected to the *wdᶜ-mdw* seem to be in association with the judicial department as well since the meaning of the first element (to divide, to split, to separate) can as well be interpreted as "to judge"⁶⁸. Other titles were considered to be associated with this division of administration by

⁶⁵HUSSON AND VALBELLE, *Institutions*, 125.

⁶⁶WB III, 421 (7); JUNKER, *Giza VII*, 198ff; HASSAN, *Giza II*, 17; VERNER, *Petahshepses I*, 138, QUIRKE, *RdE 37*, 115.

⁶⁷HELCK, *Beamtentitel*, 114.

⁶⁸BOORN, *JNES 44*, 3.

Husson and Valbelle⁶⁹ because they are frequently held by the bearers of judicial titles, though, if mentioned in another context, they give rather an impression of an honorific rank or a religious function: *mdw rhyt, ny nst hntt, hm-ntr m3t, iry-nhn nd hry-tp nzwt*. The last title in particular was a subject of a lengthy examination by Goedicke⁷⁰. The scholar believed that the title, usually translated as the King's liegeman⁷¹, is linked to the control of the royal land property rather than to the administration of judicial affairs as Junker⁷² had suggested.

Tomb number	owner	<i>imy-r3 hwt-wrt</i>	<i>imy-r3 hwt-wrt</i> 6	<i>z3b d-mr</i>	other
G 5530	<i>ihy</i>	•			
G 2374	<i>hnm-inti</i>		•		
G 2383	<i>wr-k3w-b3 ikw</i>	•			
KA-nfr III	<i>k3-nfr III</i>			•	
G 4970	<i>nzwt-nfr</i>				<i>z3b hry-sšt3</i>
G 5040	<i>b3-špss</i>			•	
G 5170	<i>sšm-nfr III</i>			•	
G 5280	<i>hti</i>				<i>z3b</i>
G 5470	<i>r^c-wr II</i>				<i>z3b</i>
<i>nh-wd3-iti</i>	<i>nh-wd3-iti</i>				<i>z3b imy-r3 zš</i>
<i>st-k3</i>	<i>pth-htp</i>				<i>z3b šhd zš, z3b imy-r3 zš</i>
<i>st-k3</i>	<i>st-k3</i>			•	<i>z3b šhd zš, z3b imy-r3 zš, z3b imy-r3 zš wd mdw št3, z3b imy-r3 zš wd^c mdw št3 hwt-wrt</i>
G 2475	<i>sn-nh-wr</i>				<i>z3b</i>
G 2423	<i>mhw</i>				<i>z3b iry-nhn</i>
G 5520	<i>s-nh-ptḥ</i>			•	
G 5550	<i>nfr idw I</i>			•	
G 2370	<i>šndm-ib inti</i>			•	
G 4940	<i>šsm-nfr IV</i>			•	

As summarised in the above table, there are 17 bearers of legal titles in CEE, 5 of whom are viziers (map 5.8). The variations of title *z3b d-mr* constitute the majority of legal titles in CEE (13

⁶⁹HUSSON & VALBELLE., *Institutions*, 125

⁷⁰GOEDICKE, "Titles for Titles", , 227-234.

⁷¹JONES, *Titles*, 788.

⁷²JUNKER, *Giza VII*, 200

out of 16) while only 3 owners have the *ḥwt-wrt* or the *ḥwt-wrt 6* titles. Tombs of legal titles holders range in area between 4 and 476 m². Such tombs do not exhibit a certain spatial concentration in one area of CEE, nor do they belong to a single dating class (position on the stratification chart extends from 19 to 243).

48 family members were depicted in those 16 tombs: these are the mothers, brothers, sisters, wives, children and nephews of the owners. No legal titles for the sons or daughters of the deceased were attested except in two cases: *ni-ḥh-ḥrty*, son of *ḥnm-inti* (G 2374), and *r^c-wr*, nephew of *sšm-nfr* III (G 5170) carried the title *z3b*. The fact that the last mentioned low rank title is quite common for the family members of tombs owners during the OK, would allow no conclusion of a hereditary relationship. Moreover another son who carried a title in the legal department, *sšm-nfr* in G 5270, had a father who did not possess any titles in the same department.

The total number of non-family dependants who were represented in the tombs of legal titles holders is 79. While no conclusion could be reached concerning the inheritance of legal titles, evidence relating to an affinity of subordinate employment may exist since 6 of the total 9 dependants carrying legal titles in CEE are employed in the service of tomb owners who carry in turn legal titles. Three of those dependants carry the plain *z3b* title, while other four carry combinations of this title with scribal professions (*z3b zš*, *z3b imy-r3 zš(w)*, *z3b šḥd-zš*). The other dependants represented in tombs of legal titles holders carry the usual titles which are used for the service of tombs owners, above all the *ḥm-k3*, *imy-r3 pr*, *imy-r3 sšr* and the scribal titles of lower rank.

1-9 The holders of palace titles

Among the five principal terms which were used to refer to the royal palace during the OK, namely the: *ḥnw*, *ḥ*, *stp-s3*, *pr-nzwt* and *pr-ḥ3*, the last term is the most common expression as it is attested in a wide range of narrative texts and official titles. The close connection between this term and the daily affairs of the ruling king is perhaps reflected by the fact that the overwhelming majority of *pr-ḥ3* titles were held by men who were buried in the two great Memphite necropolises at Giza and Saqqara while only a small number of *pr-ḥ3* titles is found in the inscriptions of provincial officials⁷³. Although the term *pr-ḥ3* is used primarily in titles concerned with civil matters, there are a few *pr-ḥ3* compounds that may be concerned with functions that were of ritual nature like *ḥm-k3 pr-ḥ3* and *w^cb nzwt n pr-ḥ3*⁷⁴.

Altogether 25 tomb owners in CEE have titles connected to the palace (map 5.9). The majority of those are associated with the *pr-ḥ3* (18 owners), with a fewer number of owners associated with the

⁷³GOELET, *Palace*, 558.

⁷⁴GOELET, *Palace*, 576.

ḥ (7 owners). Their tombs range in area between 6 and 1304 m² occupying positions 12 to 210 on the seriation graph 3.2.

Tomb number	Owner	<i>pr-ḥ</i>	ḥ	<i>hnw</i>
G 5551	anonymous	<i>ḥry-pr ḥ</i>		
G 2184	<i>ḥt mr nzwt</i>	<i>imy-r3 ḥnty-š pr-ḥ, imy-r3 ist n ḥnty-š pr-ḥ</i>		
G5230	<i>b3-b3.f</i>		<i>hrp ḥ</i>	
G 5110	<i>dw3-n-rḥ</i>		<i>hrp ḥ</i>	
G 5540	<i>ḥ3m-k3</i>	<i>šḥd ḥnty-š pr-ḥ, ḥry-pr pr-ḥ</i>		
G 2430	<i>ḥtp-n-ptḥ</i>		<i>hrp ḥ</i>	
<i>ḥtpi</i>	<i>ḥtpi</i>	<i>ḥnty-š pr-ḥ, šḥd ḥnty-š pr-ḥ</i>		
G 2196	<i>i3-sn</i>	<i>ḥnty-š pr-ḥ</i>		
Idw II	<i>idw II</i>	<i>ḥry-tp nzwt pr-ḥ</i>		
G 5040	<i>k3-m-ḥd</i>	<i>zš pr-ḥ, ḥry-sšt3 nzwt m pr-ḥ, šḥd wdḥ mdw m iswt špswt pr-ḥ</i>		
G 5340	<i>k3-s-dw3</i>		<i>hrp ḥ</i>	
G 5530	<i>mmi</i>	<i>ḥnty-š pr-ḥ</i>		
G 5610	<i>mn-ḥbw</i>	<i>šḥd iry-md3t pr-md3t ntr pr-ḥ</i>		
G 2420	<i>ndmw</i>	<i>ḥnty-š pr-ḥ</i>		
<i>nsw-ḥdw II</i>	<i>nsw-ḥdw II</i>	<i>imy-r3 ḥnty-š pr-ḥ, šḥd ḥnty-š pr-ḥ, imy-r3 wpt pr-ḥ, imy-r3 st nty-š pr-ḥ, imy-r3 mdḥ pr-ḥ, iry-ḥtm pr-ḥ,</i>		
G 4941	<i>ptḥ-iw.f-n.f</i>	<i>imy-r3 st ḥnty-š pr-ḥ, im-r3 is n š pr-ḥ</i>		
G 2475	<i>sn-ḥnḥ-wr</i>	<i>ḥnty-š pr-ḥ</i>		
<i>snfrw-nfr</i>	<i>snfrw-nfr</i>	<i>šḥd n ḥsw pr-ḥ,</i>		
G 4940	<i>šsm-nfr I</i>		<i>hrp ḥ</i>	
G 4920	<i>tnti</i>		<i>hrp ḥ</i>	
S 766	<i>ḥnm-ḥtp</i>	<i>imy-r3 st ḥnty-š pr-ḥ, šḥd ḥnty-š pr-ḥ, ḥry pr pr-ḥ</i>		
G 2191	<i>ḥnmw</i>	<i>...pr-ḥ</i>		

<i>hwfw-di.f-ḥ</i>	<i>hwfw-di.f-ḥ</i>	<i>šḥd ḥnty-š pr-ḥ, imy-r3 st nt ḥnty-š pr-ḥ</i>		
<i>hwfw-snb II</i>	<i>hwfw-snb II</i>	<i>šḥd ḥnty-š pr-ḥ, my-r3 ḥnty-š pr-ḥ</i>		
G 4970	<i>nzwt-nfr</i>		<i>imy-r3 ḥ</i>	
G 5550	<i>nfr idw I</i>			<i>imy-r3 ḥnw</i>

In his extensive study of the royal palace during the OK, Goelet classified the titles in *pr-ḥ* into several divisions which were adopted here to subdivide the palace officials in CEE:

1-9-1 Titles connected with the *ḥnty-š pr-ḥ*

Twelve owners in CEE have professions connected to the *ḥnty-š pr-ḥ* including the titles: *ḥnty-š pr-ḥ*, *imy-r3 ḥnty-š pr-ḥ*, *šḥd ḥnty-š pr-ḥ*, *imy-r3 wpt ḥnty-š pr-ḥ* and *imy-r3 st (n) ḥnty(w)-š pr-ḥ*. Their tombs range in size between small to medium (12 to 80 m²).

Titles connected to *ḥnty-š* were an innovation of the late Fifth Dynasty⁷⁵ and are by far the most attested frequently type of *pr-ḥ* compounds. In spite of the frequent mention in the Abusir papyri and other administrative documents, the precise nature of the term *ḥnty-š* is not easy to determine⁷⁶. Stadelmann⁷⁷ argued that in the OK the word *ḥntyw-š* alone denotes a class of people rather than a profession, "the ones who live on the *š*", i.e. the inhabitants of pyramid-towns. A reference to a building used to be commonly added after the word *ḥntyw-š*: either the palace (*pr-ḥ*), as in the present case, or the mortuary temple of a king. The occurrence with other titles elsewhere reinforces further the association between the holders of *ḥnty(w)-š* titles and the upper levels of administration of pyramid cities⁷⁸. The hierarchy of the *ḥnty-š* was established by Stadelmann who followed the system known in other professions dividing title bearers to: *imy-r3 ḥnty(w)-š*, *imy-r3 st ḥnty(w)-š*, *šḥd ḥnty(w)-š*, *imy-ḥt ḥnty(w)-š*. Roth⁷⁹, who studied a cluster of tombs of *ḥnty(w)-š pr-ḥ* to the northeast of G 2000, adopted the same hierarchy system. However, a main obstacle against establishing a distinct hierarchical frame for the *ḥnty-š pr-ḥ* exists, since several officials carried more than one title in this department. *nsw-ḥdw II* for instance held three positions related to the *ḥnty-š pr-ḥ* as : *imy-r3 ḥnty-š pr-ḥ*, *imy-r3 st ḥnty-š pr-ḥ* and *šḥd ḥnty-š pr-ḥ*. The same person is also the only tomb owner of CEE who held the title *imy-r3 wpt pr-ḥ*. The exact meaning of the first

⁷⁵ROTH, *Giza VI*, 40.

⁷⁶ Literally it means the foremost of the lake. The only occurrence of the word *ḥnty-š* outside the context of a title is on the Palermo stone. The element *š* was perhaps connected to the collection and distribution of royal revenue, although its translation remains unclear. WILKINSON, *The Palermo stone*, 164.

⁷⁷R. STADELMANN, *Supplément au BIFAO* 81, 156–57, 157.

⁷⁸GOELET, *Palace*, 569.

⁷⁹ROTH, *Giza VI*, 40.

component of this title, *imy-r3 wpt*, is not quite clear but according to Martin-Pardey⁸⁰ it should be translated as "overseer of the division". While an official bearing the plain *imy-r3 wpt* was responsible for the registration of land and people in his nome, it would not be far from correct to imagine that the *imy-r3 wpt pr-ꜣ* was responsible for the division and distribution of resources in the royal palace.

Three owners in CEE held the title *imy-r3 hnty-š pr-ꜣ*. The duties connected with this office are described in the biographical inscriptions of *wnti*⁸¹ and they seem to involve services rendered to the living king. Six tomb owners in CEE carry the title *šhd hnty-š pr-ꜣ*. Based on several iconographic representations of persons with this title, Goelet⁸² concluded that the *šhd hnty-š pr-ꜣ* was a relatively unimportant, but not wholly insignificant office. Five officials in CEE carry the title *imy-r3 st (n) hnty(w)-š pr-ꜣ*, a less frequent variation of the title *imy-r3 hnty-š pr-ꜣ*. According to Goelet⁸³ the former title might be the higher rank of the later.

1-9-2 Bureaucratic services attached to the *pr-ꜣ*

Two owners in CEE performed scribal functions in the *pr-ꜣ* (G 5610 and G 5040). *B3-špss* (G 5040) was a *zš pr-ꜣ*. The later title occurs in a document from the Abusir Archive⁸⁴ which details tasks that various men were assigned at the Neferirkare temple. The three men titled *zš pr-ꜣ* in that document were followed by the word *dt* which means representative. This may indicate that they did not perform the tasks themselves but rather delegated someone else, an arrangement which suggests that they were primarily employed at another organisation other than the pyramid city, their occupation in the last mentioned being only perhaps on temporary bases.

1-9-3 The secrets and the royal adornment of *pr-ꜣ*

b3-špss (G 5040) carried the title *hry-sšt3 nzwt m pr-ꜣ*. Bearers of this title seem to have been involved in a profession concerned with the king's dress and decoration⁸⁵.

1-9-4 The craftsmen of the *pr-ꜣ*

This category includes the skilled workers who were likely to have been in the king's direct employment. *mn-hbw* (G 5610) was a *šhd iry md3t pr-md3t ntr pr-ꜣ*. The main component of this title, *iry-md3t*, has many translations: he who is connected with letters, archivist, book keeper, préposé au courrier etc. The *iry-md3t pr-ꜣ* was attested in the causeway of Unas as a reference to a

⁸⁰MARTIN-PARDEY, *SAK* 11, 231-251.

⁸¹PM V, 72-74

⁸²GOELET, *Palace*, 579.

⁸³GOELET, *Palace*, 522

⁸⁴POSENER-KRIÉGER and CENIVAL, *Abusir papyri*, pl. LXXXII.

⁸⁵GOELET, *Palace*, 596.

function in general not to a specific person. Piacentini⁸⁶, who documented exhaustively the occurrence of the *iry-md3t* title, concluded that the composite forms of this title, as in the case of *mn-hbw*, were not attributed to officials on a regular basis but were occasionally granted to an official to define a special mission assigned to him.

1-9-5 Various personal attendants of the king and his family in the *pr-ʕ3*

hry pr-ʕ3 attested in two tombs (G 5540, G 5551) is an uncommon title usually translated as major-domo of the palace. Typically, the term major-domo refers to the highest person of a household personal, one who acts on behalf of the owner of a large residence.

1-9-6 Escorts associated with the *pr-ʕ3*

snfrw-nfr was a *shd n hsw pr-ʕ3*, which means he was active in celebrations of the palace including activities as singing and entertainment. The *pr-ʕ3* mentioned here seems to refer clearly to a building rather than to an administration⁸⁷.

1-9-7 Titles connected to the *ʕh*

Six tomb owners in CEE carry the title *hrp ʕh* which was a common title used and confined to the OK period, except for very few cases during the NK. Barta⁸⁸, who studied the spatial and temporal distribution of the holders of this title, traced its increasing frequency during the Fourth Dynasty, its widespread use during the Fifth Dynasty and its sudden decline since the beginning of the Sixth Dynasty. Scenes showing a person working in such a capacity are actually rare. When applied to the tomb owner, the title is mentioned among a large number of titles so that it seems that it was never the main profession of the owner. There seems to be a connection between this title and the personal attendance upon the monarch's person during ceremonies⁸⁹. Barta collected the holders of these titles and noticed that the majority of them (19 in number) were buried at Giza, even during the Fifth Dynasty when the loss of prestige of the Giza cemetery was evident.

1-9-8 Titles connected to *hnw*

Only one tomb owner in CEE carries a title connected with the palace as *hnw*, a fact which agrees with the rare occurrence of the type of titles in general. The earliest examples of the title *imy-r3 hnw*, carried by *nfr Idw I*, were attested in the first half of the Fifth Dynasty, while most examples

⁸⁶PIACENTINI, *RdE* 53, 193.

⁸⁷GOELET, *Palace*, 600

⁸⁸BARTA, *Archive Orientali* 67, 9.

⁸⁹GOELET, *Palace*, 348.

seem to belong to dynasty VI or later. Goelet⁹⁰ found it hard to determine the responsibilities connected with this title, though he traced its association with the viziers.

All together 38 family members and dependants were mentioned in the 25 tombs of the holders of palace administration titles. Only five of them carry in turn titles in the palace. *Mry-ᵑnh* and *z3bi*, the sons of *i3-sn* (G 2196) and *nsw-ḳdw* II respectively, were *ḥnty-š pr-ᵑ3*, a position held by thier fathers as well. In the tomb of *ndmw* (G 2420) were represented a *ḥwfw-dd.f* who was an *imy-r3 wᵑpwt ḥnty-š pr-ᵑ3* and a *skp-ḥtp* who was a *rḥt pr-ᵑ3*. The last mentioned title is not attested elsewhere but it is perhaps a unique variation of the more frequently occurring title *rḥ-nzwt pr-ᵑ3*. The feminine form of the title in this case is also peculiar. *k3-m-ib*, the son of *nzwt-nfr* (G 4970), had a title connected with the ᵑḥ like his father. The position of the father and the son in the ᵑḥ hierarchy is different; while the father is an *imy-r3 ᵑḥ*, the son is a *ḥrp ᵑḥ*.

1-10 Holders of religious titles

It is widely accepted that OK priests belonged generally to two wide groups⁹¹ :

- 1- Bearers of real priest titles who carry out actual temple or funerary duties.
- 2- Those with *Versorgungstitel*⁹², which means that the holder was provided with a regular fixed income by the virtue of his title, but did not practice the ritual duties of the priest in reality. According to Weeks⁹³ the bearing of one or more priestly titles was a requirement for obtaining a certain rations from the royal estates since the later were connected to temples.

The available resources do not often allow modern research to differentiate between the priests of the first and second groups since only few titles have corresponding iconographic evidence to indicate the actual practice of priestly duties; *sm*⁹⁴ and *ḥry-ḥbt*⁹⁵ being examples of such. In addition to that, many high and middle class officials carry priestly titles along with other administrative positions and it is not possible to determine whether priests were promoted out of temple service into administration or vice versa.

Tomb number	owner	<i>ḥm-ntr</i>	<i>wᵑb</i>	<i>ḥm-k3</i>	<i>ḥry-ḥp</i>
G 2366	<i>nmsti</i>	<i>ḥm-ntr nzwt</i>	<i>wᵑb nzwt</i>	<i>imy-ḥt ḥm-k3</i>	
G 5562	<i>s-n-3ḥt</i>			<i>ḥm-k3, imy-r3 wpt ḥm-</i>	

⁹⁰GOELET, *Palace*, 117.

⁹¹HELCK, LÄ IV, 1085.

⁹²HELCK, *Beamtentitel*, 120 ff.

⁹³WEEKS., *Chronique d'Égypte* LVIII, 17.

⁹⁴LEHMAN, *Der Serdab*, 138.

⁹⁵HELCK, LÄ IV, 1087.

	<i>s-n-ḥwt-ḥr</i>			<i>k3</i>	
G 2396	anonymous			<i>ḥm-k3</i>	
G 5530	<i>mmi</i>	<i>ḥm-ntr ḥwfw</i>			
G 2364	<i>sn̄dm-ib</i>			<i>ḥm-k3</i>	
G 2156 b	<i>ir-n-r^c</i>	<i>šḥd ḥm-ntr</i>	<i>w^cb nzwt</i>	<i>imy-r3 ḥm-k3</i>	
S 939-955	<i>n-mt.f</i>			<i>imy-r3 ḥm-k3</i>	
<i>ḥnit</i>	<i>ḥnit</i>	<i>ḥmt-ntr ḥwt ḥr</i>			
<i>nsw-ḳdw II</i>	<i>nsw-ḳdw II</i>	<i>ḥm-ntr ḥwfw</i>	<i>w^cb nzwt</i>		
S 660-661	<i>šḥm-^cnḥ-ptḥ</i>			<i>ḥm-k3</i>	
G 5032	<i>rdi-ns</i>		<i>w^cb nzwt</i>		
G 5540	<i>ḥ3m-k3</i>	<i>ḥm-ntr mdw ḥr, ḥm-ntr ḥwfw, ḥm- ntr ḥrwy nbw</i>			
<i>ḥwfw-snb II</i>	<i>ḥwfw-snb I</i>	<i>ḥm-ntr ḥwfw, ḥm- ntr ḥr mdw</i>			
G 4941	<i>ptḥ-iw.f-ni</i>		<i>w^cb 200</i>		
G 2197	<i>pn-mrw</i>	<i>ḥm-ntr mn-k3w-r^c, imy-r3 ḥmw-k3</i>	<i>w^cb nzwt</i>		
G 2175	<i>ndw</i>		<i>w^cb nzwt</i>		
G 4911	<i>^cnḥ-tf</i>	<i>ḥm-ntr ḥwfw</i>	<i>w^cb nzwt</i>		
G 2352	<i>ḥ3gi</i>	<i>ḥm-ntr ḥrwy nbw</i>	<i>w^cb</i>		
G 2353	<i>ḥrw-nfr</i>	<i>ḥm-ntr ḥwfw</i>			
G 2184	<i>3ḥt-mr-nzwt</i>		<i>W^cb nzwt</i>		
G 5520	<i>s^cnḥ-ptḥ</i>	<i>ḥm-ntr m3^ct</i>			
G 2418	anonymous		<i>w^cb</i>	<i>šḥd ḥm-k3 3ḥt-ḥwfw</i>	
G 2172	<i>ip</i>		<i>w^cb nzwt</i>		
G 2420	<i>ndmw</i>	<i>ḥm-ntr ḥr mddw, ḥm-ntr ḥr-nb-ḥr</i>	<i>šḥd w^cb nzwt</i>		
G 2196	<i>i3-sn</i>	<i>ḥm-ntr ḥwfw</i>	<i>šḥd w^cbw</i>		
G 5610	<i>mn-ḥbw</i>	<i>ḥm-ntr ḥwfw, ḥm- ntr mdw-ḥr</i>			
G 2381	<i>mry-r^c-mry- ptḥ-^cnḥ nḥbw</i>				<i>ḥry-ḥb, ḥr-ḥ ḥry-tp</i>
<i>ḥwfw-snb I</i>	<i>ḥwfw-snb I</i>	<i>ḥm-ntr,,,ḥm-ntr mdd-r-nbty</i>			
G 2423	<i>mḥw</i>	<i>ḥm-ntr m3^ct</i>			
G 5380	<i>ḥtpy</i>				<i>ḥry-ḥb</i>
G 5560	<i>k3-ḥr-ptḥ ft-k3</i>	<i>ḥm-ntr m3^ct</i>			
G 5470, LG	<i>r^c-wr II</i>	<i>ḥm-ntr m3^ct</i>			

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G 5210	<i>hm-tn</i>	<i>hm-ntr hwwf</i>	<i>w^cb nzwt</i>	<i>imy-r3 hmw-k3</i>	
G 4970	<i>nzwt-nfr</i>	<i>hm-ntr h^c.f-r^c, hm-ntr twt h^c.f-r^c</i>	<i>imy-r3 w^cbw</i>		
G 5150	<i>sst-htp hti</i>	<i>hm-ntr hnt-hni, hm-ntr b3 nbt, hm-ntr hr sth, hm-ntr b3stt, hm-ntr smst</i>			<i>hry-hb</i>
G 4940	<i>s^sm-nfr I</i>	<i>hm-ntr hkt, hm-ntr inpw</i>			
G 5170	<i>s^sm-nfr III</i>				
G 2370	<i>sndm-ib inti</i>				<i>hry-hb</i>
G 5230	<i>B3-b3.f</i>	<i>hm-ntr wn-rw hnti hmi, hm-ntr km3^c, hm-ntr dhwti</i>			<i>hry-hb hry-tp</i>
G 5110	<i>dw3-n-r^c</i>	<i>hm-ntr hr inpw hntyw pr smswt</i>			<i>hry-hb hry-tp</i>
<i>tn3</i>	<i>tn3</i>	<i>hm-ntr hwt hr</i>			
G 2337-X	<i>d3ti</i>			<i>hm-k3</i>	
<i>s3t-htp II</i>	<i>s3t-htp II</i>	<i>hm-ntr</i>			
G 2338 X	<i>tnni</i>			<i>shd hm-k3</i>	
G 5554	<i>hy</i>			<i>imy-ht hm-k3</i>	
G 5040	<i>k3-m-kd</i>		<i>w^cb nzwt</i>		
G 2197	<i>pn-mrw</i>	<i>hm-ntr mn-k3w-r^c</i>	<i>w^cb nzwt</i>	<i>imy-r3 hmw-k3</i>	
G 5130	<i>titi</i>	<i>hm-ntr hwwf</i>	<i>w^cb nzwt</i>		

48 tombs owners in CEE have religious titles of the first and second divisions (map 5.10). Their tombs range between 8 and 1304 m² in area and their positions on the seriation graph 3.2 are between 12 and 241. Religious titles in CEE are of three main types: *hm-ntr*, *w^cb nzwt* and *hm-k3*. With regard to the bearers of title *hm-ntr* in CEE, they served several kings and deities, chief among the former is king Khufu. It has been noticed elsewhere that the cult personnel employed in the maintenance of the funerary cult of Khufu, which was initiated at some point during his reign and continued into the reign of Pepi II, concentrate in the WCE⁹⁶.

Religious titles of tomb service passed from father to son in at least two families in CEE. *ir-n-3ht iri* (G 2391) was active in the management of the funerary cult of *sndm-ib mhi* (G 2378). Graph 4.1 has demonstrated in another context that this function was passed to his sons *sndm-ib* and *nfr-mhi* and *hnm-inti*. *hm-tn-nds* (G 5210) obviously carried after his father *hm-tn* the funerary service of the *mr.s-nh* family since he carried the titles *imy-r3 pr*, *imy-r3 hmw-k3*.

⁹⁶SHIRAI, "Funerary cults", 156, fig. 6.

1-11 Holders of titles in the pyramid complex

From textual sources, it is clear that the structure of pyramid priesthoods during the OK was not uniform at all pyramids and changed with the passage of time⁹⁷. Since the Fifth Dynasty the organisation of service in pyramid complexes and in sun temples came to be operated by the phyle system which included a hierarchy for the priests *w^cb*, *ḥm-ntr* and *ḥm-k3*. Also involved in the service of the pyramid complexes were the *ḥntyw-š*⁹⁸.

Tomb number	owner	Titles
G 5560	<i>k3-ḥr-ptḥ ftk.ti</i>	<i>imy-r3 niwt m3wt nt nfr-issi, šḥd 3ḥt-ḥwfw,</i>
G 4941	<i>pḥ-iw-fni</i>	<i>ḥnty-š mn-nfr ppy</i>
G 2381	<i>nḥbw</i>	<i>imy-r3 ḥnty-š mn-nfr-mry-r^c ppy, imy-r3 wpt nzwt mn-nfr-mry-r^c</i>
G 2374	<i>ḥnm-inti</i>	<i>šḥd ḥmw-ntr dd-sw-tti.</i>

Four owners in CEE were employed in the service of pyramids which included those of kings Khufu, Isesi, Teti and Pepy I (map 5.11). The area of the four tombs range between 46 and 160 m² and their positions on the seriation graph 3.2 are between 52 and 241. *k3-ḥr-ptḥ ftk.ti* (G 5560) carried the unique title *imy-r3 niwt m3wt nt nfr-issi*. The new settlements forming a part of the last mentioned title are a subject of much debate. Maspero believed that they are the new formed lands as a result of the shrinkage of the Nile in 15th 16th and 17th nomes of Upper Egypt while both Breasted and De Rougé suggested that these new settlements are a new administrative division in Middle Egypt⁹⁹. Pirenne¹⁰⁰ on the other hand believed that such settlements, situated directly to the south of Memphis, appeared in the Third or Fourth Dynasties but it was Userkaf who introduced the term new settlements to refer to them.

1-12 Holders of royal titles

By the expression royal titles we refer to the titles *mwt nzwt*, *ḥmt nzwt*, *z3 nzwt* and *z3t nzwt*, while being aware of the fact that the last two titles alone do not necessary indicate a royal fatherhood. To determine the bearers of *z3 nzwt* and *z3t nzwt* who had real biological connections with the king, several criterion were set by different scholars. Junker¹⁰¹ for instance took the phrase *n it.f* when attached to one or more titles of the official as the only secure criteria to determine a king's son.

⁹⁷BAER, *Rank and title*, 248.

⁹⁸HELCK, LÄ IV, 1086.

⁹⁹ 110 السعدي, حكام الأقاليم ,

¹⁰⁰PIRENNE, *Institutiones*, 156.

¹⁰¹JUNKER, *Giza II* 33-4.

Schmitz¹⁰² on the other hand added three other criteria to judge this matter :

1- The ideal circumstance when the name of the king is stated directly as the father, a rare occurring case since the name of the king as a father was only exceptionally expressed.

2- - The representation of the king with his son in a temple. While no example of this case is known from the Fourth Dynasty, because the temples are destroyed, several examples are attested from the Fifth and Sixth Dynasties.

3- A mother who carries the titles of a queen, a condition which applies to a handful of princes and princesses of the OK.

On the other hand, Schmitz noticed the frequent occurrence of certain titles with persons with no recognizable royal genealogy. These titles are: *mdḥ sš nzwt*, *sm ḥrp šndit*, *imy-r3 s3w šmꜥw*. She thus associated those three titles with the titular princes, who acquired the royal title as a sign of a certain rank.

Tomb number	Owner	title
G 5110	<i>dw3-n-rꜥ</i>	<i>z3 nzwt n ḥt.f</i>
G 5230	<i>B3-b3.f</i>	<i>z3 nzwt, z3 nzwt n ḥt.f, smr-wꜥty n it.f</i>
G 5150	<i>šst-ḥtp ḥti</i>	<i>z3 nzwt n ḥt.f, z3 nzwt n ḥt.f smsw</i>
G 5170	<i>šsm-nfr III</i>	<i>z3 nzwt n ḥt.f</i>

There are four tomb owners in CEE who bore royal titles, strikingly all of whom are viziers (map 5.12). Their tombs range in area between 344 and 1304 m² and their positions on the seriation graph 3.2 are early being between 14 and 29. The title *z3 nzwt n ḥt.f*, carried by the four tomb owners, appeared since the beginning of the Fourth Dynasty. According to Schmitz¹⁰³, its earliest holders were true sons of the king who might have used the additional phrase *n ḥt.f* to stress the royal parentage only. However, many later bearers of this title since the Fifth Dynasty do not have any of the above mentioned criteria to assert a biological connection to the king and the title seems thus to have lost its original meaning.

Applying the criterion set by Junker in determining the true king's sons, *b3-b3.f* (G 5230) would perhaps be the best candidate for a born prince since he attached the phrase *n it.f* to one of his titles. The only obstacle against this interpretation is the remark made by Resiner that *b3-b3.f* is the son of *dw3-n-rꜥ*¹⁰⁴ (G 5110), a suggestion which has other pieces of evidence¹⁰⁵.

As mentioned above, a statue discovered in the serdab of G 5150 was taken by many scholars as an

¹⁰² SCHMITZ, *Königssohn*, 46 ff.

¹⁰³ SCHMITZ, *Königssohn*, 65 ff.

¹⁰⁴ For a discussion about the parentage of *dw3-n-rꜥ* see supra p. 117.

¹⁰⁵ See infra p. 213.

indication of the promotion of *sšt-ḥtp ḥti* to the vizierate. On the same statue *sšt-ḥtp ḥti* carries the title *z3 nzw t n ḥt.f smsw* in addition to the *t3y ty z3b t3ty*. Schmitz correlated between *imy-r3 k3t nzw t* and *z3 nzw t n ḥt.f*, inscribed on the walls of G 5150, on one hand, and the *t3y ty z3b t3ty* and *z3 nzw t n ḥt.f smsw*, inscribed on the serdab statue, on the other hand. She concluded that the addition of *smsw* to the royal title was contemporary to the promotion of *sšt-ḥtp ḥti* from *imy-r3 k3t nbt nzw t* to a *t3y ty z3b t3ty*. A man called *ḥti* bearing the titles *ḥ3ty-ꜥ* and *ḥry-ḥb* was depicted in the funerary temple of Sahure. Whether this man is the same as *sšt-ḥtp ḥti* is uncertain, but the rarity of the name and the probable date of the two men led Kanawati¹⁰⁶ to suggest such an identification. At Sahure's temple the man named *ḥti* has several notable representations in a position either immediately behind, or even once in front of Sahure's own successor, Neferirkare. While many other men in these scenes are described as *z3 nzw t*, *ḥti* is not, and accordingly he is unlikely to be the son of Sahure. Kanawati nevertheless saw this depiction among royal sons and the heir apparent suggestive for a royal ancestry.

sšm-nfr III (G 5170) is a classical example which is usually used to illustrate the rewarding of *z3 nzw t n ḥt.f* as a rank title since his non-royal parentage is well attested¹⁰⁷.

1-13 Holders of honorific titles

The rank title division contains those honorific titles which were granted to their bearers for the purpose of distinction but are not themselves connected to a function or a duty. This category must have included a large number of titles. The most distinctive honorific titles during the Old Kingdom were taken in the current study to represent this category: *iry-pꜥt*, *smr wꜥty*, *rh-nzw t* and *špss nzw t*. According to Helck¹⁰⁸, a rank system was developed in the royal palace since the beginning of the Fourth Dynasty to distinguish those who play some role or another in the royal court, yet have no effective function in the state. In this manner the old princely title *iry-pꜥt* was granted to the non-princes and topped a rank hierarchy whose lowest degree was represented by the title *smr wꜥty*. Such titles were however later, perhaps since the Fifth Dynasty, also granted to those appointed to the top of the state bureaucracy to put them on equal footing with their subordinates who held the same type of honorific titles.

A well known example of the honorific title category is *rh-nzw t*, a title so common that it is occasionally considered rather an epithet¹⁰⁹. It appeared first since the Third Dynasty¹¹⁰ and though well attested during the OK and MK, there remains some doubt about its earlier use and

¹⁰⁶KANAWATI, *ACE reports* 18, 17.

¹⁰⁷See supra, p. 144 ff.

¹⁰⁸HELCK, *Beamtentitel*, 111.

¹⁰⁹Murray and Ward title index did not include this title because they considered it an epithet.

¹¹⁰GRAJETZKI, *Die höchsten Beamten*, 225.

meaning. According to Fischer¹¹¹, it clearly meant: one who is known to the king in the later OK. Helck¹¹² noticed that, with few exceptions, the holders of *rh-nzwt* during the OK were not of a high social status.

The title *šps nzwt* was claimed by a large number of officials in the Sixth Dynasty. It apparently made its first appearance as a formal designation in the reign of Teti and at the end of the same dynasty or very soon after it fell again into disuse¹¹³. As the below table demonstrates, 32 tomb owners in CEE carry one or more of those honorific titles (map 5.13). The variations of the tomb area of those owners are great (between 4 and 1304 m²) as is their distribution on the seriation graph 3.2 (between 12 to 243).

Tomb number	owner	<i>rh-nzwt</i>	<i>smr</i> or <i>smr w^cty</i>	<i>iry-p^ct</i>	<i>šps nzwt</i>
G 2184	<i>šht-mr-nzwt</i>	•			
G 2332	Anonymous		•		
G 5110	<i>dw3-n-r^c</i>		•	•	
G 4920	<i>tni</i>		•		
G 5340	<i>k3-s-wd3</i>		•		
G 5150	<i>sšt-htp hti</i>		•	•	
G 5170	<i>sšm-nfr III</i>		•		
G 4940	<i>sšm-nfr I</i>	•			
G 2378	<i>sndm-ib mhi</i>		•	•	
G 2370	<i>sndm-ib inti</i>		•	•	
<i>snfrw-nfr</i>	<i>snfrw-nfr</i>	•			
G 2386 C 2	<i>z3bw pth-ibbi</i>		•		
<i>hnti-k3.s</i>	<i>hnti-k3w.s</i>	•			
G 2374	<i>hnm-inti</i>		•	•	
<i>hnit</i>	<i>hnit</i>	•			
G 5210	<i>hm-tn</i>	•			
G 2350	<i>htp-n-pti</i>	•			
G 5380	<i>htpy</i>		•		
G 5032	<i>rdi-ns</i>	•			
G 5270	<i>r^c-wr I</i>	•			
G 4970	<i>nzwt-nfr</i>	•			
G 2366	<i>ni-msti</i>	•			

¹¹¹FISHER, *El Saff*, 24 (13).

¹¹²HELCK, *Beamtentitel*, 27-8.

¹¹³FISCHER, *ZÄS* 86, 26 ff.

S 576	<i>nfr II</i>	•			
G 2421	<i>mn-nfr</i>	•			
G 2381	<i>nḥbw</i>	•			•
G 4941	<i>pth-ḳw.fni</i>	•			
G 5280	<i>ph-n-ptḥ</i>	•			
G 2197	<i>pn-mrw</i>	•			
G 5230	<i>b3-b3.f</i>		•		
G 5020	<i>ii-m-ḥtp</i>	•			
G 2196	<i>i3-sn</i>	•			
iri-n-Axti	<i>iri-n-3ḥti</i>				•

2- Correspondence analysis for the co-occurrence of titles

The interpretation of the constant occurrence of particular titles in the same context is a frequently encountered research topic which has been examined by many scholars. The most exclusive study was carried out by Baer¹¹⁴ who attempted to show the relative ranking status of titles at different periods of the OK using the sequence of titles which appeared in tombs. Great efforts were made often as well in investigating the combined occurrence of several title groups with a certain title. Strudwick for instance was concerned with the viziers of the OK, Roth with the *ḥnty-š pr-ʿ3*, Barta with the *hrp ʿh*, Piacentini with the *ḥk3 ḥwt*¹¹⁵ and Krejci with the *imy-r3 k3t*¹¹⁶.

In the present study the co-occurrence of the 13 title categories was investigated in order to identify those tomb owners with similar title clustering. For this aim the near neighbour clustering (NNC) method provided by the Winasp software was utilized. Winasp functions of hierarchical clustering use the shared near neighbour algorithm developed by Jarvis and Patrick¹¹⁷. This method seeks to build a hierarchy of clusters at different levels depending on the strength of association of their components. The outcome of the algorithm is demonstrated in the form of dendrograms.

Dendrogram 5.1 has arranged the tombs according to the clustering of the titles of their owners. The degree of similarity of the entered 54 tombs¹¹⁸ was thus symbolized by 7 levels whose order expresses the bond between the titles of tomb owners in a descending manner; the strongest the bond, the higher the order. The three first levels are explained below:

¹¹⁴BAER, Klaus, *Rank and Title in the Old Kingdom. The Structure of the Egyptian Administration in the Fifth and Sixth Dynasties*, [Chicago, Ill.]. The University of Chicago Press, 1960.

¹¹⁵PIACENTINI, *ḥk3w ḥwt*, 236 ff.

¹¹⁶KREJCI, 'Overseers of Works', 67-75.

¹¹⁷JARVIS and PATRICK, "Clustering Using a Similarity Measure", 1025-10.

¹¹⁸This is the number of tombs in which more than one title category occur.

Level 7: Includes 9 groups of tombs:

- 1- Seven tombs whose owners carried honorific and religious titles (G 2175, G 2197, G 2338 X, G 2352, G 2366, G 2380, *hnit*)
- 2- Four tombs whose owners carried honorific, religious and palace titles (G 2184, G 2196, G 5540, G 4941).
- 3- Two tombs whose owners carried honorific, religious, palace and legal titles (G 4970, G 5040)
- 4- Two tombs whose owners carried honorific and palace titles (G 2430, G 4920).
- 5- Four tombs whose owners carried religious and scribal titles (G 2337 X, G 2364, G 5130, S 660-661)
- 6- Three tombs whose owners carried honorific and scribal titles (G 2332, G 5270, *idw* II).
- 7- Two tombs whose owners carried legal and scribal titles (*k3-nfr* II, *st-k3*)
- 8- Two tombs whose owners carried legal and religious titles (G 2423, G 5470)
- 9- Five tombs whose owners carried palace and religious titles (G 2420, G 5530, G 5610, *nsw-kdw* II, *hwfw-snb* II)

Level 6: Includes four groups of tombs:

- 1- The unification of the groups 2 and 3 of level 7 .
- 2- Three tombs G 2383, *nh-wd3-iti*, G 5330.
- 3- Three tombs G 2370, G 2374, G 5550.
- 4- Three tombs G 2378, G 2381 A, *z3bw-ptḥ ibbi*.

Level 5: Includes three groups of tombs:

- 1- The unification of group 4 of level 7 with tomb G 5340.
- 2- The unification of group 5 of level 7 with tombs G 4940, G 5560, G 5520.
- 3- The unification of group 3 and 4 of level 6 with tombs G 5150 and G 5170

Dendrogram 5.2 on the other hand demonstrates the relation between the 13 titles categories depending on their co-occurrence in the same tombs. The strongest association, expressed by level 4, is between two groups of title categories:

- 1- Palace + expedition titles.
- 2- *pr-ḥd* + *šnwt* + labour titles.

The second level of association expressed by level 3 shows two large divisions of titles

- 1- Honorific + palace+ expedition+ legal+ scribal titles.

2- *šmw*+ labour + *vizier*+ construction titles.

This division does not imply that the above two groups are completely independent but it indicates a stronger association between the titles belonging to each group in comparison to the titles belonging to the other group. In other words, owners tend to carry either the first or second cluster of titles, but it occurs occasionally too that an owner carries at least one title of the other group. Both groups demonstrate a wide range of tomb areas, but the average tomb size of the second group is by far much larger than the first (343,9 m² versus 138,5 m²).

Although the correlation between the tomb size and the rank of its owner was variable along the period since the Fourth Dynasty until the Sixth¹¹⁹, textual evidence exists to indicate that tomb-size was in general interpreted as a scale of achievement of its owner¹²⁰. In the case of the current study, and as noticed so far, the ranges between the areas of tombs of the 13 occupation categories were so great, that no conclusion concerning the relation between titles and tomb size could be derived. The homogeneity between tomb sizes in the groups offered by Dendrogram 5.1 was compared to the homogeneity of tomb sizes in the 13 title categories using the standard deviation as a measure for the variability in each case. A low value of the standard deviation indicates that the data components tend to be very close to the mean, whereas a high standard deviation value indicates that the data are spread over a large range of values.

Graph 5.1 demonstrates a trend in the values of the standard deviation in which the tombs belonging to level 7 in Dendrogram 5.1 exhibit the least variability in the terms of their sizes, followed by tombs of level 6 and 5 of the same Dendrogram successively. This result suggests that the more the titles of the owners were similar, the higher the expectation would be of those owners to possessing tombs of a similar sizes. The similarity of titles was not however expressed by a single title (as in the case of the 13 title categories) but was rather a flexible convention which included several combinations of different title categories. This fact would perhaps reinforce the common belief that the land of the cemetery was subject to a degree of control based on the owner's rank. However, no matter how we experiment with variable classifications and combination of titles, we will probably only come close to the ancient Egyptian comprehension of the occupational requirements to occupy more or less space in the cemetery but we might never understand it completely.

While the above discussion gives some indications for a degree of control concerning the tomb size, no spatial pattern of occupation of cemetery's land could be traced. Several statistical methods were

¹¹⁹KANAWATI, *Administration*, 78.

¹²⁰ALEXANIAN, *OKAA* 2006, 5.

performed to trace any concentration concerning the spatial distribution of tombs of the 13 titles categories and of the groups of tombs classified by Dendrogram 5.1. In all cases the results obtained were either dispersed (in most cases) or random (in few cases). It seems thus that the deciding factor in choosing the tomb location was the available space in the cemetery, the distribution of tombs in CEE being more or less a reflection of chronology.

3- Time line of the title categories

The chronological distribution of the title holders was demonstrated by representing the upper and lower ranges of the tombs of the 13 title categories, on a line graph (graph 5.2). In its final form the graph resembled a time line which shows the beginning, duration and end of appearance of each title category in CEE. The arrangement of titles according to their appearance is thus: honorific, palace, construction, scribes, religious, viziers, legal, royal expeditions, pyramid, labour, *pr-ḥd* and finally *šnwt* titles. Not surprisingly, and due to the wide spread of the honorific titles, the earliest appearance and the longest time line belong to this title category. The categories of palace, construction, scribes, religious and viziers are closely associated in terms of their appearance and duration with little variations concerning their disappearance. The same relation can also be noticed between the labour, *pr-ḥd* and *šnwt* titles. Those three categories were the last which appeared in the cemetery and their duration was rather brief.

4- Quantitative evaluation of titles

For the purpose of the comparison of the administrative ranks of tomb owners, their titles were ranked in a scale topped by the vizier as shown in the below table. Each title was given a score according to its range of authority and relative importance as explained by the above discussion of the 13 title categories. Each tomb owner was assigned then a value which is the sum of the scores of his several titles. These scores will be used in further discussions concerning the social status and economic capacity of tomb owners¹²¹.

Title	score
Title of vizier	30
Legal titles	10
Scribal titles	10
Expedition titles	10
Construction titles	20
Labour titles	10

¹²¹ See infra p. 226ff.

<i>šnwt</i> titles	10
<i>pr-hd</i> titles	10
Palace titles	10
Pyramid complex titles	10
Royal titles	20
Honorific titles	5
Religious titles	5
Other titles	5

5- Family careers

In spite of the common notion concerning the hereditary nature of ancient Egyptian titles, studies that are devoted to this subject are relatively rare¹²². The main sources which provide information on careers of several members of the same family are the tomb relief representations. Such traditional scenes show only what the tomb owners wanted to leave behind them: in most cases, and not surprisingly, an idealised family image. Not only do these representations lack the factor of age in the representations of descendants of the tomb owner, who are often represented as children regardless of their age at the time of the execution of the decoration, but they also tend to attribute minor titles to the family members of the tomb owner. Our attempts to research many aspects of family careers would thus face several limitations except in the cases where tombs of several family members can be located. CEE offer this unique opportunity since three family lines could be well traced. To investigate the hereditary nature of titles within these families, we should search for a consistent pattern which might indicate that one or more of the administrative occupations held by the elder members of the family were passed to their descendants.

<i>sndm-ib</i> family								
Period of vizierate ¹²³	owner-tomb	construction	viziers	scribal	religious	<i>šnwtj</i>	honorific	labour
Later Isesi	<i>sndm-ib inti</i> (G 2370)	•	•	•	•	•	•	•
Early Unas	<i>sndm-ib mḥi</i> (G 2378)	•	•	•		•	•	•
End Fifth dynasty	<i>hnm-inti</i> (G 2374)	•	•	•		•	•	•
	<i>k3i-hr-ptḥ ftk-ti</i> (G 5560)			•	•	•		

¹²² I could only find two such studies: GALVIN, Marianne, The Hereditary Status of the Titles of the Cult of Hathor, *Journal of Egyptian Archaeology* 70 (1984), 42-49; BIERBRIER, M. L., The Late New Kingdom in Egypt (c. 1300-664 B.C.). A Genealogical and Chronological Investigation. With a Foreword by K. A. Kitchen, Liverpool Monographs in Archaeology and Oriental Studies Published for the School of Archaeology and Oriental Studies, The University of Liverpool, 1975.

¹²³ After list given by STRUDWICK, *Administration*, table 28, 303-4.

	<i>ny-^ϵnh-mnw</i> ¹²⁴				•			
	<i>sndm-ib</i> ¹²⁵						•	•
	<i>nhbw</i> (G2381)	•			•	•	•	•
	<i>mr-pt^h-^ϵnh-ppi</i> ¹²⁶ (G2385?)				•			
	<i>tm³t</i> ¹²⁷						•	•
Mid Pepy II	<i>z3bw-pt^h ibbi</i> ¹²⁸ (G2381 C, G 2386 C2)	•	•		•		•	•
Mid Pepy II	<i>impy</i> (G2381 A, G 2386 C1)	•	•					•
End OK	<i>wr-k3w-b3 ikw</i> (G 2383)		•				•	
	<i>ikw</i> ¹²⁹			•			•	

As already mentioned in another context, no sources exist to give information concerning the origin of the *sndm-ib* family and thus it is not possible to determine whether *sndm-ib inti* inherited one or more of his offices from his predecessors. It is however probable that some of *inti*'s minor titles, namely the *imy-r3 pr-^ϵh3* and *imy.r3 pr nzwt mswt*, were passed to him from his father, a *sndm-ib* suggested by Brovarski¹³⁰.

For the following generations of the family, available sources indicate clearly that the occupation of several fields of administration was common to members of this family. Six men of the *sndm-ib* family served as viziers under Kings Isesi, Unas and Pepi II. Though they all occupied the position on the top of administration of the state, the six viziers showed divergent involvement in the other principal administrative departments. The most authoritative among them was *sndm-ib inti*, the founder of the family complex, and his younger son *hnm-inti*, both holding positions in seven of the most prominent administrations of the country. As demonstrated in the above table, the function which occurred most frequently during the four generations of the family is the overseer of all works of the king. Indeed the direction of the of public works, being headed by six family members, seems to have been the focal point in the career of this family. We know from the biography of *inti* that he undertook a number of building projects for King Isesi. Apparently early on in *inti*'s years of service under that sovereign, he erected a Hathor chapel for the king on the

¹²⁴ Son of *inti*, represented in G 2370

¹²⁵ Son of *mhi*, represented in G 2378.

¹²⁶ Brother of *nhbw*, represented in G 2381.

¹²⁷ Son of *nhbw*, represented in G 2381.

¹²⁸ Son of *nhbw*, represented in G 2381.

¹²⁹ Son of *wr-k3w-b3 ikw* represented in G 2383

¹³⁰ BROVARSKI, *Giza* VII,24.

grounds of the palace. For this, *inti* evidently received royal approbation, being cleansed, anointed, and decorated in the presence of his sovereign. The culmination of his career, however, came towards the end of Isesi's reign, when *inti* laid out and presumably oversaw the construction of the precinct for the jubilee of the king since two of the three letters from Isesi are devoted to the subject of the construction of this precinct.

Worthy of attention is the gap in the important offices held by the *sndm-ib* family during the long period between the end of the Fifth dynasty to the middle reign of Pepi II. This gap might be a result of the lack in our knowledge concerning the connection between the second and the third generation of the family¹³¹. In any case we have no evidence to show that the next known member of this family, *nḥbw*, held the high position of the vizier. There are only enough sources to indicate that he was a director of the work of the king. *nḥbw*'s biography¹³², scattered on several blocks, details his construction work missions in Heliopolis and Qus where he partially acted as an assistant to an unnamed older brother during the reign of Pepi I. *nḥbw* also led an expedition to Wadi Hamamat which he commemorated by an inscription there. The difference between *nḥbw*'s titles in each text suggests that his contribution to the building works took place before his promotion to *imy-r3 k3t nzwt* while he led the Wadi Hamamat expedition after such a promotion¹³³. *Nḥbw*'s activity in the last named mission may suggest that the office of overseer of works included the responsibility for the expeditions and the works of construction, the feature common to both fields being perhaps the organization of labour and of work. According to Krejci¹³⁴, who studied 98 holders of the title *imy-r3 k3t*, found *nḥbw*'s case however extraordinary and remarkable since titles of other overseers of work indicated that they stayed at the construction site or at the residence and did not take part in the material gathering expeditions. Though *nḥbw* did not inherit the office of a vizier, Brovarski¹³⁵ found evidence from the destroyed serdabs of his sons *impy* and *ibbi* that they both held the high office during the long reign of Pepi II. When the two important positions in the vizierate and direction of works were combined again by members of this the family, *impy* and *ibbi*, they were no more accompanied by the administration of *pr-ḥd* or *šnwty*. Actually the involvement of members of this family in different administration fields retreated gradually. The last known member for us, *wr-k3w-b3 ikw* (G 2383), though still a vizier, was no more active in the focal domain of this family's career: the administration of works.

As much as this family dominated the main areas of administration, they were absent from several other title domains. No male family member for instance held any royal title, creating no illusions

¹³¹ See genealogy of the *sndm-ib* family, supra p. 149ff.

¹³² STRUDWICK, *Texts*, 265-8 (198).

¹³³ STRUDWICK, *Administration*, 243.

¹³⁴ KREJCI, "Overseers of Works", 74.

¹³⁵ BROVARSKI, "The Sendjemib Complex", 115-121

about a royal ancestry for *sndm-ib inti*. Titles of two female members of the family leave us however to consider a marriage relationships to the reigning kings. *h3t-k3w* wife of *nḥbw* (G2381) and *ḥnti-k3w.s* wife of *sndm-ib mḥi* (G 2378) carried the titles *z3t nzwt* and *z3t nzwt n ḥt.f* respectively. The two women belong to the category of female bearers of *z3t nzwt* for whom no enough criteria exist to determine a real royal parentage¹³⁶. Such a possibility should not however be excluded since cases of king's daughters who got married to officials during the OK do occur¹³⁷. The association with the royal palace, in both terms of *ḥ* and *pr-ḥ*, is also absent from the functions of the *sndm-ib* family members.

<i>sšm-nfr</i> family														
Period of vizierate	owner-tomb	construction	viziers	scribal	religious	<i>šnwtj</i>	honorific	labour	<i>pr-ḥd</i>	legal	pyramid	palace	expedition	royal
	<i>sšm-nfr</i> I (G 4940)	•		•	•		•			•		•		
	<i>Rḥ-wr</i> I (G5270)			•			•							
	<i>sšm-nfr</i> ¹³⁸									•				
	<i>ph-n-ptḥ</i> (G 5280)			•			•							
	<i>sšm-nfr</i> II (G 5080)	•		•										
	<i>ph-n-ptḥ</i> ¹³⁹			•										
	<i>rḥ-nfr-ḥtp</i> ¹⁴⁰			•										
Isesi	<i>sšm-nfr</i> III (G 5170)		•	•	•		•			•				•
	<i>rḥ-wr</i> II (G 5470)				•					•				
	<i>s3tw</i> (G 5480)													
	<i>nfr-sšm-ptḥ</i> ¹⁴¹			•										
	<i>sšm-nfr</i> IV (LG 53)						•							

¹³⁶SCHMITZ, *Königsohn*, 123.

¹³⁷For example *K3-gm-ni* was married to *nwb-ḥt-nbti sšsšt* who is believed to be the daughter of king Teti : BAUD, *Famille royale*, 486 (111).

¹³⁸Son of *rḥ-wr* I

¹³⁹ Son of *sšm-nfr* II

¹⁴⁰ Son of *sšm-nfr* II

¹⁴¹ Son of *sšm-nfr* III

	<i>ḥtp-ḥr.s</i> (LG 54)													
	<i>pth-ḥtp</i>				•								•	
	<i>sšm-nfrt tti</i>													

Members of the *sšm-nfr* family show less concentration in occupying similar fields of administration. In this case the most common field along the successive generations of the family was the scribal administration in which eight family members were active, followed by the judicial functions which are attested for four family members. Again the two characteristic fields of administration for this family disappear with the passing of time and beginning from the fourth generation no member of the family held scribal or legal positions.

<i>k3-n-nzwt</i> family				
owner-tomb	religious	honorific	royal	palace
<i>k3-n-nzwt</i> I (G 2155)	•	•	•	
<i>ḥr-wr</i> ¹⁴²				
<i>k3-n-nzwt</i> II (G 2156)	•			•
<i>k3-n-nzwt</i> III (G2156a)		•		
<i>ir-n-r^c</i> (G2156b)	•			
<i>ḥnh-m-r^c</i> (G2156c)				

The above table demonstrates clearly the non-involvement of the members of *k3-n-nzwt* family in the main administration departments of the state. *k3-n-nzwt* I held in addition to the royal titles, nothing more than rank titles like: *ḥrp-ḥ*, *smr-w^cty*, *nḥb-ḥry-tp* etc. The most emphasized title in his tomb is however *sm ḥrp šndit*¹⁴³. Because of this last title, according to Schmitz, *k3-n-nzwt* I was most probably not a born prince but obtained the royal title as a rank identification. Hölzl¹⁴⁴ noticed that the decline of the *k3-n-nzwt* family status demonstrated itself in the titles of the later generations. No later member of the family carried a royal rank or was active in any other

¹⁴²Son of *k3-n-nzwt* I

¹⁴³SCHMITZ, *Königssohn*, 77-8.

¹⁴⁴HÖLZL, *Sokar* 12, 43.

significant function. With the exception of one occupation of *k3-n-nzwt* II as a *hrp ḥ*, the few titles of *k3-n-nzwt* I's predecessors were confined to religious and honorific titles, two title categories which are so wide spread that no conclusions concerning their hereditary nature can be drawn from these individual cases.

In summary, the above distribution of titles in the three known families of CEE demonstrates that at least four fields of occupations were hereditary in the *sndm-ib* family, while two fields were hereditary in the *sšm-nfr* family. In the case of *the k3-n-nzwt* family, no observations concerning hereditary titles could be made.

We should now turn to the evidence presented by the titles of family members represented in tombs of their relatives. Depicted family members in CEE include the parents, the children, the spouse, the siblings and the grandchildren of the owners. 69 sons are mentioned in inscriptions or depicted in relief in the tombs of their fathers in CEE, 25 of these have no accompanying titles. Our statistical population for investigation the hereditary nature of titles through the father-son connection consists thus of 42 examples. 23 of these cases show evidence of title inheritance, since the son carries at least one similar title to his father, 16 of which belong to the above discussed three family lines in CEE. The titles of the remaining 7 examples belong to the scribal, palace, and religious title categories which are discussed above under the corresponding category.

Chapter Six
Estimation of Wealth of CEE Tombs

Textual sources indicate clearly that an ancient Egyptian would start building his tomb during his life time. The completion of the tomb on the other hand would as a rule take place while the tomb owner was still alive or would, in the case of his sudden death, be achieved post-mortem by his son¹. It is therefore a generally held concept that ancient Egyptian tombs are the manifestations of the financial abilities and the social rank of their owners.

Roth² remarked that the final form of a tomb was the outcome of the complex interaction of many factors, main among which are the economic resources available for the tomb. The study of the same author concerning the socio-economic analysis of the *ḥnty-š pr-ʕ3* cluster is a valuable source which was used in the forthcoming discussion concerning the estimation of the wealth of tombs in CEE. In the context of researching the distribution of resources in the tomb cluster under her study, Roth listed eleven potential areas of investment during the construction of a tomb, of which the following would be of interest to us in the current research:

- 1- The volume of bedrock excavated to create the subterranean part of the burial shaft and the burial chamber.
- 2- The quality of the limestone blocks that form the “skin” of the mastaba .
- 3- The amount of decoration, and its technique, content, and quality.
- 4- The number, size and content of serdabs.
- 5- The content of the burial chamber.
- 6- The endowment of land set aside to support the cult functionaries and the carrying out of mortuary rituals

In the following analysis several points of the above will be used to trace patterns of wealth distribution in CEE: the distribution of architectural elements and of grave goods, the effort invested in the excavation of the substructure and the building of the superstructure, and, on a limited scale, the presence of funerary estates and non-family dependants in the tomb reliefs.

1- Architectural elements

There are many ways in which the architecture of an ancient Egyptian tomb can be indicative of the economic capacity of its owner. Sizes of different elements of a tomb, the materials used for their execution and the sophistication of their craftsmanship are only some of them. In his gigantic Giza volume, Reisner developed a sophisticated typology for the constitutive elements of Giza tombs: the cores, the mastabas, the casings, the chapels, the shafts and the burial chambers. Since Reisner's classification was based on the physical nature of such elements, it is possible to use his typology

¹ALEXANIAN, *OKAA* 2006, 2-3.

²ROTH, *Giza VI*, 49-50.

to extract facts concerning the financial abilities of tomb owners. Several obstacles nevertheless face such an approach. First among such is the fact that the usage of a certain architectural type can not be considered a consequence of the economical resources of the owner alone. Roth³ for instance, who found a correlation between the position of an individual in the *hnty-š* hierarchy and the type of his chapel, was aware of the fact that such a phenomenon can equally be a manifestation of chronology rather than the personal choice of the tomb owner. Representing an obstacle for such an approach in the case of CEE in particular is the unfortunate circumstance that not all tombs were classified according to Reisner's typology. The pattern of excavations led Reisner to drop the a number of tombs in the central area of CEE from his classification (map 3.3). With such an input, spatial statistical tools can be easily fooled to indicate a clustered distribution.

The above mentioned points in view, the results of the following spatial analysis of architectural elements should be taken with some caution and only after careful visual examination.

1-1 Cores

The 152 mastaba cores of CEE which were classified by Reisner fell into 6 types: 2, 7, 8, 9, 10 and 11. Cores of the last four types were grouped together by Reisner only because they share the same type of chapel, while it is only the subtype of those four types that indicate their mutual building material. For this reason the categorization presented in the below table grouped the cores of the types 7,8,9 and 10 together according to their sub-classification. The masonry of subtypes a, b and c of Reisner is formed of Gray nummulitic limestone, the difference between the subtypes being the arrangement of stone courses⁴, which is of no interest for the current study. The two last subtypes were thus grouped together in the table as well.

Core	Number of tombs
Type II a	25
Type IV iii	1
variations of subtypes a, b, c	107
Variations of subtype d	4
Variations of subtype e	6

As the above table demonstrates (map 6.1), the 25 original cores of CEE were of type II a which is characterised by the retaining wall of small yellow drab limestone. This core type was used in other nucleus cemeteries in the WCE. Reisner⁵ has however remarked that the cores of CEE are built of a poorer quality of stone than the other nucleus cemeteries. Core type IV iii is built out of Gray nummulitic limestone and is characterised from the earlier types by the recess left in the core ab

³ROTH, *Giza VI*, 53.

⁴For types of masonry : REISNER, *Giza*, 178.

⁵REISNER, *Giza I*, 38.

origine for the chapel. The only core of type IV iii in CEE happens also to be the largest core in this cemetery (G 5110).

After that initial stage of building in CEE, the grey nummulitic limestone masonry came in use and became gradually the dominating type in CEE with which the overwhelming majority of cores were built. That masonry type was also the one employed in many state buildings in Giza: the core-work of the 3 large and 7 small pyramids and the great boundary wall south of the Western Field. The variety of this type in CEE might have been however of lesser quality than those previously employed in the monumental buildings.

Subtype d is a rubble-faced core-work which, according to Reisner, does not appear among the earliest stone mastabas at Giza⁶. Indeed the four cores of this type in CEE have rather advanced positions on the seriation graph 3.2 (106 to 240).

Subtype e, which has 6 occurrences in CEE, is a mastaba either entirely built of crude brick or has crude brick retaining walls with a filling of gravel or rubble. Before the erection of stone mastabas on a large scale since the reign of Khufu, crude brick mastabas were the prevailing type for private tombs. Brick continued in use however in Giza after the Fourth Dynasty when it is present in cemetery 3000 and in Abu Bakr cemetery⁷.

1-2 Casing

While Roth⁸ found the casing type more related to chronology than to the economic status of the owner, Reisner believed that some types of casing were used as cheap variations of the more expensive ones. If we attempt to estimate the economical value of casing types, there are three elements that should be taken into consideration: the quality of the stone, its size and the finishing of the surface. The second of those elements did not only affect the amount of stone cutting but also the speed at which the casing was achieved. Reisner for instance designated the X casing as the most expensive type being composed of small fine white Tura limestone finally fitted and smoothly dressed to a sloping surface. He also ranked casing type Y after X because the former type employed larger stones rising consequently more rapidly when applied to the face of the mastaba. Using the same principle of ranking, the remaining casing types can be arranged from the costliest to the cheapest: Z, U, ZU, W, crude brick.

casing	Number of tombs
W	11
U	5
Crude brick	3

⁶REISNER, *Giza I*, 39.

⁷SPENCER, *Brick architecture*, 25.

⁸ROTH, *Giza VI*, 54

Z	3
ZU	2
X	2
Nummlitic limestone ⁹	2

As the above table shows, 28 mastabas in CEE were classified according to Reisner's typology¹⁰ (map 6.2). The most costly casing type, X, was only used in two mastabas, both of which belong to dating category one (G 5080, G 5110). All other casing types which occurred in CEE employed the grey nummulitic limestone. Of these the most commonly used was the casing type W in which the large stone slabs were set in high courses and roughly dressed to a sloping surface. Crude brick casing occurs too in a few cases in CEE.

Cased tombs are generally of large area, mean of their areas being 277 m² versus 47 m² for the uncased tombs. Their positions on the seriation graph 3.2 are between 12 and 235. Their owners seem also of higher rank, among those were 5 viziers and 6 directors of works

1-3 Chapels

199 tomb chapels are located in CEE. Of those only 105 chapels were classified according to Reisner's typology. The 105 chapel belong to the following types (map 6.3):

Type 1: A crude brick chapel built against the face of the mastaba. This type occurs twice in CEE with two variations: as a chapel built exterior to stone chapel of type 2 b (variation 1 d in G 9410) and as a chapel built exterior to another stone chapel of type 4 (variation 1 f in G 4940).

Type 3a: An interior stone L-shaped chapel with a deep compound niche at one end of the west wall. This type was attested three times in CEE (G 5010¹¹, G 5040, G 4930). The three cores did not include any recess ab origine but were broken later to contain those interior chapels.

Type 4: A north-south offering room with two niches in the west wall in the south east corner of the mastaba. This is a relatively common type of chapel in CEE since it has 21 occurrences, of which 8 are with a subsidiary north niche (variation 4a) and 14 without a subsidiary north niche (variation 4 b¹²)

Type 5: A north-south interior corridor chapel extending more than half the length of the mastaba. This type has 16 occurrences in CEE of which 5 have one or more niches in west wall (variation 5a)

⁹Unclassified by Reisner to a specific type.

¹⁰The number is remarkably small due to the fact that the state of casing of most of the remaining CEE mastabas is not mentioned in the publications of Reisner. Whether this is due to the absence of casing for most cores or to the incompleteness of records is hard to know with certainty.

¹¹Chapel G 5010 was recorded once as type 4 b (REISNER, *cemetery En Echelon*, 11) and once as type 3 a (REISNER, *Giza I*, 208, 26). On the plan it seems to be of the later type.

¹²Reisner only mentions that the chapel of G 2177 is of type 4 with no specification of subtype, but I assumed that the absence of mention of a subsidiary niche means that there is none.

and 8 have an alcove with a chief niche (variation 5c)¹³.

Type 6: A cruciform symmetrical chapel with one or more niches in the west wall. Only two instances of this type occur in CEE. G 5110 has an interior cruciform chapel (subtype 6 b) and G 5230 has a unique exterior mastaba chapel of symmetrical design (subtype 6c). The fact that these are the only occurrences of chapel type 6 in CEE may reinforce the belief of Reisner¹⁴ that the owner of the two tombs *dw3-n-r^c* and *b3-b3.f* are related.

Type 7: A single or multiple room east-west interior chapel whose complex form was probably to provide more surface for relief. This type has 17 attestations in CEE of which 1 is a single room chapel (variation 7 a), 9 are a two-room chapels (variation 7b), 5 are multiple-room chapels type (variation 7c) and 3 are of variation 7d¹⁵.

Type 8: A roofed exterior chapel built against the façade of a mastaba. With 10 occurrences, this type is not widespread in CEE but it shows the widest range of variations since it includes 5 subtypes:

1- Two occurrences of roofed exterior chapels built against ordinary two niched mastaba (variation 8 a).

2-One occurrence of roofed exterior chapels built against a mastaba with two or more pairs of niches (variation 8b).

3- Four occurrences of a roofed exterior chapel built against mastabas with irregular niche-work (variation 8c).

4- One occurrence of a roofed exterior chapel built against a mastaba without niches (variation 8d).

5- Two occurrences of roofed exterior chapels of anomalous forms covering the façade of the mastaba (variation 8e).

6- One occurrence of a roofed exterior multiple room chapel (variation 8f)

Type 9: An open air exterior corridor chapel. With 34 attestations, this is the most frequently used chapel type in CEE. The 34 examples can be classified to the following subtypes¹⁶:

1- Six occurrences of Type 9 a : with a mastaba with two niches in the east façade

2- One occurrence of Type 9 b: with a masataba with two or more pairs of niches in the façade

3-16 occurrences of Type 9 c: with a mastaba with abnormal niche work

4- 10 occurrences of Type 9 d: with a mastaba without niches.

Type RC (V a): The interior subterranean rock cut chapel has one unique occurrence in CEE (G

¹³Chapels of G 5520 and G 2449 were said by Reisner to be of type 5, with no specification, of subtype. Reisner was not certain if chapels of G 2193-2194 and G 2422 are of types 5 or 8.

¹⁴REISNER, *Giza I*, 69, note 1

¹⁵.The chapel of G 23878 was recorded as type 7 without specifying the subtype. Types 7 b (2) and 7 b (1) are recorded for the two chapels of G2175 but no explanation for the number between brackets is to be found in the documents of Reisner.

¹⁶Chapel of G 2166 was not included in the sub-classification since Reisner only mentions that it is of type 9 with no specification of subtype.

2196) in which a serdab was carved as well. It was perhaps during the cutting of one of the mastaba's original shafts that the builders noted an out-cropping of natural rock at an exceptionally high level, a circumstance which perhaps inspired and certainly made possible the creation of the rock cut chapel. A problem is posed by the shafts and the identity of the original owner of this mastaba. The position of one shaft in the floor of the chapel indicates that this is the burial of *i3-sn* himself. Simpson¹⁷ suggested however that mastaba G 2196 was built for another individual, with the corridor at the same time, but *i3-sn* subsequently usurped the corridor, placed his names and titles on the entrance, and built the rock cut chapel.

From the above summary it appears that adopting to the changes in the availability of space during the growth of the cemetery has affected the choice of the chapel type. The use of the chapel type 1 for instance declined in Giza since the beginning of the Fifth Dynasty because, according to the belief of Reisner¹⁸, the mastabas built afterwards tended to be small or intruded into smaller spaces. Indeed the two occurrences of this type in CEE belong to the three original lines of the cemetery being attached to two large mastabas which had an early order on the seriation graph 3.2.

When the nearest neighbour statistic was carried out for the distribution of each of the above mentioned chapel types, the outcome demonstrated that the 44 chapels of types 9 and 8 cluster (map 6.4). Even by visual observation it is clear that chapels of those two types are concentrated in CEEN, and are mostly associated with tombs of smaller size. Types 9 and 8 were perhaps the simplest and the least resource- requiring among other chapel types. The exterior corridor chapel represented by these two types was originally an old type that has been used since the Third Dynasty but came to be reintroduced later because it required only the marking of the offering place, the enclosing of the chapel area by walls being an option left to the mastaba owner. In Giza, as Reisner remarked¹⁹, the enclosing wall or partial wall was a rarity and the limits of the chapel were rather formed by the surrounding mastabas. In contrast to type 9, type 6, which is one of the least occurring chapel types in CEE, is not adapted to mastabas crowded together in a great cemetery. This type can only be used for a mastaba on an independent site with free space undisturbed by the neighbouring structures in front of it²⁰. Its rarity in a high density cemetery like CEE is then to be understood.

54 of the of the total number of chapels were drawn on our map of CEE by points which represent their locations only since their borders are not to be reconstructed from the records of Reisner or Junker. Our observations concerning the sizes of chapels will depend thus on the 145 chapels of reconstructible area. Morans I index indicated that there is no spatial autocorrelation between those

¹⁷SIMPSON, *Giza* IV, 16.

¹⁸REISNER, *Giza* I, 200.

¹⁹REISNER, *Giza* I, 283.

²⁰REISNER, *Giza* I, 248.

chapels based on their area. Since another statistical analysis with the same tool demonstrated that tombs of CEE tend to cluster according to their sizes, the proportion of the area of chapels to that of their tombs is apparently not fixed. Calculations actually showed that this proportion ranges between , 01 to 1,95, mastabas with a similar chapel-tomb proportion being randomly distributed within the CEE.

1-4 Decoration

One of the above mentioned areas of investment listed by Roth²¹ for the purpose of analysing the wealth of tombs, namely the decoration, forms a bit of an obstacle for the current study. Unless extensive effort is expended in classifying the iconography of the OK tombs into categories according to the quality of the decorated scenes, judgement concerning this point will remain impressionistic. The quantitative approach, employed by Roth, based on the calculation of the area of the decorated parts of the wall or the height of the relief baseline is not possible for the current study since no archaeological records provide such data for the decorated tombs of CEE. Moreover, Kanawati²² argued that decoration is a non-indicative criteria for the rank of the tomb owner since death of owners interrupted the completion of decoration in many cases. Therefore, decoration was included in the present analysis in regard to its existence or absence only. Even in this case our task is not free of obstacles since in the debris of 26 of the undecorated tombs fragments of relief or inscriptions were found, suggesting the existence of decoration in antiquity. The displacement of relief blocks and the problems associated with their attribution to individual tombs is yet another obstacle. For these reasons the below figures should only be considered tentative.

65 tombs in CEE have decorated chapels²³ versus 287 tombs which have no decorated surfaces. The average tomb size of the first category (150,7 m²) is much larger than that of the second (45 m²). 77 owners on the other hand had to be content with a false door only²⁴ but no other scenes were registered on the walls of their chapels. Map 6.5 shows the distribution of tombs of CEE according to their decoration status.

In the context of decoration, the case of the undecorated mastaba G 5230 is worthy of attention. Not only is this mastaba one of the largest in CEE (700m²) but it is also the only undecorated tomb of a vizier at Giza²⁵. The absence of decoration in large tombs could be explained by a case of economical insufficiency which occurred after the owner had exhausted his resources in filling all

²¹ROTH, *Giza* VI, 49-50.

²²KANAWATI, *Administration*, 7.

²³As decorated tombs here were considered those which have one or more scenes other than those which are carved on the false door.

²⁴Those false doors might be inscribed or uninscribed, yet at any case carving the false door jambs and drums must have required a considerable effort.

²⁵STRUDWICK, *Administration*, 82-3 (42)

the area allocated to his tomb²⁶. The other owners of fully decorated tombs might have taken wiser decisions concerning the allocation of their resources, as texts mention several instances of a tomb owners who built a smaller tomb, or used a shared family tomb, in spite of the fact that he was entitled to an area for a large or an independent tomb²⁷.

1-5 Serdabs

112 serdabs belong to 85 mastabas in CEE. As shown on map 6.6, the nearest neighbour index indicated that the distribution of tombs with serdabs is random. Fourteen mastabas had multiple serdabs, the number of serdabs ranging between 2 and 10. The costliness of two cases is worthy of mention. The owner of G 5230 had two statue houses in front of his mastaba, each of which had 4 serdabs. G 5080 had an annex in a form of a large statue house to the south of the mastaba which included 10 serdabs²⁸.

The majority of serdabs were found empty, but they had been most probably plundered. The contents of occupied serdabs are consisting, as a norm, solely of statues whose material, subject and number were variable. The main manufacturing material for serdab statues was wood, although few examples of limestone, alabaster and granite occur as well. In most cases, several single or dyad statues represented the owner, probably at different stages in his life, and not infrequently the owner was represented with his wife. Remains of servant statues were also found in two cases (G5411, S 676). It has been suggested that the occupants of secondary shafts of mastabas whose serdabs house servant statues are the same subordinates of the tomb owner who are represented by those figures²⁹ but no particular example for this case could be traced in CEE because of the absence of inscriptions on the servant statues found.

Roth³⁰ has noticed the decline in the area of subterranean construction parallel to the increase of the area of serdabs in the same tombs. She argued for a functional exchange between the burial chamber and the serdab since they are both concerned with preserving the likeness of the deceased³¹. To investigate the relationship between the changes in the sizes of the serdab and the burial chamber, the value of the correlation coefficient, a measure which determines the degree to which the two variables are associated, was calculated. The result obtained for the correlation coefficient between the area of the serdab and the volume of the burial chamber in CEE was ,67. This value indicates a moderate positive relationship between the sizes of both architectural elements, disagreeing with the observations of Roth for her tomb population.

²⁶ROTH, *Giza* VI, 53.

²⁷N. KANAWATI and ABDER-RAZIQ, *ACER* 13 (1999), 37–38, pl. 59; KLOTH, *Biographische Inschriften*, 217;

²⁸These large statue houses were included in the GD as one serdab each, so that the spatial statistical tools will not consider those groups as clusters of serdabs.

²⁹ROTH, *Giza* VI, 57.

³⁰ROTH, *Giza* VI, 57.

³¹ROTH, *JARCE* 39, 103-121.

1-6 Shafts

In CEE there are 1800 shafts which were found in a variety of states: intact (rare), partially disturbed, plundered, re-used and mixed period burials. 747 shafts were classified according to the typology of Reisner.

Type	Number
Type 1 b(1)	1
Variations of type 3	9
Variations of type 4	16
Variations of type 5	34
Variations of type 6	177
Variations of type 7	149
Variations of type 8	344
Variations of type 9	17

The above table demonstrates that the most frequently occurring shaft type in CEE is 8, which happens to be the predominant type of the intrusive shafts of the late OK period³². That type presents a form in which neither the shaft nor the burial chamber enter the rock but only penetrate the filling of the mastaba or the sand filled corridors and chapels of the older cemetery. The overwhelming majority of shaft type 8 in CEE is clustered as the nearest neighbour analysis yielded and is concentrated in CEEN as the directional distribution ellipse demonstrated (map 6.7). This outcome indicates that the CEEN was subject to intrusive shafts more than any other area of the cemetery.

The next most common shaft type in CEE is type 6, a development of shaft type 5 which is characterised by the absence of the connecting passage between the shaft and the burial chamber. The capacity of the chamber of this shaft type (2 m²) is less than the average chamber capacity in CEE (2,5 m²). Actually chambers of shaft type 6 are sometimes so small that the burial lies partly in the shaft protected by a constructed extension of the chamber. Reisner was of the opinion that the frequent use of this type is a result of the increasing poverty of the community using the Giza necropolis during the Fifth and Sixth Dynasty³³. Again this shaft type is concentrated in CEEN.

The two shaft types 8 and 6, generally considered to be poor shaft variations, happen to have more wealthy versions in CEE since the maximum recorded volume of each type was 19 and 45 m² respectively. Worthy of attention is that when shaft type 6 was used in the CEES, it was in many

³²REISNER, *Giza I*, 101

³³REISNER, *Giza I*, 95.

cases not intrusive but the major shaft of the tomb. The two shafts of G 5010 for example, both of type 6, seem to be the two original shafts of the mastaba. Shaft 8 on the contrary has no instances where it occurs as the original shaft of the tomb, all cases being intrusive.

Shaft type 7 was also a relatively common type in CEE. This type is an open-pit shaft with the burial on the bottom of the shaft or in a chamber constructed into the wall of the shaft. The shafts of type 7 came into use as the subsidiary shafts of the Fifth Dynasty and increased in frequency in small mastabas of the Sixth dynasty³⁴.

The most wealthy shaft type, a square shaft with a large stone lined chamber, has one very doubtful occurrence in CEE. In an unpublished manuscript of Reisner³⁵ he recorded that shaft 2325 X was of type 1 b(1). This is most probably a mistaken record, not only because the shaft is intrusive, but also because of its small capacity (1,37 m²). While apparently no attestations of shaft type 1 are known in CEE, its cheapened variations are present in the form of shaft types 3, 4 and 5. The modifications made in these three successive types aim at reducing the cost of execution by excluding the stone lining of the burial chambers (in type 3) and diminishing its dimensions (in types 4 and 5).

In shaft type 9 a sloping passage rather than the square shaft leads to the burial chamber and both are cut into the rock. Sometimes, the passage is lined and roofed with stone slabs to form a smaller sloping passage inside. The aim of the sloping passage was probably cultic. According to Junker³⁶, this shaft type enabled the deceased to ascend from his tomb. According to Reisner³⁷ however the sloping passage shafts served two practical purposes: to facilitate the introduction of a stone sarcophagus and to provide more protection against tomb robbery. The passage design obviously did not fulfil the later function in CEE as most shafts of type 9 were found plundered. Shaft type 9 was first attested in the royal tombs of the first dynasty at Abydos³⁸ but came into use at Giza for private tombs during the later Fifth Dynasty and the Sixth Dynasty. The earliest dated private example in Giza originated from the CEE and belonged to the founder of the *sndm-ib* family (G 2370). As the *sndm-ib* complex grew, the sloping shaft type became characteristic for the members of this family, and seven more examples were constructed. Map 6.8 demonstrates the distributional trend of this shaft type in CEE. A noteworthy feature in this distribution is the concentration of the sloping shafts in the eastern strip of the cemetery, a phenomenon which might be explained when considering the construction requirements of this shaft type. In 12 out of the total 17 attested cases of shaft 9 in CEE, the opening of the shaft is not located in the body of the mastaba but at a distance from it that ranges between 1,3 to 38 m. An area free of occupation to the east of the tomb was thus

³⁴REISNER, *Giza I*, 98.

³⁵REISNER, *Additions*, 56 b.

³⁶JUNKER, *Giza VIII*, 5.

³⁷REISNER, *Giza I*, 150.

³⁸JUNKER, *Giza VIII*, 4.

necessary to excavate shaft 9, a condition which was probably only available in the eastern area of CEE at the time in which these shafts were excavated. The excavation of this shaft type must have required great effort taking into consideration the large capacity of its chamber (maximum record in CEE 50 m²). A favourable excavation ground would have been thus of advantage. Though no geological reports exist to detail the suitability of different areas of the Giza plateau for subterranean excavations, it is probably possible to assume that the ground in the eastern stripe of CEE was less difficult to excavate than the area to its west. Roth³⁹ saw a similar relation which might attribute the depth of the shaft to geological factors; for example to the depth of a particularly good stratum in the bedrock in which chambers might be cut.

In summary, shaft types which occur in CEE can be classified to three broad categories:

2- Shafts without chambers or with chambers that do not enter the rock (types 7,8). The overwhelming majority of the total statistical population belongs to those two less costly types, most of which were intrusive shafts.

1- Shafts with rock cut chambers (types 2, 3, 5, 6)

3- Sloping passage tombs (type 9) whose occurrence is almost limited to the eastern stripe of CEE.

Noteworthy is that the increase in number of attestations of shaft types 2 to 8 in CEE is proportional with the descending quality represented by each⁴⁰. Quite worthy of attention too is the tendency of the distribution of cheaper variations towards the direction of CEES as shown by the slandered deviation ellipses (map 6.9).

2- Effort expenditure

Effort expenditure is a relatively frequent method used in pre-historical archaeology to research the social inequality between burials⁴¹. Castillos for instance used the volume of graves to research the social stratification in 19 Egyptian cemeteries which date to the pre-dynastic period⁴².

The first systematic study which included calculations for effort expenditure for Old Kingdom tombs was the one composed by Kanawati⁴³. To evaluate the wealth of each tomb under study he took the following elements into consideration: the area, material and type of the mastaba and of the chapel, the number of shafts, the depth of the main shaft, the area and the capacity of the burial chamber and the number of serdabs.

³⁹ROTH, *Giza VI*, 57.

⁴⁰The only exception being shaft type 6 whose attestations outnumber slightly shaft type 7.

⁴¹TAINTER, *Mortuary practice*, 10.

⁴²CASTILLOS, *Remarks*, 1-5; CASTILLOS, *RdE* 49, 25-36.

⁴³KANAWATI, *Archaeological and Historical Studies* 5, 1-20; KANAWATI, *Administration*, passim.

The estimation of wealth of tombs was employed by Seidlmayer⁴⁴ as well to trace the economic and social changes during the transition period between the OK and MK in the area of Qau-Matmar by calculating the volume of shafts and studying the frequency and distribution of burial goods.

Richards⁴⁵ developed a qualitative method for measuring the mortuary variability during the Twelfth Dynasty at Abydos. Her model was based on, among other factors, the effort expenditure which was calculated using several variables including the size, type and elaboration of graves. In the following is a discussion for the volumes of superstructure and substructure of CEE tombs.

2-1 The superstructure

The volume of the core was taken in the present research as an indicator for the effort invested in the execution of the superstructure. 388 tombs in CEE possess superstructure or show evidence that they once had such. On the other hand, 39 tombs have a substructure but no superstructure, many of these consist merely of shafts that were grouped together by Reisner or Junker⁴⁶.

The size of the open spaces within the core (the interior chapels and the serdabs) is a point which should be taken into consideration in the context of effort expenditure calculation. While the volume of these hollow spaces should be subtracted from the total volume of the core, the effort employed for building these rooms should be added. This fact can fortunately be used to compensate the discrepancy in results when, as in the current case, such spaces are simply dropped out of calculations. Several superstructures in CEE have no cores but consist only of outer walls bordering a multi-room chapel. Others superstructures are so destroyed that it is hard to determine whether they formed once a complete mastaba or an offering room only. For those superstructures the same measure of effort was used as in the complete mastabas.

Two dimensions are primary required for calculating the volume of the core: the area of the mastaba and its height. The accurate determination of both elements in many CEE tombs is open to question. In the case of the mastaba area, 95 tombs of CEE have no recognisable borders because of the severe deterioration of their superstructures. In our map of CEE those tombs were represented by the least rectangular enclosing their shafts, and the calculations of superstructure volume were based on the area of this rectangular. The actual height of the mastaba is on the other hand only rarely available, either because the height of the mastaba is not preserved in its current state today as it was in antiquity, or because the archaeological records omitted such a measure from publications. In the present study the approach used was to estimate the unknown heights of the mastabas depending on the known height of the neighbouring well preserved mastabas, taking into consideration the area of the mastaba in question. Rendering this approach valid was a result

⁴⁴SEIDLMEYER, 'Wirtschaftliche und gesellschaftliche Entwicklung', 175-217.

⁴⁵RICHARDS, 'Mortuary Practice', 33-42.

⁴⁶Though such tombs have never possessed superstructures, they were represented on our map of CEE by polygons which enclose their shafts to include them in the spatial statistical operations.

granted by the Morans I index stating that our population of mastabas with recorded heights (98 in number) cluster spatially according to the values of their heights (map 6.10). To predict the values of the unrecorded-unpreserved heights of mastabas the ordinary least squares statistic was thus employed, a method usually used to model a dependent variable in terms of its relationship to a set of explanatory variables.

The values acquired for the volumes of the CEE cores were represented on map 6.11 . Illustrated on graph 6.1 are the volumes of CEE cores along time, using the position of each core on the seriation graph 3.2 as the date indicator. It is evident that values of superstructure volume fluctuated during the life time of the cemetery. Yet it is also possible to notice that the early growth of the cemetery, represented by tombs occupying the first 30 positions on seriation graph 3.2, is also characterised by an average larger volume, and several mastabas which are remarkably voluminous. Here it became obvious that two cores (G 5230 and G 5110) topped the record by their extraordinary high values. The anomaly of these two tombs in contrast to other tombs and their similarity to each other in many features stresses again the validity of the belief of Reisner that the two owners were related by blood.

2-2 The subterranean volume

The subterranean volume was calculated as the sum of the volume of the shafts, burial chambers, burial pits, passages and canopic recesses. The measurements for such elements were available for 302 tombs in CEE. From those, 4 cases⁴⁷ had to be discarded since the volume of one or more of the previously mentioned elements is missing, creating the misleading impression that the substructure was smaller in those cases than in other tombs of comparable size . To trace the changes in substructure volume during the cemetery history, the subterranean volume of the 298 valid tombs was represented on line graph 6.2 against the position of each tomb on the dating seriation graph 3.2. It is possible to notice two periods during which the volume of tomb substructure increased: in the earliest tombs of the cemetery and in the latest ones. In the middle of line graph 6.2 the values fluctuate, with one incident of a huge substructure value in G 5332. This fluctuation in values causes a difficulty in interpreting the general trend of the relationship between volume of superstructure and time, a relation which might be illustrated more clearly mathematically. The coefficient of correlation between the two variables was calculated and the value obtained was -.43, indicating a weak negative relationship. This result means that, in general, the substructure volume of tombs decreased as CEE grew, though it cannot be considered the rule. In contrast to the case in the *hnty-š* cluster, where the subterranean volume seems to be closely related to chronology⁴⁸, the last factor is less evident in CEE.

⁴⁷Tombs: G 5220, G 5380, G 2181a, S729-729 C.

⁴⁸ROTH, *Giza* VII, 57.

Another difference that exists between the CEE and the *hnty-š* cluster concerns the ratio between the substructure volume and the area of the mastaba. Roth, comparing the subterranean volume to the area of the mastaba, noticed the independence of the volume of the shaft from the mastaba area. The subterranean volume in CEE on the other hand is closely related to the area of the mastaba. The correlation between the two values in the 298 mastabas, for which the volume of substructure was available, is ,72 indicating a strong positive relationship.

A similar positive relationship exists between the superstructure and the substructure volumes since the coefficient of correlation between the two variables is ,6 (graph 6.3). Worthy of attention that, however, that the increase in the substructure volume is not always rationally correlated with the increase in the superstructure volume, the ratio between the two variables being between ,19 and 123 . It is in the largest tombs that the ratio between the superstructure and the substructure is specially high, probably for the simple fact that once a maximum underground cavity was reached it was not wished to increase the substructure any more. This behaviour could perhaps be justified by the functional use of the substructure for the storing of the mummy and the accompanying grave goods, versus the communicative role of the superstructure in establishing a distinctive position for its owner in the setting context of the cemetery, being seen and perceived by the living.

Morans I index indicated that tombs cluster according to the value of the substructure volume while the high-low clustering indicated that the low values cluster (map 6.12). A hot spot analysis spotted the recognisable clusters of neighbouring tombs with similar substructure volumes⁴⁹.

2-3 Artefact distribution

The analysis of grave goods distribution is probably the most commonly used method to trace the economical disparities as reflected by burials within a cemetery⁵⁰. Seidlmayer⁵¹ for instance used the number of the pottery vessels pro tomb to research the possibility to divide tombs into wealth classes in Armant, Tura and Tarkhan during the Naqada period. In another study, the same author examined of the distribution of pottery finds in tombs of males and females and attempted to assess the distinction in terms of wealth between the two genders⁵².

To estimate the value of grave goods, Shenan⁵³ assigned them points on a scale of wealth making the assumption that valuable objects were those which took a long time to manufacture, or were made of materials brought from a distance or difficult to obtain. Richards⁵⁴ developed a similar sophisticated cost index for each material of grave goods based on scores assigned to various levels

⁴⁹Tombs represented by dark blue colour in map 6.10.

⁵⁰BAHN and RENFREW, *Archaeology*, 175 ff

⁵¹SEIDLMEYER, *GM* 104, 25-51

⁵²SEIDLMEYER, "Wirtschaftliche und gesellschaftliche Entwicklung", 175-217.

⁵³SHENAN, 'Social organization', 279-88.

⁵⁴RICHARDS, 'Mortuary Practice', 33-42

of distance, modes of transport, methods of extraction, pre-working processing and hardness of material.

Because of the disturbed nature of burials in the tombs under her study, Richards did not take the quantities of the discovered grave goods into consideration but concentrated rather on the presence or absence of objects. Since the majority of shafts of CEE were plundered or at least disturbed, resulting in no more than fragments of objects found in several cases, the current study used a similar approach which is based on the variability of type and materials of grave goods rather than their number. The model of Richards, which includes 34 ranked raw materials, was adopted in the present study after inserting additional materials into the scale which is summarised by the below table.

material	value	Number of tombs in CEE
lapis	17	1
Bronze	16	4
copper	15	24
diorite	14	9
basalt	13	5
gold	10	12
sandstone	12	11
granite	9	19
faïence	8	29
flint	7	17
carnelian	6	3
alabaster	5	44
limestone	4	66
wood	3	60
pottery	2	62
mud	1	7

As the above table demonstrates, Lapis Lazuli was ranked at the top of scale as a material which is brought from a great distance and extracted and worked with a high level of proficiency. That material occurred only once in CEE in form of beads found in shaft G 5080 B . Its finding spot in the tomb of *sšm-nfr* II (G 5080) agrees perhaps with the costliness of this material, since the mastaba shows other significant indications of wealth in terms of superstructure volume, funerary estates and number of dependants represented in decoration. The same relationship between the costliness of the material and the apparent wealth of the tomb owner can be traced in the case of bronze. With a scarce natural occurrence in Egypt, that material was apparently imported from

western Asia⁵⁵, and was only exceptionally used in Egypt before the Middle Kingdom⁵⁶. Bronze was spotted in four cases (G 5230, G 5210, G 5220, G 2370), four of the largest mastabas in CEE, two of which belong to viziers. Even in those tombs, whose owners had apparently abundant resources, bronze was used in comparatively small amount, being employed in arrow heads or rings.

Diorite is an extremely hard rock difficult to work into statues. Indeed six of the nine occurrences of this stone in CEE take the form of bowls, while two other cases (G 5231, G 5230) show fragments of diorite statues which are most probably usurped royal sculptures. Many fragments of such statues were found scattered around the area east and south of the mastaba G 5230⁵⁷. These statues, many of which carried the name of king Khafre, were apparently removed from the pyramid temples in order to break them up for the fashioning of model vessels. The only possible, yet unlikely, original occurrence of a diorite statue in CEE is the shaft of S 766, where a lower part of an unidentified statue was found. Junker⁵⁸ did not consider the positioning of the statue in the shaft as a reason against considering it original to the owner of S 766, since the occurrence of statues in the burial chamber is known from the end of OK. It was rather the contrast between the material of the statue and the poor mastaba that led Junker to believe that the statue did not belong originally to the person buried in S 766.

Basalt is one of the least occurring materials in CEE. Despite its hardness and the consequent difficulty of working it, this stone was used for making vases⁵⁹, as in four cases in CEE. In one case, G 2407, basalt was formed as a whetstone. The hardness of basalt made it perhaps suitable for this flat tool which is used to grind and hone the edges of metal tools and implements⁶⁰.

Limestone⁶¹ was by far the most common material used for grave goods in CEE. Objects manufactured out of this stone in CEE vary in size and include sarcophagi, canopic jars, statues, offering basins, bowls, rubbing stones, headrests and one example of a model baking oven.

Pottery was, not surprisingly, the second most widespread material found in CEE, not only because of its low cost but also because it was the usual material utilized for vessels that were connected with funerary ceremony and cult services⁶².

Wood was also a frequent material for grave goods in CEE, being used for coffins, statues, headrests and boxes. The exact type and consequently the origin of wood used for objects found in

⁵⁵LUCAS, *Materials*, 219.

⁵⁶SCHORSCH, *MDAIK* 48, 145, note 3.

⁵⁷REISNER, *Additions*, 32.

⁵⁸JUNKER, *Giza* VIII, 65.

⁵⁹LUCAS, *Materials*, 407.

⁶⁰PAUL and SHAW, *Materials*, 23.

⁶¹False doors and offering tables are different in nature than the grave goods because they do not occur in shafts, but they were included in the present analysis as an indication of sophisticated labour.

⁶²RZEUSKA, 'Pottery', 157-167.

CEE is unidentified. It is widely accepted that Egypt, lacking native wood of superior quality, traded for timber from the Levant, the major imported species, it is often stated, being cedar, cypress, juniper, fir and pine. Harvey⁶³ found it however likely that most OK statues were not made out of imported woods but of native timbers. The same generalization can perhaps also be applied to the case of coffins, albeit with lesser validity. In a study carried out by Davies on 36 wooden coffins with variable dates from several provenances, 24 of those were found to be of local sycamore fig⁶⁴. At least one instance of imported wood was attested in CEE. Junker recorded that the intact coffin found in S700 was made out of a type of conifer wood whose texture seemed to indicate spruce wood⁶⁵.

Granite was utilised in CEE for statues, axe heads and hammers. The only coffin made of this material in CEE was that of *b3-b3.f* (G 5230). That the same tomb has a huge subterranean volume would perhaps reinforce the impression that the employment of hard stones for carving such large objects required a great financial resources.

Alabaster artefacts occur frequently in CEE in the form of: vessels, vases, headrests, offering tables, canopic jars and statues. According to Lucas⁶⁶, this stone was always a favourite with the ancient Egyptians, not only due to its fine appearance when polished, but also because, being a soft stone, it was easy to work. Alabaster vessels were most likely limited only to funeral use since the consistent of alabaster, gypsum, is fairly soluble in water and would disintegrate if actually used as a container for liquids⁶⁷. Even though alabaster was not of a comparatively high value as a material, usurpation of older statues was still a source of obtaining it. For instance, the alabaster statuettes of *b3-b3.f* (G 5230), estimated to have been between 30 and 50 in number, were taken from their serdabs, at the same time as the above mentioned royal diorite statues were removed from the pyramid temples, in order to break them up for fashioning alabaster model vessels. A workshop for alabaster vessels was started in the corner formed by the mastabas G 5110 and G 523068.

With 17 occurrences, flints were attested not quite frequently in CEE. Reinsner⁶⁹ has traditionally viewed flints as impractical tools which, since the first Dynasty, were employed for ceremonial purposes only. Conrad⁷⁰ argued however that, since flint tools occur in a wide range of non-funerary contexts, it seems that they continued to be of economic importance throughout the dynastic period. Gold was found in CEE in form of beads, bracelets, collars and foils. The relative value of gold was adequately estimated by Richards at the middle of her scale since this material was available as a

⁶³HARVEY, *Wooden Statues*, 3.

⁶⁴DAVIES, 'Ancient Egyptian Timber', 148.

⁶⁵JUNKER, *Giza VIII*, 166.

⁶⁶LUCAS, *Materials*, 406-7.

⁶⁷ASTON, *Stone Vessels*, 48

⁶⁸REISNER, *Appendix A*, 38.

⁶⁹REISNER, *Naga-ed-Der III*, 154.

⁷⁰CONRAD, *MDAIK* 56, 21-22.

native metal, required no complex or laborious smelting procedures⁷¹ and, at the Old Kingdom, its resources were not yet despoiled.

Carnelian occurs in the form of beads in three tombs in CEE. The scarce occurrence of this stone in CEE contradicts the fact that it was one of the most widely used semi-precious stones in all periods for jewellery, amulets and inlays⁷². The large size of the tombs where carnelian occurs (G 5280, G 2381, G 2375) and the fact that two of the owners were viziers, should perhaps call for a reconsideration of the relatively low value of carnelian as suggested by Richards.

To investigate the relationship between the costliness of the material and the size of the tombs in CEE, the coefficient of correlation was calculated between the value of the material on the above scale and the mean of tomb areas in which the material occurred. The result obtained was ,45 which indicates a positive relationship, though not of a strong degree. In other words the most valuable materials, though often occurring in the largest tombs, can also occur in smaller tombs. The directional distributional ellipse of each grave good material was represented on map 6.13 but no certain distribution pattern could be recognised.

Cluster analysis was used by O'Shea⁷³ and by Peebles⁷⁴ to investigate the social structure within a cemetery in terms of grave goods accompanying the deceased. Adopting the same approach, an attempt was carried out to group tombs of CEE according to the materials of grave goods attested in their shafts. For this purpose the Winbasb software was utilized. The outcome of this operation was represented on Dendrogram 6.1 which shows the classification of tombs according to eight similarity levels existing between the materials of their finds.

To investigate the global spatial distribution of tombs that possess grave goods made out of the similar material, the position of each tomb on Dendrogram 6.1 was entered in the table of attributes of CEE tombs as a serial number. When Morans I index was calculated using this serial number as an input, the outcome indicated that the distribution is random (map 6.14). Spatial autocorrelation statistics such as Moran's *I* are global in the sense that they estimate the overall degree of spatial autocorrelation for a dataset. The possibility of spatial heterogeneity suggests that the estimated degree of autocorrelation may vary significantly across the area. Therefore, several local statistical tools were used to trace a trend in the distribution of the different tomb groups on the eight similarity levels of Dendrogram 6.1, but the outcome indicated that even those tombs within the same similarity level are either random or dispersed.

The accurate interpretation of the relationship represented by Dendrogram 6.1 is thus open to question since, in addition to the above, the groups of tombs on the eight similarity levels in the same Dendrogram do not exhibit any other distinctive pattern neither in their sizes nor in concern to

⁷¹NICHOLSON and SHAW, *Materials*, 161.

⁷²ASTON, *Stone Vessels*, 67

⁷³O'SHEA, *Mortuary variability*, 122 ff.

⁷⁴PEEBLES, *Moundville*, ?

the titles of their owners. An apparent limitation of the results presented by the cluster analysis of grave goods in CEE is the fact that , with the exception of few shafts, no shaft was found intact in this cemetery, the distribution of finds being thus, to an unpredictable degree, a reflection of the randomness of tomb plundering. The volume of the burial chamber was used by Roth⁷⁵ as an indicator for the quantity of grave goods, assuming that the greater quantity of burial equipment would require greater security and perhaps thus deeper shafts. In the current study no similar assumption was however embraced, fearing that such an approach will only widen the gap between the smaller and larger tombs based on no solid ground.

Parallel to the estimation of the cost of grave goods based on their material, was the estimation of cost based on the sophistication of each object type. An alabaster statue would require for example more effort to be executed than a jar made out of the same material and consequently the former was rated higher than the later. The rating of such objects will be used as an input in the next section dealing with the estimation of wealth of tombs.

2-4 Intact shafts

48 shafts⁷⁶ were found intact in CEE. Nearest neighbour analysis indicated that these shafts cluster, and even to the naked eye it is obvious that they are concentrated in CEEN (map 6.15). In CEES on the other hand, only a handful of shafts escaped plundering, none of these are located in the mastabas of the three original en Echelon lines, which were obviously subject to tomb robbery more than any other area in CEE.

Intact shafts give usually the unique opportunity of studying the original content of burials. It would have been useful in the context of the current study to compare the contents of those shafts with their volumes and their other features⁷⁷. Surprisingly, or not, most of the intact shafts have nothing more than the body of the deceased wrapped in most cases with bands and lying occasionally on a reed mat. It is obvious that tomb robbers knew exactly which shafts to target and could spot those richly endowed using their experience and knowledge of the cemetery. Out of the 48 intact shafts we have then only 11 which possess grave goods, most of which are scanty. Two exceptions occur however. The grave goods in S 316⁷⁸ are large in number and multiple in their types and materials including: a wooden coffin, a copper head band and arm bands, an alabaster and pottery jars, alabaster offering basin and copper tools. The richest of all intact shafts in CEE is doubtlessly the

⁷⁵ ROTH, *Giza* VI, 56.

⁷⁶Shafts: G 2381 A, G 2414 C, G 2415 E, G 2416 D, G 2418 C, G 2418 F, G 2418 G, G 2418 V, G 2419 B, G 2419 Y, G 2420 Y, G 2422 E, G 2423 Y, G 2435 A, G 2436 X, G 2441 a C, G2443 B, G 2443 E, G 2443 Y, G 2444 C, G 2444 a B, G 2445 Z, G 2462 D, G2462 Y, G 2465 a A, G 2465 b B, G 2468 E, G 2469 a E, G 2472 a A, G 2472 a B, G 2475 B, G 2475 C, G 2475 a B, G 2476 C, G 2476 D, G 2477 A, G 2482 A, G 5510 E, G 5520 D, G 2196 C, G 2402 b A, G 2405 B, G 2407 C, G 2371 U, S309, S 316, S 312, S 346, S 812, S 755.

⁷⁷Such as the lining of the inner walls of shafts with limestone, mud bricks or rubble.

⁷⁸JUNKER, *Giza* VII, 48-9.

sloping shaft G 2381 A⁷⁹ which contained 394 objects including: a wooden coffin, copper tools and tables, slate and crystal dummy vessels, alabaster model basins, pottery jars and bowls, wooden boxes and food offerings of fowl or meat.

The small number of intact shafts with grave goods would, if used for an analysis, hardly allow any valid generalization about the other shafts of the CEE. In spite of that the score of the grave goods was tabulated on graph 6.4 against the volumes of shafts to document the factual situation.

3- Wealth matrix

The above discussion made it probably clear that considering each factor involved in tomb construction separately fails to fulfil the need to reach an overall conclusion concerning the economical capacity of tombs owners in CEE. A sophisticated model is consequently needed to identify the patterns of access to labour and materials. For this purpose a matrix which includes multiple wealth elements was developed. Had all tombs of CEE been classified by their excavators according to a uniform system, it would have been suitable to include the above discussed architectural elements of tombs in the present matrix. Such elements would have been ranked according to their size and degree of complexity, as described above. Since this is not the case for CEE, our matrix includes those elements which are available for the largest number of tombs: Volumes of superstructure and substructure, presence of decoration, presence of false doors in undecorated tombs, presence of serdab, presence of casing and grave goods (ranked according to their materials and type). The superstructure volume was entered in cubic meters divided by 5 to keep the values of this element in good ratio with the other elements. The scores given to each point are summarised in the below table. The sum of all scores was attached to the corresponding tomb so that each tomb had an overall score which was indicative for the wealth of its owner. Tombs were represented on map 6.16 according to this economical score.

element	score
Superstructure volume	The actual value divided by 5
Substructure volume	The actual value
Presence of casing	10
Presence of decoration	20
Presence of false door in undecorated tombs	10
Presence of serdab	10
lapis	17
Bronze	16
copper	15

⁷⁹REISNER, *sndm-ib*, 170.

diorite	14
basalt	13
gold	10
sandstone	12
granite	9
faïence	8
flint	7
carnelian	6
alabaster	5
limestone	4
wood	3
pottery	2
mud	1
sarcophagi	11
Statues	10
False doors	9
Offering tables / tablets	8
headrests	7
Canopic jars	6
Model tools	5
Vessels (jars, ewers, dishes ,etc)	4
amulets	3
Objects of adornment (necklaces bracelets ,etc)	2
beads	1

4- Title wealth relation

In an attempt to classify the OK officials into three broad categories that would serve as a basis for a comparison of their economic capacity, Kanawati⁸⁰ divided the title bearers under study into four categories: the viziers, the higher officials, the middle officials and the lower officials. A group of titles was identified to be characteristic to each category, so that an official holding one or more of those titles can be assigned to the corresponding category. The concept of Kanawati of categorisation for officials was used in the present study with some modifications. Since all viziers in CEE, except one⁸¹, bore the titles of higher officials listed by Kanawati, the category of viziers was merged with that of the higher officials in the following analysis. The groups of representative

⁸⁰KANAWATI, *Administration*, 15-28.

⁸¹The only exception is *wr-k3-b3 ikw* (G 2383) who does not bear any title belonging to the category of high officials of Kanawati.

titles for the categories were taken after Kanawati for the higher and lower officials. In the case of middle officials, however, several titles were added to the table of Kanawati⁸². Applying this classification to the 88 tombs of CEE whose owners had one or more titles, the outcome was: 25 tombs of viziers and higher officials, 25 tombs of middle officials and 38 tombs of lower officials (map 6.17).

Evidently the economic capacity of the tomb owners of the three categories is reflected in the sizes of their tombs since the mean of their tomb areas are 271 m², 91 m² and 60 m² successively. Graphs 6.5, 6.6 and 6.7 show the economic scores versus title scores for the tombs of the three categories. Here the presence of a connection between both values is clear, though the relationship is not entirely regular. The coefficient of correlation between the economic scores and the title scores for each category was calculated and the values acquired were ,38 in the case of viziers and higher officials, ,1 in the case of middle officials and ,39 in the case of lower officials. This outcome indicates a positive yet weak relationship between the two variables in each case. In other words, the wealth of the tomb of an official belonging to each of the three broad categories is not always in accordance with the predicted value based on his corresponding status. This variation in the relationship between title and economic capacity is most probably a reflection of chronology agreeing with the conclusions of Kanawati⁸³ who noticed that the resources of the lower and middle rank officials declined during the O.K., the latter group being unable to build a tomb from the reign of Unas onwards, the former from that of Pepy I. The same trend was found for the higher officials, including the viziers, whose resources declined as well with the advance of the Old Kingdom though the rule was interrupted by temporary rises.

5- Family wealths

To trace the changes in wealth of tomb owners who occupied CEE over time, it would perhaps be suitable to turn to the known family lines whose genealogy provides us with well established successions overcoming the problems of dating. In the following is the estimation of the wealth of the three known family lines in CEE.

Period of vizier office	owner-tomb	Substructure Type	volumeSuper	Sub volume	casing	decoration	serdab	Finds score	Titles score	Economic score	estates	dependants
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⁸²These are the titles: *sš ʿ nzwt hft-hr, hrp sš, šd sš, sš pr-ʿ3, imy-r3 is n pr-ʿ3, hnty-š mn-nfr ppy.*

⁸³KANAWATI, *Administration*, 78.

	<i>sšm-nfr</i> I (4940)	mastaba	1485	193	yes	yes	yes	57	65	587	10	22
	<i>r^c-wr</i> I (G5270)	mastaba	1235	104	yes	yes	yes	30	15	427	0	0
	<i>ph-n-ptḥ</i> (G 5280)	mastaba	1134	49	yes	yes	yes	45	10	358	0	0
	<i>sšm-nfr</i> II (G 5080)	mastaba	2220	199	yes	yes	yes	53	35	736	13	9
Isefi	<i>sšm-nfr</i> III (G 5170)	mastaba	1917	128	yes	yes	yes	19	85	570	14	35
	<i>r^c-wr</i> II (G 5470)	mastaba	476	47	yes	yes	yes	26	20	198	0	0
	<i>s3tw</i> (G 5480)	mastaba	372	34,4	yes	No	yes	14	25	152	0	0
	<i>sšm-nfr</i> IV (LG 53)	mastaba	900	68,88	yes	yes	yes	32	20	320	16	18
	<i>ḥtp-ḥr.s</i> (LG 54)	mastaba ⁸⁴		36,1+ 85	yes	yes	yes	32	10	108	0	0
	<i>ptḥ-ḥtp</i>	mastaba	269	123,5 3	yes	yes	yes	20	25	258	0	0
	<i>sšm-nfr-tti</i>	mastaba	668	58,7+	yes	yes	yes	24	10	255	6	8

As the above table demonstrates, tombs of *sšm-nfr* family show indications of large investments: they were all of large or medium sizes, each completely decorated, well cased and possessing a serdab. Brunner-Traut⁸⁶ noticed the similarities between the tombs of the *sšm-nfr* family in Giza. The typical style of this family includes the tumulus with inner chapel at the south end of the east face, in front of which is a court leading to a serdab. Junker noticed in addition several characteristic features of the burials of the *sšm-nfr* family, among others the trough coffins and the good standard of mummification. In spite of the plundered state of the shafts they still yielded enough to indicate that the dead of this family were remarkably well provided as well: *r^c-wr* I (G 5270) had a limestone sarcophagus and *ph-n-ptḥ* (G 5280) had a wooden coffin. Other members of the family possessed canopic jars, pottery vessels, headrests and objects of adornment in their burial chambers and statues in their serdabs. The richest burial among this family, in terms of grave goods, was doubtless that of *sšm-nfr* IV, in whose burial chamber 600 alabaster model jars and a large

⁸⁴The mastaba of *ḥtp-ḥrs* is so integrated into LG 53 that no separate calculation for superstructure volume could be made.

⁸⁵+ = The actual value is higher, but Junker provided only the dimensions of the burial chamber without the shaft.

⁸⁶BRUNNER-TRAUT, *Seschemnofers*, 15

number of pottery vessels were recorded. The economic scores for the members of this family were represented on graph 6.8 combined with the results from the evaluation of titles of the same tomb owners explained in the last chapter⁸⁷. The two lines on graph 6.8 represent thus the economical capacity and the administrative rank of the members of this family along time. It is evident here that the wealth of the *sšm-nfr* family had an period of flourishing during the lifetimes of *sšm-nfr* II and *sšm-nfr* III. After the later person the economic capacity of the family members decreased, maintaining though a relatively high standard in comparison with other tombs of the Sixth Dynasty.

Period of vizier office	owner-tomb	Substructure Type	volumeSuper	Sub volume	casing	decoration	serdab	Finds score	Titles score	Economic score	states	dependants
Early Fifth Dynasty	<i>k3-n-nzwt</i> I (G 2155)	mastaba	1197	76,7+ ⁸⁸	yes	yes	no	0 ⁸⁹	35	346	30	54
Niuserre	<i>k3-n-nzwt</i> II (G 2156)	mastaba	86,4	19,44	yes	yes	no	17	30	68	0	0
Niuserre-Unas	<i>k3-n-nzwt</i> III ⁹⁰ (G2156a)	mastaba	156,21	?	?	yes	no	?	5	41	0	0
Early Sixth Dynasty	<i>ir-n-r</i> ^c (G2156b)	mastaba	45	8,5	yes	yes	no		5	52	0	0
Middle Sixth Dynasty	<i>3nh-m-r</i> ^c (G2156c)	mastaba	51	1,86	no	yes	no		0	12	0	0

The decline in the wealth of *k3-n-nzwt* family was tremendous and rapid as many indications summarised by the above table express (graph 6.9). Already since the second generation the sizes of the mastabas of the members of this family decreased remarkably, occupying less than one tenth of the area of their apparently wealthy ancestor *k3-n-nzwt* I. The substructure volume sank constantly as well. Indeed the 17 m deep shaft and large burial chamber of *k3-n-nzwt* I can only be contrasted to the small shafts of *3nh-m-r*^c whose chambers were so tiny that they could only have housed the body of deceased in a contracted position. To cover the Northwest burial of G 2156 b (S 2147), *ir-*

⁸⁷See supra p. 193.

⁸⁸The burial chamber's dimensions are not given by Junker because the chamber was too irregular.

⁸⁹Burial chamber was plundered. JUNKER, *Giza* II, 141.

⁹⁰G 2156a is so briefly published by Junker, that many details about the mastaba are not clear JUNKER, *Giza* VIII, 177.

n-r^c did not shame to use an usurped false door belonging to a person named *hknw*⁹¹.

All mastabas of this family had decorated surfaces. Yet the quantity and quality of the decoration in each case is variable. The chapel of G 2155 is fully decorated, the execution of scenes showing prime artistic quality⁹². Here the 30 funerary estates and the 54 non-family dependants of *k3-n-nzwt* I are recorded. None of the preceding family members had a funerary estate, or a representation of an individual employed in their service rather than the family members. In G 2156 it is only the two false doors and the space in-between them on the west wall of the chapel that are decorated. The surface of those false doors was not smoothed as usually required and the red guiding lines were still visible indicating that the work remained unfinished. The amount of decoration in the tomb of *k3-n-nzwt* III (G 2156a) is not known accurately since only the lower course of the mastaba was preserved but it seems likely that only the space between the false door and the north wall was decorated. Yet it appears that *k3-n-nzwt* III still possessed some considerable resources since he completed the tomb of his father *k3-n-nzwt* II as the inscriptions indicate.

The impoverishment of the family progressed sharply since the fourth generation. *ir-n-r*^c leaned his mastaba (G 2156 b) on the north wall of G 4970 and constructed no interior or exterior chapel. Instead two decorated false doors were inserted on the exterior east wall of the mastaba, but no enclosing wall was added for the cult area until his son *3nh-m-r*^c joined his mastaba to the east of his father's. It was only then that a chapel was created naturally between the two mastabas, needing no more than a roofing and a door at the entrance, which was flanked by two representations of *3nh-m-r*^c.

For the case of *sndm-ib* family our calculations concerning the volume of tomb substructure face a major obstacle. Attributing the sloping passage shafts of type 9 in the *sndm-ib* complex to a particular superstructure is problematic since the opening of the shaft is usually not located within the body of the mastaba but on its east side. Reisner⁹³ and Brovarski⁹⁴ reached however the following attributions, on whose base the calculations in the below table were carried out:

G 2370 B⁹⁵: belongs to *sndm-ib inti* (G 2370)

G 2378 A: belongs to *sndm-ib mhi* (G2378)

G 2385 A: belongs most probably to *hnm-inti* (G 2374)

G 2387 A: belongs most probably to *pth-mr-3nh-ppy*⁹⁶.

G2382 A: belongs to *nhbw* (G 2381)

⁹¹JUNKER, *Giza* III, 146.

⁹²JUNKER, *Giza* III, 143.

⁹³REISNER, *sndm-ib*, 125.

⁹⁴BROVARSKI, *Giza* VII, 1.

⁹⁵Reisner mentioned once that G 2378 A was the shaft of type 9 (REISNER, *Giza* I, 521), and once that G 2378 B was the shaft of type 9 (REISNER, *sndm-ib*, 131). the last is represented on my map.

⁹⁶a brother of *mry-r-mry-pth-3nh nhbw* (G 2381)

G 2381 A: belongs to *impy* (G2386 C 1)

G 2381 C: belongs most probably to *s3bw-ptḥ ibbi* (G 2386 C 2).

Dating	owner-tomb	Substructure Type	Superstructure volume	Substructure volume	casing	decoration	serdab	Finds score	Titles score	Economic score	estates	dependants
Later Isesi	<i>sndm-ib inti</i> (G 2370)	mastaba	2125,3	72,4 1	Yes	yes	yes	82	115	619	36	24
Early Unas	<i>sndm-ib mḥi</i> (G 2378)	mastaba	1164,42	97,1	Yes	yes	yes	27	100	396	24	7
End Fifth Dynasty	<i>ḥnm-inti</i> (G 2374)	mastaba	265,56	114	Yes	yes	yes	17	120	244	18	3
Late Fifth Dynasty	<i>k3i-ḥr-ptḥ Ftk-ti</i> (G 5560)	mastaba	431,44	87,4 2	No? ⁹⁷	yes	yes	0	50	203	0	0
Pepy I	<i>nḥbw</i> (G 2381)	mastaba	453,02	121	No?	yes	yes	24	100	214	0	2
Pepy I	<i>mr-ptḥ-ḥnḥ-ppi</i> ⁹⁸ (G2385 ?)	chapel	473,76	68	No?	yes ⁹⁹	yes	11		183	0	0
Mid Pepy II	<i>s3bw-ptḥ ibbi</i> ¹⁰⁰ (shaft G2381 C, chapel G 2386 C 2)	chapel	29,4	57,2 4	No?	yes	yes	70	90	153	0	0
Mid Pepy II	<i>impy</i> (shaft G2381 A, chapel G 2386 C1)	chapel	10,8	25,5	No?	yes	yes	70	70	117	0	0
End OK	<i>wr-k3w-b3 ikw</i> (G 2383 C1)	chapel	12	6,07 ¹⁰¹	yes	Only false door	no	35	45	48	0	0

⁹⁷No? = The superstructure is destroyed to a degree that would not allow a judgement about the existence of the casing.

⁹⁸ Brother of *nḥbw*, represented in G 2381.

⁹⁹G2385 was badly denuded but Reisner believed it must have been wholly or partly decorated, *sndm-ib*, 173.

¹⁰⁰Son of *nḥbw*, represented in G 2381.

¹⁰¹This is the volume of the intrusive shaft G 2370 b, in which Brovarski believed *wr-k3w-b3 ikw* was buried

The above table documents the volumes of the superstructure and substructure for the known *sndm-ib* family tombs. Worthy of attention is that both values tend to decrease in the later generations of the family. The last four known men of this family were apparently not in the position to construct complete mastabas for themselves. Instead, they built small offering rooms which had rather humble dimensions. Six of the tombs in the above table were fully or partly decorated. Since however only scattered blocks of decoration survived in some cases, the amount of decoration is hard to determine in several of these tombs. It is nevertheless evident that in the better preserved mastabas of *sndm ib inti* (G 2370) and his two sons *sndm-ib mḥi* (G 2378) and *ḥnm-inti* (G 2374) all the available wall surfaces in chapels had originally been decorated, except for the great hall of pillars in the case of G 2370102. The mastaba of *kA-xr-ptH ftk-ti* (G 5560) is on the other hand badly destroyed, with only some recognisable traces of a bird hunting scene¹⁰³, but the burial chamber of his main shaft G 5560 A has a decorated scene on its east wall. According to Brovarski¹⁰⁴, the two chapels of *impy* and *ibbi* (G 2386 C1 and G 2386 C 2) are the source for the remaining reliefs from the serdabs of *impy* and *ibbi*, though Reisner¹⁰⁵ evidently thought that those stones were derived from the chapel of G 2385. The decorated walls of G 2381 were demolished completely but many stones were found in confusion in the holes dug in the pavement of the great court of the *sndm-ib* complex and in the debris of the mastaba itself. From these blocks it seems that the chapel of G 2381 was completely decorated. G 2383 C 1 is unique in many ways. *Wr-k3w-b3 ikw*, though a vizier, had to be content with a chapel of humble size whose surface, except for the false door, was undecorated. A serdab and a shaft were also absent from G 2381 C1, whose owner was apparently economically so incompetent that he came to be buried in a small intrusive shaft dug into G 2370.

Representing the economic scores of this family on a line graph (graph 6.10), the decline in the economical capacity of its members is striking as early as the second generation being represented by the sharp slope of the line. The drop in the family wealth between the second and third generation is demonstrated also by other facts which were not included in the cost matrix. *sndm-ib inti* and his two sons possessed each large numbers of funerary estates while no later member of the family acquired any. Even the number of estates in the three tombs (36, 24 and 18 respectively) decreases evenly. After the third generation of this family the decrease in tomb wealth became less severe yet it continued on a steady rate until the last known generation. Graph 6.10 demonstrates that the decline in manifestations of financial ability was parallel with the decrease in the number of functions held by the family members as if the former is responsive for the later. That the relation

¹⁰²BROVARSKI, *Giza VII*, 37.

¹⁰³REISNER, *sndm-ib*, 47.

¹⁰⁴BROVARSKI, *Giza VII*, 16.

¹⁰⁵REISNER, *sndm-ib*, 173.

between the function and the financial ability is especially sensitive is demonstrated by the slope of the two lines for the three tombs G 2374, G 5560 and G 2381. The section of the financial ability line here drops evidently in the middle but raises at the end which corresponds with the shape of the titles line.

The values of economic scores of the members of the three above discussed families were placed on a timeline for the purpose of comparison (graph 6.11). Even when values of the three families fluctuate at different reigns, it became obvious that the three lines share a main common feature: they all end at much lesser values than their beginnings. In other words the decline of economic capacity happened in principal to all, though in variable degrees for each case. The difference between the start and the end scores is the largest in the *sndm-ib* family, probably for the simple reason that the last known member of this family *wr-k3 ikw* (G 2383 C1) dates to the latest period in OK, a period during which the resources of all higher officials declined remarkably.

Chapter Seven
A GIS-based Transportation Model in CEE

Land roads¹ in Giza

Land roads in ancient Egypt can be classified into two categories according to their construction method: those which originated from no particular plan and those which were actively designed. To the former category belong the *Begehungshorizonte* and paths, and to the later streets and routes². Actual examples of man made roads in Giza were attested in the workmen settlement to the south-east of the valley temple of Khafre where three streets were discovered³. 5,2 m wide, these streets were broad by ancient standards. The main street, covered by a bed of limestone and marl gravel, would perhaps be the first ancient paved street in the world. While these streets allowed ancient workers a direct east-west crossing of the Gallery Complex, the access to outside the complex was provided by another route which led south on a path starting at the open gateway in the Wall of the Crow.

On the other hand, no man made streets or routes are known in the cemeteries of the Giza plateau either because their existence was not recognized in the course of archaeological excavations, or because the records of such features are still unpublished. Within the limits of our current knowledge, it could be assumed that the road network in the Giza cemetery consisted of natural routes which were created by the constant passage of men and animals which compacted the ground and clearly marked the way . The tracks of those routes would have been bordered by the existing buildings in the occupied areas of the cemetery.

The present study is concerned with modeling a network of routes for the Giza plateau, concentrating our analysis on the area of CEE. The approach, theory and results described below are illustrative. Clearly much work needs to be done before we have an understanding of movement mechanisms in ancient cemeteries.

1- Methodology

Transportation networks are modeled in ArcGis using network datasets. Since there are no multiple-level⁴ roads in the present model, a simple shapefile-based network dataset was sufficient for the current study. The road network was represented by a large grid of 2 x 2 m

¹ Throughout this chapter, the term road was used as a general name for all land ways: streets, paths, routes etc.

² KÖPP, *Sokar* 18, 31; PARTRIDGE, *Transport in ancient Egypt*, 80; FORBES, *Notes on the history of ancient roads* , 57

³ LEHNER, *Giza reports* I, 42-44.

⁴ Multiple level roads occur in urban areas where bridges, streets and tunnels interact in the same location.

squares along the surface of the Giza plateau around the Khufu and Khafre pyramid complexes, an area about 1 km² in size, covering the WCE, the ECE and the potential quarry sites.

1-A Creation of cost surface

Two locations which are at the same linear distance from a source location may not be equally easy to reach: for one it may be necessary to walk uphill, while there may be only flat terrain to cross to reach the other. Movement can also be affected adversely by barriers such as fences, or cultural no-go zones, or positively by the availability of roads. Consequently, it was necessary to develop models of the time taken and cost incurred in reaching any given target location from a source location rather than just the distance. ArcGis offers the facility of generating cost surfaces. By using the result of a cost surface algorithm, the program calculates the least-cost pathway between any given location in the landscape and a wished destination.

In the current study cost was modeled by:

1- The metric distance of the length of roads

2- Multi-criteria time measures which were computed according to:

A- The length of the road,

B- The gradient slope of the road derived from a Digital Elevation Model (DEM).

C- The speed of humans: The walking speed of humans varies considerably depending on terrain slope, nature of walking surface and individual physical conditions like height, weight, age and gender. The average human speed is estimated however to be 106 m per minute⁵ and this value was entered as an input in the current model.

1- B Representation of chronology

Integration of chronology within the road network model was of utmost importance recognizing the fact that earlier tombs must have formed barriers for the transport of materials for the later constructions. The results obtained from the last chapter concerning dating of tombs were invested in this context since the need of a numerical symbolization for tombs can be fulfilled by the dating seriation graph 3.1. Produced earlier in this study, that seriation graph provided a numerical order for 237 tombs of the CEE. Though it cannot be claimed that the conclusions obtained from that seriation attempt are final or perfectly correct, this serial

⁵ 6,4 kilometer per hour= 4 miles per hour.

arrangement of tombs was taken here at face value because of the absence of any other comprehensive chronological framework which is an essential requirement to carry out this type of study. Since such an order can only be tentatively indicative, the 237 tombs were classified into 6 classes according to their position on the seriation graph. Each was assigned a numerical code. It was relatively unproblematic later to represent the dating of the other large features of the Giza plateau following this same numerical order as demonstrated in the following table.

Feature	Numerical code of dating class
Pyramid complex of Khufu	1
Main mastabas of WCE except those of CEE (a group of 99 mastabas)	2
Pyramid complex of Khafre and the and southern wall of WCE ⁶	3
The first 26 mastabas of seriation graph	4
The following 48 mastabas of CEE on seriation graph	5
The following 48 mastabas of CEE on seriation graph	6
The following 48 mastabas of CEE on seriation graph	7
The following 47 mastabas of CEE on seriation graph	8
The following 20 mastabas of CEE on seriation graph	9
All other secondary tombs of WCE, CEE and ECE	10

⁶ The position of this feature in chronology was taken here after the opinion of Reisner who believed that the CEE was constructed between the middle reigns of Khafre and Menkaure, see *supra* p. 97. It was also agreed that the southern enclosure of WCE was built during the reign of Khafre. LEHNER, *MDAIK* 41, 1985, 124.

The 190 tombs of CEE which were not included in the seriation graph in addition to all the secondary tombs of WCE and ECE were given the code 10 as a dating class attribute. Such a code was assigned to those tombs only for the purpose of differentiation but was not used during the analysis as a dating class because the last mentioned tombs do not represent a homogeneous group. Whenever possible, those tombs were added individually as barriers on the network analysis layer. Intrusive shafts in the streets of CEE were also added as barriers during the analysis. A selection by location was made for the roads intersecting with the tombs of each dating class and each road was assigned the same numerical code as the corresponding tomb. A parameter called (dating of tomb) was assigned to the restriction attribute in the network dataset properties. Other roads of the cemetery which do not intersect with any tombs were given the code 11 to indicate that they remained free of occupation. The restriction evaluator in the network dataset properties was then defined by the function: *dating class < dating class of tomb*. Before performing each operation of the network solver, the numerical code of the dating class of the tomb being considered as the destination in the analysis was entered manually in the parameter box.

2- Transportation of tomb construction materials in CEE

Even long before the evolution of the modern location theory⁷, the preliminary evaluation of the economics of energy consumption must have played a central role in decisions concerning choosing the location of tombs. Energy consumption during tomb construction included the quarrying of materials, the costs for transportation and the effort expenditure related to the digging of the substructure and the building of the superstructure. While the effort expenditure was dealt with in a previous chapter, the current analysis focuses on analyzing the cost and energy consumption associated with the transportation of stone from an optimal quarry to the construction sites in CEE.

The transportation of stone in ancient Egypt was an enormously laborious task. What is known about how stone blocks were transported has been deduced from a few reliefs, tool models and construction ramp remains. Apparently, and based on the great number of

⁷ Location theory is concerned with the geographic location of economic activity; it has become an integral part of economic geography, regional science, and spatial economics. Location theory addresses the questions of what economic activities are located where and why. Location theory rests — like microeconomic theory generally — on the assumption that agents act in their own self interest. Thus firms choose locations that maximize their profits and individuals choose locations that maximize their utility.

representations, sledges pulled either by men or oxen were the main instrument for the transportation of heavy objects in ancient Egypt. Most representations of sledges show the transport of funerary equipment, such as *k3* statues, coffins, canopic boxes, and other shrines⁸, but there are also representations of the transport of building materials⁹. A graffito in Tura dating to the New Kingdom depicts the transport of stone on a sledge drawn by oxen.

It has been estimated that a ratio of three men per ton would be required for moving sledges over flat surfaces¹⁰; nine men per ton would be required for moving loads up a 9° slope. To what extent animals could have been used for pulling sledges is unknown. A relief from the quarries of Tura-Ma'asara¹¹ represents the hauling of a block, the size of which may be estimated to have been 1×1×3 meters (about 5 tons), on a sledge pulled by three pairs of oxen guided by three drivers. Examples from a modern quarry¹² show that twenty-eight animals could be properly arranged and guided. They would easily have had a pulling force of 150 to 200 tons.

On horizontal surfaces, multiple parallel tracks overlaid with wooden planks and rollers were also used. Since rollers are not easy to operate on uneven or soft ground, a double row of skid poles used to be inserted as tracks in the direction of movement. Arnold¹³ concluded that the use of rollers and skid poles was restricted to work under such special conditions, whenever transport sledges had to be left behind. Friction was the main obstacle during transportation of stones, as heavy blocks would create a ground pressure over each square centimeter of their bases, and a greater force would be required to overcome the friction. Friction could however be reduced to nearly zero by wetting the track with a lubricant. Ancient scenes show that the surface of the ground was turned slick by pouring small amounts of water on it¹⁴.

Few comparable examples of roads that linked quarries to construction sites or to stone working areas have been discovered in Egypt. A rare paved Old Kingdom road connected the Basalt quarry of Gabal Qatrani to the lake Moeris¹⁵. Perfectly straight and 2,1 m wide at the best preserved area, the road was covered with slabs of sandstone and limestone and even some logs of petrified wood. This pavement facilitated the movement of sledges loaded with basalt stones along the 11, 5 km long road from the quarry to the quay for shipment by barge

⁸ FISCHER, *JEA* 67, 166, fig. 1; NEWBERRY, *Bersheh i*, pl. 15; BADAWY, *MIO* 8, 325, 332.

⁹ G. Goyon, *BIFAO* 69, 11-41, pls. 3-5; Fischer, *JEA* 61, 33-34, fig. 2.

¹⁰ ARNOLD, *Baukunst*, 265.

¹¹ DARESSY, *ASAE* 11, 263-265.

¹² From observations made in the marble quarries of Carrara in Italy: CONTI, *Marble*, figs. 134-137, 245, 248.

¹³ ARNOLD, *Stone Masonry*, 256

¹⁴ NEWBERRY, *El Bersheh i*, pl. 15; *Badawy, MIO* 8, 325-332.

¹⁵ HARRELL and BOWN, *JARCE*, 71-91.

across the lake and on the Nile to construction sites. The transport network at the Roman quarry Mons Claudians has been studied by Maxfield and Peacock¹⁶ who noticed that the stone would have been brought down from the quarries to Wadi level using slipways¹⁷, which were usually steep generally taking the line of the least resistance from the quarries to the Wadi floor. Numerous cairns, whose purpose is unclear, were placed at regular intervals along the route. Some slipways terminated with loading ramps. Footpaths are another feature of landscape at Mons Claudians. They zigzag up steep mountain sides leveling out when the desired height has been reached. They are substantially built and often reverted and in many cases have been used to transport porphyry.

2-A Determination of the optimal quarry for CEE

Since all network analyst solvers require two main locations as inputs, the origin and the destination, one or more quarries should be determined as the provider for stones for the CEE. There are a number of potential quarries located in several sites on the Moqattam formation (map1). The below listed quarries have been observed by Reisner¹⁸ and Lehner¹⁹.

2-A-1 Quarries located in the area to the North of Khufu pyramid in the ECE

1- Just north of the First Pyramid the edge of the rock platform can be followed roughly. Reisner believed that this edge had been quarried back, though the scarp was covered with a mass of masons' debris thrown out when the pyramid enclosure was cleaned up after the construction of the First Pyramid. Lehner²⁰ has questioned the existence of a quarry in this location because the rock forming the nummulite bank is not suitable for extracting building stone.

2- Following the edge of the cliff around to the east, an indeterminable amount of stone has been quarried away and the face of the rock scarp was taken by rock-cut tombs, generally of the Fifth and Sixth Dynasties.

3- Directly in front of the great pyramid, from near the northern small pyramid of a queen to the edge of the cliff, runs a quarry which has been partly filled up with the masonry foundations of the Khufu causeway, and partly occupied by mastabas (G 7810 and 7820) and the tombs of funerary priests of the Sixth and Fifth Dynasties.

¹⁶ PEACOCK and MAXFIELD, *Mons Claudianus*, 259-61.

¹⁷ Man-made, steeply sloping road used for moving of stones to a lower area.

¹⁸ REISNER, *Giza I*, 12.

¹⁹ LEHNER, *MDAIK* 41, 109-143.

²⁰ LEHNER, *AFO* 32, 148.

2-A-2 Area South of Khufu pyramid and East of Khafre pyramid

4- The area to the south of Khufu pyramid (B 24²¹), beyond cemetery GIS. While this quarry may have been started under Khufu, it is probable that it was exploited under Khafre.

5- A quarry in the south east corner of the Khufu pyramid (B 9- C 12) for supplying the construction of the ECE. Most of this quarry must have been excavated under Khafre, but it is possible that the eastern half could have been begun under Khufu, thus it might have supplied the construction of the great pyramid as well.

6- A large basin quarry (B10) located 600 to 300 m south of Khufu pyramid in the western part of the central field. The quarry measures 230 east-west at the widest part, and at least 400 m north-south. The depth and size of this quarry allows the conclusion that it was the source of the local limestone used for the building of the Khufu pyramid.

2-A-3 In the WCE

No quarries in the WCE were noticed by Klemm during his survey 1986-1987 because they were either overbuilt by secondary tombs or filled by debris²². According to Reisner, however, two quarries are located on either sides of the south enclosing stone wall of the WCE:

7- The old Khafre quarry to its south.

8- Another quarry examined by Schiaparelli to its north. The exact borders of the Schiaparelli quarry are not clearly published. Reisner²³ mentioned however often that it is located to the west of G 6000 in the space which would have been occupied by the extension of the three southern lines of G 4000.

9- A small basin quarry about 170 m west of Northwest corner of Khafre pyramid (B 8), measuring about 140 (NS) x 80 m (EW)²⁴. It appears to date earlier than Khafre's reign because the Northwest corner of the so called workmen barracks is partially built over this quarry. It is assumed that this installation is contemporary with the building of the Khafre pyramid²⁵.

2- B Origin- Destination Cost Matrix

²¹ Numbers between brackets refer to the isometric projections made by Lehner, MDAIK 41, figs. 3B and 3C.

²² KLEMM, *Steine*, 54.

²³ REISNER, *Giza I*, 13, 14, 25.

²⁴ Another nearby quarry has been described by Lehner (MDAIK 41, fig. 3A) by being located to the west of A 8. Since point A 8 is located on the Maadi formation, this must be a mistake of Lehner.

²⁵ MARAGIOGLIO and RINALDI, *Piramidi Menfite*, 96-7, 132-133.

Because network solvers accept only point shape files as inputs, the above mentioned potential quarries were represented on the map by points located at their centroids. To determine the optimal quarry for the tombs of CEE in terms of the minimum effort used for the transportation of stones, an Origin-Destination cost matrix was created. The cost factor which was used in this case was the metric length of routes multiplied by the slope of land. The network solver takes thus three factors into consideration while performing its calculations: the proximity of the quarry to the stone delivery destination, the barriers existing between both and the slope of the terrain. Those factors are the only indicators of effort of the transportation of stones available for the current research. A more precise estimation of effort would require a study of the nature of the ground in different areas of the Giza plateau and should involve practical experiments to determine the friction of wooden sledges on sand per square meter and the local factors affecting the transportation process.

The Origin- Destination Cost Matrix is actually a categorization of the potential destinations for each origin according to the effort invested in reaching them. The output of this tool can be represented visually to demonstrate which destination is to be reached from the given origin using the least possible effort and vice versa. This operation was carried out for tombs of CEE categorized to the six dating classes listed in the above table. Map 7.1 shows the matrix represented visually by lines²⁶ for the first 26 tombs of CEE. It could be noticed that the least effort is associated with quarries number 1 and 8. A similar result was obtained when performing the same operation with the remaining five dating classes of CEE. The use of more than one quarry simultaneously is possible. Reisner once remarked: It is obvious that the various beds of stone were being worked practically simultaneously during the construction of the nucleus cemeteries²⁷. The means of effort estimation for the transportation of stones from quarries 1 and 8 during the different dating classes were represented on a line graph (graph 7.1). The difference in effort estimation between the two quarries in the first phase leads to the conclusion that that quarry number 8 was used as the source for stone for the first 26 mastabas of CEE. For stages 2 through 6, it could be noticed that the effort estimation to reach both quarries was in the same range so that it probably did not cause a significant effect on the decision concerning the choice of the source of stone. Archaeological evidence of the use of quarry number 8 exists in a form of a transportation ramp²⁸. That rubble ramp traverses the CEE coming from the space between cemetery G 4000 and the great southern boundary

²⁶ The lines on map 7.1 do not represent routes, they only represent the relation between the origin and source in means of the given effort factor.

²⁷ REISNER, *Giza* I, 38.

²⁸ REISNER, *Giza*, I, 69 note 1, 82.

wall of WCE passing diagonally across the unoccupied site of G 4810, along the back of G 4920, between that core and 4930, eastward between G 4920 and 4930, over the northern addition to G 5020, under the later mastaba G 5131 (built against the southern end of G 5130) and so to the back of the large mastaba G 5230. According to Reisner, this ramp was later in date than the three En Echelon lines, and previous to the construction of the later mastabas G 4811, G 5131, and G 5230. The destination of the transported stone is obscure, though Reisner suggested it might be mastaba G 5230, a mastaba which belongs to dating class 2 in our proposal. When an Origin-destination cost matrix was created for this tomb entering its dating class as a parameter, the results assured that quarry number 8 is the best reachable source of stone, in terms of least effort (map 7.2). Using the best route tool from a point in quarry 8 to the back of mastabas G 5230 produced an itinerary for the transportation of stones similar to the real road described by Reisner (map 7.3). The difference between the two roads is most probably due to the undated secondary mastabas between the main cores of cemetery G 4000, whose dating is beyond the scope of this study. It seems though possible that the space between cemetery G 4000 and the southern wall of WCE was free of occupations at the time of the construction of G 5230, while the spaces the fifth and sixth rows of G 4000 were already occupied by secondary mastabas standing nowadays in that location.

Graph 7.1 demonstrates that the effort needed to reach quarries 1 and 8 increased obviously over time. This increasing trend indicates that it became more laborious to transfer stones for the construction of tombs as the cemetery grew, due to the deviations from the direct least cost road as the transporters of stones had to take account of the existing constructions.

3- Accessibility of tombs in CEE

Accessibility refers to the ability of people to reach the destinations which they must visit in order to meet their needs, or which they desire to visit to satisfy their wants. The concept of accessibility can also be extended to include the transportation of materials and items to the desired destinations. The ability to reach different destinations is affected by many factors including the road network, travel behavior preferences, patterns of land use, site development and the availability of transportation means for larger distances. The interaction of these factors in CEE must have created favorable or less desirable accessibility conditions. Good accessibility conditions were of course of importance since the early phase of tomb site selection until long after the death of their owners since they affected many operations: the transport of funerary equipment during the burial ceremony, the movement of cult personnel and the transportation of materials necessary for cult maintenance

A consideration for the typical scenario of the transportation process which took place during the installation of the body and the funerary equipment would be useful in this context. Our knowledge about the conveyance of the body of the deceased to the burial location is provided by tomb scenes of the Old Kingdom, as well as by the more elaborate scenes of the same type dating to the New Kingdom²⁹. Bolshakov³⁰ presented a list of 16 tombs containing all attested Old Kingdom burial scenes. Successive performances during the burial rituals included many transportation intervals, normally beginning on the east bank of the Nile and crossing over on ferries to the cemeteries on the west. The next step was carrying the coffin after disembarking it from the ship on a bier to a special structure called *ibw*³¹, where the purification rituals took place. Following purification the body would be taken to the embalming workshop *w^cbt*, where, assumingly, it was left for a period of time³² until the mummification was accomplished. In more detailed scenes, the now mummified corpse would be placed upon a sledge covered by a shrine and drawn by oxen to the tomb, with a second sledge following to transport the chest containing the viscera³³. The adequate route capacity to handle large numbers of pedestrians at one time must have been considered an advantageous quality since the funeral procession was accompanied usually by large crowds of people including mourning women, a number of servants carrying items of tomb-furniture and a detachment of several officials and priests. On the arrival at the tomb, the bier would be greeted by ritual dancers and by the lector priest. A large proportion of the materials transported during private funerals consisted of large items such as beads, chairs and furniture-boxes. Cosmetic equipment, toys, musical instruments, tools and weapons are also known to have originated from tombs. Even long after the burial took place accessibility of the tomb was essential to maintain the cult. Inscribed offering formulas attested from the Fourth dynasty onwards presupposed, realistically or otherwise, that people would visit the necropolis and would read and activate the offering formulae³⁴. Regular real offerings on the other hand were supplemented by visits of family members or cult personnel to the tomb.

²⁹ SPENCER, *Death in ancient Egypt*, 51

³⁰ BOLSHAKOV, *GM* 121, 31-54.

³¹ HASSAN, *Giza IV*, 69-72.

³² On the period between death and burial: WILSON, *JNES* 3, 201ff.

³³ Old Kingdom scenes: DAVIES, *Deir el Gebrâwi I*, pl. 10, 7. and another scene of a funeral procession on the papyrus of *ḥn-nfr* 19th dynasty: SPENCER, *Death in ancient Egypt*, pl. 7.

³⁴ BAINES AND LACOVARA, *Journal of social archaeology* 2(1), 12.

In the following we will focus on measuring the revealed spatial accessibility³⁵ of different areas in the CEE during the six dating classes to measure the variations in access to and from tombs³⁶.

Among the approaches which have been developed in various disciplines to set accessibility measures are the floating catchments area³⁷ and the gravity-based methods³⁸. The gravity based method seems to be more theoretically sound than the two-step floating catchments area because it reflects a continuous deterioration of access in distance, rating a nearby destination more accessible than a remote one³⁹. The equation model which was used in the present study is:

$$A_i^H = \sum_{j=1}^n S_j d_{ij}^{-\beta}$$

Where S_j is the number of accessible tombs at location j , d_{ij} is the travel cost (defined here by distance) between a pedestrian location i (a fixed point in the southeast corner of CEE) and tomb location j , β is the travel-friction coefficient, and n is the total number of tomb locations. Applying the last mentioned method as an accessibility measure for the present case requires the definition of a key parameter: the travel-friction coefficient β . A larger travel-friction coefficient β -value implies that persons are more discouraged by longer travel times in visiting tombs and vice versa. Since finding the actual value of this parameter requires travel data which are inaccessible for the current study, reasonable values for β ranging between 1 and 2 were defined, and sensitivity analysis was conducted by experimenting with those values. The final results presented for the current analysis were derived using a travel friction coefficient value of 1. That value did not only simplify the calculations required for the analysis but also expressed the statement of the above mentioned equation directly and in a simple manner: accessibility of different areas in the cemetery decreases as distance from

³⁵ For types of accessibility: WANG, *Applications in GIS*, 78.

³⁶ For accessibility study cases in archaeology using GIS: VAN DER ELST, 'Low budget geospatial methods', 465-471.

³⁷ RADKE and MU, *Geographic Information Sciences*, 6(2), 105-112.: LUO and WANG, "Measures of spatial accessibility", 865–884.

³⁸ HANSEN, "How accessibility shapes land use", 73-76; JOSEPH and BANTOCK, "Measuring Potential Physical Accessibility", 85-90, SHEN "Spatial technologies", 447- 464.

³⁹ On examples of the applications of gravity models see: MORYADAS, *The Geography of Movement*, 182.

origin increases and as accessible tombs in each dating class become less in number⁴⁰. This simple accessibility measure emphasizes the proximity of the destination to the origin⁴¹.

The results obtained from the gravity -based method for the accessibility index for CEE during the 6 dating classes were represented on graph 7.2. To avoid misunderstanding the graph it is necessary to stress that the values calculated for the accessibility index are dependent on the number of tombs built during a dating class. In other words the graph is partly representative for the number of accessible tombs of each dating class along the history of the cemetery. A common observation about the 6 dating classes is the decline in the accessibility condition for their tombs over time. While this decline was drastic for the last 5 dating classes, the first dating class, that is the first 26 mastabas built in the cemetery, preserved for a long period a good accessibility level. Most of these large mastabas could be approached until the last phase of the cemetery development.

The results of the above illustrated accessibility index remain however tentative, since they are sensitive to many parameters whose determination is beyond the means of a theoretical study. The dependency on the tentative chronological frame is yet another weakness for such an approach. It may be more visually indicative to represent the tombs of CEE as accessible versus inaccessible during the last phase of the cemetery: i.e. in their present condition. To achieve this, the polygon of each tomb was transformed to four points representing its corners. The intrusive shafts of the cemetery were uploaded as barriers and dating class 11 was entered. A network solver was then run and results were represented on map 7.4. Since each tomb is represented by four points, it is possible to determine from which direction each mastaba was accessible.

3- A The journey of a priest

Let us now reconstruct the walk of a priest named *nfr-mḥi* (G 2391) through the CEE. *nfr-mḥi* was a *ḥm-k3* priest who belonged to the second generation of a family whose members were in the service of the great *sndm-ib* family. It is reasonable thus to assume that *nfr-mḥi* visited the CEE on a regular basis to maintain the cult of his patrons and of his own ancestors. No textual evidence exists that would allow us to determine exactly the tombs of *sndm-ib* family for whose service *nfr-mḥi* was engaged. Nevertheless it will be assumed here that he visited the tombs of this family whose owner's identity is well attested (G 2370, G 2378, G 2374, G

⁴⁰ A similar version of a gravity-based model is discussed by CROMLEY and MCLAFFERTY, *GIS and Public Health*, 233 - 258.

⁴¹ BRABYN and GOWER also used minimum travel distance to the closet service provider to measure accessibility: BRABYN and GOWER, 'Mapping accessibility', 289–307

5560, G 2381, G 2381 A). In his capacity of a *ḥm-k3*, *nfr-mḥi* would bring offerings and perform rituals such as burning incense and pouring libations, carrying out the rites of ‘removing footprints’ and ‘making glorification’ as scenes which depict the funerary cult rituals during the Old Kingdom demonstrate⁴².

The journey of the Giza plateau visitors must have started in the valley, where many peasant villages would have been located. In his reconstruction of the Giza plateau landscape, Lehner⁴³ proposed the existence of two conjectural villages on a topographic high at the site of Nazlet El Batran, about 1 km to the southeast of the valley temple of Khafre. Presumably the visitors had to cross water bodies as well in their journey to the Giza plateau. The Old Kingdom scenes frequently show the funeral cortège crossing a body of water⁴⁴. In the proposal of Lehner there are many water canals to the east of Giza plateau. Even without this illustrated reconstruction of the landscape at Giza, Wilson noticed long ago that it was impossible to go very far in Egypt without crossing some body of water⁴⁵. A priest who served a tomb in the WCE would thus have travelled from his village in the valley crossing one or more water canals. He would then walk uphill the slope of the plateau passing by the ECE, than the GIS cemetery, until he reached his target in WCE. A point in the site of Nazlet El Batran was taken to be the origin of the journey in the present analysis. For the visual illustration of the proposed route, the 3 D Isometric projection of the Giza plateau executed by Lehner⁴⁶ was mixed with an ArcScene view (pl. 7.1). To simplify the ArcGis operations during the analysis, the road was modeled by a single line which was linked to the road network of the plateau.

nfr-mḥi would thus approach the CEE from the south eastern corner. That area, being less occupied with constructions, was most probably more adequate for pedestrians who visited the cemetery as a whole. Though *nfr-mḥi* himself would reach the cemetery walking, as the major means of getting around for short distances in ancient Egypt was by foot, he would have also brought some objects and offerings which require a beast of burden. For the transportation of objects during the Old Kingdom, donkeys were utilized. They would be loaded with burdens divided into equal portions on either sides of its saddle as portrayed by numerous tomb scenes⁴⁷. *nfr-mḥi* probably witnessed the cemetery in its final stage of development. The cemetery would have then been fully occupied by tombs in an appearance

⁴² For examples of such scenes: FITZENREITER, *OLA* 103, 67–140.

⁴³ LEHNER, *MDAIK* 41, 137, C25 and C26.

⁴⁴ For instance: MACRAMALLAH, *Le mastaba d'Idout*, 8; DUELL, *The mastaba of Mereruka* pl. 130.

⁴⁵ WILSON, *JNES* 3, 205.

⁴⁶ LEHNER, *MDAIK* 41, fig 3C.

⁴⁷ JANSSEN, *Egyptian household animals*, 37.

similar to its current state, though there would have been of course less intrusive shafts intruding into the streets here and there. The destinations were represented by points located in front of the entrance to the seven chapels⁴⁸ of the six above mentioned tombs of the *sndm-ib* family and the mastaba of the *nfr-mḥi* family (G2391). Maps 7.5, 7.6 and 7.7 demonstrate the itinerary of the journey during different dating classes. With dating class 9 the course of the route was direct represented almost by the linear distance between the destinations. The first stop in *nfr-mḥi*'s journey would be the tomb of *fik-ti* (G 5560). The priest would head then to the complex of *snd-ib* where he would visit the other 5 tombs of the family. He would finally proceed to his last stop: the tomb of his own family (G2391). As time passed, the sons of *nfr-mḥi*, who were most probably responsible for the service of the *sndm-ib* family tombs as well, had to travel a longer distance to reach the same tombs. Map 7.6 demonstrates the route between the same stops when dating class 10 was used. Now the visitors had to make several detours taking turns around the new tombs. Their walk would even take them outside the limits of CEE, going as far as the eastern border of mastaba G 2000 to reach their target.

The increasing complication of the route must have continued until it caused the *sndm-ib* complex to be inaccessible from the southeastern corner of CEE. To represent the accessibility condition for the complex in the final phase of the cemetery dating class 11 was entered and all the intrusive shafts of the cemetery were used as barriers for the network analyst route solver. The result obtained assured that it was not possible to reach the complex from the south when the cemetery reached its current state. Theoretically there would have been an access to the complex by walking along the southern wall of CEE until its end, turning to the west around the Abu Bakr cemetery and then returning all the way down to the eastern edge of the western cemetery, where it would be possible to reach the complex from the north eastern corner. It is worthy of attention too that during the final phase of the cemetery, the mastaba of *fik-ti* became to be isolated from the *sndm-ib* complex, so that it was not possible any more to serve all the tombs of the family during one visit to the cemetery. The fact that several visits were now necessary to perform cult maintenance must have increased the effort required and consequently the expenses invested as well.

The complicated accessibility conditions were not limited to the *sndm-ib* complex but were common to the entire area of CEEN as another similar case demonstrates. *nfr-ḥtp* was responsible for bringing offerings to the tomb of *pn-mrw* (G 2197) from his *iti sšm-nr* III. The

⁴⁸ G 2381: the chapel is not fully detectable but the point was inserted on the northeastern corner of the mastaba following the proposal of Reisner for the reconstruction (*sndm-ib*, 150, 1). G 2381 A: the point was placed east of serdab of G 2381, where the entrance of G2381A was located according to Reisner (*sndm-ib*, 185).

exact origin of such offerings is not explicitly mentioned, but it had been suggested that it might be the tomb of *sšm-nfr* III⁴⁹ (G 5170). If so, *nfr-ḥtp* and his successors in the service of *pn-mrw* had to pass by the tomb of the later each time they headed to the tomb of their employer. Such a mission remained possible for a long period following the death of *pn-mrw* whose tomb belongs to dating class 5. Map 8 shows the itinerary of the proposed journey using dating classes ranging between 5 to 10. When the dating class 11, which represents the cemetery at its full growth, was however entered, both tombs became inaccessible.

⁴⁹ For discussion concerning this point see supra p. 157.

Appendix
ArcGis Tools used in the Study

In the following is an explanation for the ArcGis tools applied within the current study. Care was taken to list the tools in a practical manner as they are present in the version of ArcGis 9.3.

1-Spatial statistics

Spatial statistics measure and analyze the degree of dependency among observations in a geo-space. They require measuring a spatial weights matrix that reflects the intensity of the geo-spatial relationship between observations in a neighborhood, e.g., the distances between neighbors, the lengths of shared border, or whether they fall into a specified directional class such as “west.” Classic spatial autocorrelation statistics compare the spatial weights to the covariance relationship at pairs of locations¹. The null hypothesis for pattern analysis tools essentially states that there is no pattern; the expected pattern is one of hypothetical random chance². Spatial autocorrelation that is more positive than expected from random indicates the clustering of similar values across geo-space, while significant negative spatial autocorrelation indicates that neighboring values are more dissimilar than expected by chance, suggesting a spatial pattern similar to a chess board. ArcGis includes several statistical tools, from which the following was employed in the previous analysis:

1-A Analyzing patterns dataset

1-A-1 **Average nearest neighbor**

The nearest neighbor analysis is a classical technique used by archaeologists to analyze point distributions. Clark and Evans³ first explored the utility of nearest neighbor in ecology. The use of this tool in archaeological settlement pattern analysis was introduced by Hodder and Hassell⁴. That this method is popular is due to two factors: its straightforward calculation and its easy interpretation. Mathematically, the nearest neighbor index is expressed as the ratio of the observed distance divided by the expected distance (Observed Mean Distance / Expected Mean Distance⁵). The average nearest neighbor tool in ArcGis calculates a nearest neighbor

¹ ARLINGHAUS, *Spatial statistics*, 1- 3.

² HIETALA, *Intrasite spatial analysis in archaeology*, 47, 79.

³ CLARK and EVANS, "Nearest neighbor", 445-453.

⁴ HASSELL and HOODER, "Non-random spacing", 391-407.

⁵ The expected distance is the average distance between neighbors in a hypothetical random distribution.

index and demonstrates the results optionally as a graphic showing whether the features are clustering, random or dispersed.

How to interpret results

If the nearest neighbor index is less than 1, the pattern exhibits clustering; if the index is greater than 1, the trend is toward dispersion or competition.

1-A-2 Multi-distance spatial cluster analysis (Ripley's K-function)

To address some of the inherent problems of the nearest neighbor analysis, the Ripley's K-function⁶ was designed to identify the relative aggregation and segregation of point data at different spatial scales. The Multi-distance spatial cluster analysis tool in ArcGis determines whether a feature class is clustered at multiple different distances. It is designed mainly for point features but in case of line and polygon features, feature centroids are used in computations. The output is a table saved in a computer folder and a pop up graph which includes a diagram representing the values of the table. The output table has two fields named "ExpectedK" and "ObservedK". If a confidence envelope⁷ is specified two additional fields named "LowConfEnv" and "HiConfEnv" will be present with the confidence interval information for each iteration of the tool.

How to interpret results

The resulted graph would contain two lines: a blue line which represents the expected results and a red line which represents the observed results. Deviation of the observed line above the expected line indicates that the dataset is exhibiting clustering at that distance. Deviation of the observed line below the expected line indicates that the dataset is exhibiting dispersion at that distance.

1-A-3 Spatial autocorrelation (Moran's I)

Moran's I is a weighted correlation coefficient developed by Patrick A.P. Moran⁸. The statistic is used to detect departures from spatial randomness by determining whether neighboring areas are more similar than would be expected under the null hypothesis. The output of this tool in ArcGis is an index, a Z score and an optional graphic expressing the results.

How to interpret results

⁶ RIPLEY, "spatial point pattern analysis in ecology", 407-429

⁷ If points were randomly distributed (which is the Null hypothesis) than the observed K will fall in the range between values of the expected K. This range is called confidence envelope, because it is the reference to which we compare our results, if we want to prove or to reject the Null hypothesis.

⁸ MORAN, "Notes on Continuous Stochastic Phenomena" 17-33.

When the Z score is large (or small) enough that it falls outside of the desired significance, the null hypothesis can be rejected.

When the null hypothesis is rejected, the next step is to inspect the value of the Moran's I Index. If the value is greater than 0, the set of features exhibits a clustered pattern. If the value is less than 0, the set of features exhibits a dispersed pattern.

1-A-4 High low clustering Getis-Ord General-G

This tool calculates the clustering of the features based on the value of the input field. It divides the features to those with high values and those with low values. It then calculates the High/Low General G value (observed and expected) to see if the two groups cluster or not. The output is an a General G index⁹ and graphic showing whether the features are clustering, random or dispersed.

How to interpret results

A high general G index value indicates that high values are clustered within the study area. A low G index value indicates that low values tend to cluster.

1-B Mapping clusters dataset

The Mapping Clusters tools are used for cluster analysis to identify the locations of statistically significant hot spots or areas of significant diversity. Unlike the methods for identifying overall patterns (that is, tools in the Analyzing Patterns toolset) which produce a summary statistic, Mapping Clusters tools allow the viewer to actually see the location and extent of clusters of features or of features having similar values.

1-B-1 Cluster and outlier analysis (Anselin local Moran's)

Given a set of weighted data points, the cluster and outlier tool¹⁰ identifies those clusters of points with values similar in magnitude and those clusters of points with very heterogeneous values. It can be thus used to identify local clusters¹¹ or spatial outliers¹². The output is a layer with shafts where Local Moran's I value and associated Z are calculated for each shaft in two columns in the table of attributes.

⁹ For more reading about the Getis-Ord General G: GETIS and ORD, "The analysis of spatial association", 189-206.

¹⁰ For more reading about the Anselin Moran's local I: ANSELIN," Local Indicators of Spatial Association" , 93–115.

¹¹ Regions where adjacent areas have similar values.

¹² Areas distinct from their neighbors.

How to interpret results

Positive value for I indicates that the feature is surrounded by features with similar values. Such a feature is part of a cluster. A negative value for I indicates that the feature is surrounded by features with dissimilar values. Such a feature is an outlier.

A high positive Z score for a feature indicates that the surrounding features have similar values (either high or low). A group of adjacent features having high Z scores indicates a cluster of similarly high or low values.

A low negative Z score for a feature indicates the feature is surrounded by dissimilar values — that is, if a feature gets a negative Z score, it has a different value than its neighbors (a high value relative to a neighborhood that has low values or a low value relative to a neighborhood that has high values).

1-B-2 Cluster and outlier analysis with rendering

This tool performs the same operation as the last listed tool, then applies a cold-to-hot type of rendering for Z score¹³. The output is a layer with shafts where Anselin Local Moran's I value and the associated Z are calculated for each feature in two columns in the table of attributes.

1-B-3 Hot spot analysis (Getis-Ord Gi)

The Getis-Ord Gi statistic¹⁴ indicates whether features with high values or features with low values tend to cluster in a study area. The Hot Spot Analysis tool in ArcGis calculates the Getis–Ord Gi statistic for each feature in a weighted set of features and identifies thus spatial clusters of the statistically significant high or low attribute values. The Gi function creates a new feature class that duplicates the input feature class, then adds a new results column for the Gi z score.

How to interpret results?

A high z score for a feature indicates its neighbors have high attribute values, and vice versa. The higher (or lower) the z score, the stronger the association. A z score near zero indicates no apparent concentration (neighbors have a range of values).

To determine if the z score is statistically significant, you compare it to the range of values for a particular confidence level. For example, at a significance level of 0.05, a z score would have to be less than – 1.96 or greater than 1.96 to be statistically significant.

¹³ cold-to-hot graduated colour rendering to the field of z scores.

¹⁴ For more reading about the Getis-Ord Gi statistic: GETIS and ORD “Local Spatial Autocorrelation Statistics”, 286-306.

1-B-4 Hot spot analysis with rendering

This tool calculates the Getis-Ord G_i^* statistic and applies a cold-to-hot type of rendering to the output z scores. The G_i^* rendered model combines the functions Hot Spot Analysis and Z Score Rendering.

1-C Measuring geographic distributions dataset

1-C-1 Central feature

This tool defines the most centrally located feature in a point, line, or polygon feature class. Distances from each feature's centroid to every other feature centroid in the dataset are calculated and summed. Then the feature associated with the shortest accumulative distance to all other features (weighted if a weight is specified) is selected and copied to a newly created output feature class.

1-C-2 Directional distribution (standard deviational ellipse)

This tool measures whether a distribution of features exhibits a directional trend (whether features are farther from the mean center in one direction than in another direction). The tool functions by calculating the standard distance separately in the x and y directions. . These two measures define the axes of an ellipse encompassing the distribution of features.

The tool then creates a new feature class containing an elliptical polygon (the standard deviational ellipse). The attribute values for this ellipse polygon include two standard distances (long and short axes) and the orientation of the ellipse. If a case field is specified, the input features are grouped according to case field values, and a mean center is calculated from the average x and average y values for the centroids in each group.

2- Spatial analyst tools

2-A Point density

The analysis of point density is a commonly used technique in studying artifact distributions within archaeological sites¹⁵. The point density tool in ArcGis calculates the density of point features around each output raster cell. A neighborhood is defined around each raster cell center, and the number of points that fall within the neighborhood is totaled and divided by the area of the neighborhood. This method demonstrates the density of features in the given area for the visual examination.

¹⁵ RENFREW, *Approaches to social archaeology* , 170, 331.

3- Analysis tools

3-A Thiessen polygon

The Thiessen polygon tool converts input points to an output feature class of Thiessen proximal polygons. Thiessen polygons have the unique property that each of them contains only one input point, and any location within a polygon is closer to its associated point than to the point of any other polygon. This method attaches thus areas of space to the nearest center in its vicinity and is used often in social research to determine the center of a polity¹⁶.

4- Three dimensional analyst tools

4-A Viewshed analysis

A viewshed is an area that is visible from a specific location based on elevation values of a digital elevation model (DEM)¹⁷. A viewshed is created from a DEM by using an algorithm that estimates the difference of elevation from one cell (the viewpoint cell) to the next (the target cell). To determine the visibility of a target cell, each cell between the viewpoint cell and target cell is examined for line of sight. Where cells of higher value are between the viewpoint and target cells the line of sight is blocked. If the line of sight is blocked then the target cell is determined to not be part of the viewshed. If it is not blocked then it is included in the viewshed

4-B Line of sight

This tool determines the visibility, based on the elevation data, of all the points in a straight line on a surface between specified observer and target points and generates a line shapefile to display this information. The portions of the line that are hidden from the view of the observer are displayed in red, while the portions that are visible are displayed in green.

5- Network analyst

ArcGis provides a complete model for capturing, storing, and analyzing networks. Network Analyst extension¹⁸ provides also network-based spatial analysis including routing, travel directions, closest facility, and service area analysis. ArcGIS Network Analyst enables users

¹⁶ For more reading about thiessen polygon: RENFREW, *Approaches to social archaeology* , 65.

¹⁷ For more reading about the viewshed analysis: KIM, et al., "Exploring multiple viewshed analysis" , 1019–1032.

¹⁸ For more reading about the Network Analyst: DE SMITH et al., *Geospatial analysis*, 155 ff.

to dynamically model realistic network conditions, including turn restrictions, speed limits, height restrictions and traffic conditions at different times of a given period.

Conclusion

The study was concerned with the spatial analysis of the 2382 tombs of the entire Giza cemetery concentrating the socio-economic analysis on the 427 tombs which are located in CEE. Conclusions can be framed into several major points.

Since the beginning of planning of the WCE it was intended to lay the cores as close as possible to the pyramid. As soon as a piece of land had been cleared from the construction materials, it was used as a building ground for tombs. The same principle might have governed the direction of building in each stage. In the case of cemeteries G 1200 and G 2100 the direction was east to west, apparently because the bordering western lands were still occupied by building materials. The construction direction in G 4000 was from west to east, the first lines having been set initially in the middle of the cemetery to allow more lines of tombs to be constructed. In the ECE the building was initiated at a distance of about 200 meters to the east of the pyramid by G 7510 and G 7650.

The degree of visibility enjoyed by each tomb was a leading factor in setting the relative arrangement of tombs to each other. The original plan for the WCE was to arrange cores of equal sizes in regularly in parallel streets but at some point during the construction of that cemetery, maybe after the area to the west of the pyramid had been made accessible to more visitors, it was considered a privilege that passersby had a view of the tombs chapel. It was then that the En Echelon principle was introduced. Whether that innovation took place first in the western cores of G 2100 or in CEE, is hard to determine.

The royal complex influenced the planning of the cemetery by determining the initial positions of the nucleus cemeteries. The influence of the pyramid complex demonstrates itself in the general lines which constrain the early plans of the ECE and WCE as has been demonstrated in chapter one. The so called leading mastabas (G 1201, G 2100, G 4000) were not the first mastabas built in their nucleus cemeteries. On the contrary it seems that such large mastabas were built after the construction of their cemeteries had been well advanced. The owners of those mastabas might have wanted to stress their social privileges, or financial capacities more than the regular inhabitants of the cemetery, as already attested in G 1200.

Secondary cemeteries tended to have a higher density as they grow, but this factor alone cannot be used to determine the chronological development of the necropolis. Local factors such as

topographical features and the existence of larger earlier mastabas had also an influence on the final shape of the necropolis. Access to earlier structures was preserved as long as possible, and only blocked when building land in each cemetery became scarce. To answer the question whether the preservation of access was due to conventional morality or because of genealogical ties, more detailed research for each case would be required. Higher areas of density should in general be interpreted as later parts of the cemetery, and often as a meeting area between two simultaneously growing cemeteries.

Striving for the best visibility conditions influenced the expansion direction of secondary cemeteries and the competition to see and to be seen was no less fierce than the competition for a space of land.

Results from a seriation attempt confirmed the concepts of Reisner and Junker concerning the development and growth of CEE. The mastabas of the three En Echelon lines showed homogeneity in their features and distinction from the other mastabas in the cemetery to suggest that they formed the earliest construction phase of CEE. The spatial analysis of the seriation outcome suggested that the smaller tombs between the three En Echelon lines followed the large mastabas by a short interval of time. The CEES seems in general earlier than the CEEN so that the growth trend in CEE was from south to north. A number of tombs in the southeast corner of CEES seems however to be more or less contemporary with the *sndm-ib* complex. The tombs in CEEN showed little homogeneity in their features giving the impression that their building extended over a longer time.

Several statistical methods were performed to trace any recognisable trend concerning the spatial distribution of tombs classified according to several combinations of the titles of their owners. In all tested cases results obtained were however either dispersed or random. No clustering of tombs according to their owners' occupation could thus be traced neither in the nucleus cemeteries nor in CEE so that assumptions in this direction should remain speculative. It seems that the decision of tomb site selection was rather a matter of personal preference which was in turn influenced mainly by three factors: the chronology, the kinship ties and the service relationships between tomb owners. Chronology expressed itself in the simple fact that owners of later tombs had less freedom to choose their tomb locations because more and more of the ground of the cemetery was already occupied. The proximity to the pyramid of Khufu was not an attraction factor for the tomb site selection. On the contrary tombs extended in that direction only at the pressure of the decrease in the available space in the cemetery.

Kinship ties were perhaps the strongest factor which shaped the CEE as 45 pieces of evidence of kinship ties between tomb owners in this cemetery were collected. Even when a considerable

number of these indications could not be proved, three family lines could be traced demonstrating the tendency of members of the same family to be buried in the vicinity of each other in CEE. In two instances, this behavior led to the concentration of family tombs in one location so that a family complex was created in these two cases (*k3-n-nswt* and *sndm-ib* families). Tombs of the members of the *sšm-nfr* family showed less spatial concentration, but were still located at short distances from each other, the maximum distance recorded between two tombs (G 4940- G 4970) being no more than 70 m.

Service relationship played a considerable role in tomb site selection as well. It seems evident that the proximity to the served tombs was an important factor in determining the position of the tombs of their cult personnel. In the case of the *sndm-ib* family there is an evident concentration of cult personnel tombs around the complex of the family. For the cases of the *sšm-nfr* and *k3-n-nswt* families and the royal family of ECE, no such concentration can be traced since only one certain example of assured cult personnel exist for each. Yet the distance between the served tomb and the the tomb of the cult personnel is small in each case. For instance, G 5210 lies next to G 5110 and the distance between the G 2197 and G 5170 is no more than 60 m. The maximum recorded distance between served tombs and those of their cult personnel is between G 5210 and the tombs of the royal family in the ECE (ca. 500 m). This long distance can probably be justified by the wish of xm-nw to place his tomb near to the most recent member of the family which he served, who happened to be buried in CEE (G 5110).

The correlation between title and tomb wealth outlined in the current study agrees with Kanawati's and Roth's conclusions and supports their assumption that the land of tombs within OK cemeteries was allocated by the state. Finds concerning the mastaba area suggest a land rationing of some type which correlates with the rank of owners. However the 13 categories of a very fine classification of titles failed to fulfill this correlation. Combining several titles, based on a nearest neighbor analysis, produced more consistent results showing that tomb sizes of owners with similar groups of titles were more homogenous in comparison to those of diverse title groups. This outcome probably implies that the interference of the cemetery authority demonstrated itself better in determining the size of the tomb rather than its location.

An examination of the architectural elements of tombs revealed that the consideration of the availability of space affected the choice of their types. The use of certain chapel types became more limited as the cemetery grew because they required unoccupied land in front of the mastaba.

Calculations of effort expenditure and wealth estimations showed that the cemetery witnessed two phases in which the wealthiest tombs were constructed: the earliest phase of the cemetery including the three En Echelon lines and an advanced phase during which the *sndm-ib* complex was built.

During these two phases the cemetery was also occupied by bearers of the highest administrative title: the viziers. However, in both phases the viziers selected the sites of their tombs at different stages of their careers. During the earliest phase of the cemetery there are many indications that several viziers were promoted to the high office only while they were already building their tombs or nearly had completed them. The viziers of the last phase, on the other hand, seem to have rather chosen the location of their tombs while in office. This should lead to the conclusion that the last named phase marked a new era in CEE when those at the head of the administration of the country came to be buried there.

The relationship between the bearing of higher administrative titles and the wealth of the tomb is recognisable in CEE with some irregularities which must be an effect of chronology. Examination of family wealth proved the decline of the wealth of the three known families in CEE in different degrees, stressing again the effect of chronology upon the economic capacity of tomb owners. With more 50% of the examined cases of father-son relationships showing mutual titles in the same fields of administration, it can be tentatively concluded that the community buried in CEE presents evidence for the inheritance of titles during the OK.

The circumstances of the disturbed conditions of shafts upon their discovery could not support general conclusions about a pattern of artefact distribution but single cases show that the most costly materials and sophisticated objects were associated with tombs which show other indications of wealth concerning their superstructure and substructure volume.

Analysis of effort estimation for the transportation of stones showed that quarry number 8 was the optimal stone source for the three En Echolon lines and that quarry number 1 must have been used as well during the later stages of the cemetery. The examination of a transportation model in CEE indicated that mastabas of the three En Echolon lines enjoyed the best accessibility conditions since most of their east faces preserved good access till the last phase of the cemetery. Access to the *sndm-ib* complex and the surrounding tombs in CEEN on the other hand was gradually blocked from the CEES. The several discussed examples of inaccessible tombs at the later stage of CEE demonstrate clearly that bad accessibility conditions must have contributed to the gradual decay of the cemetery and to its eventual disuse.

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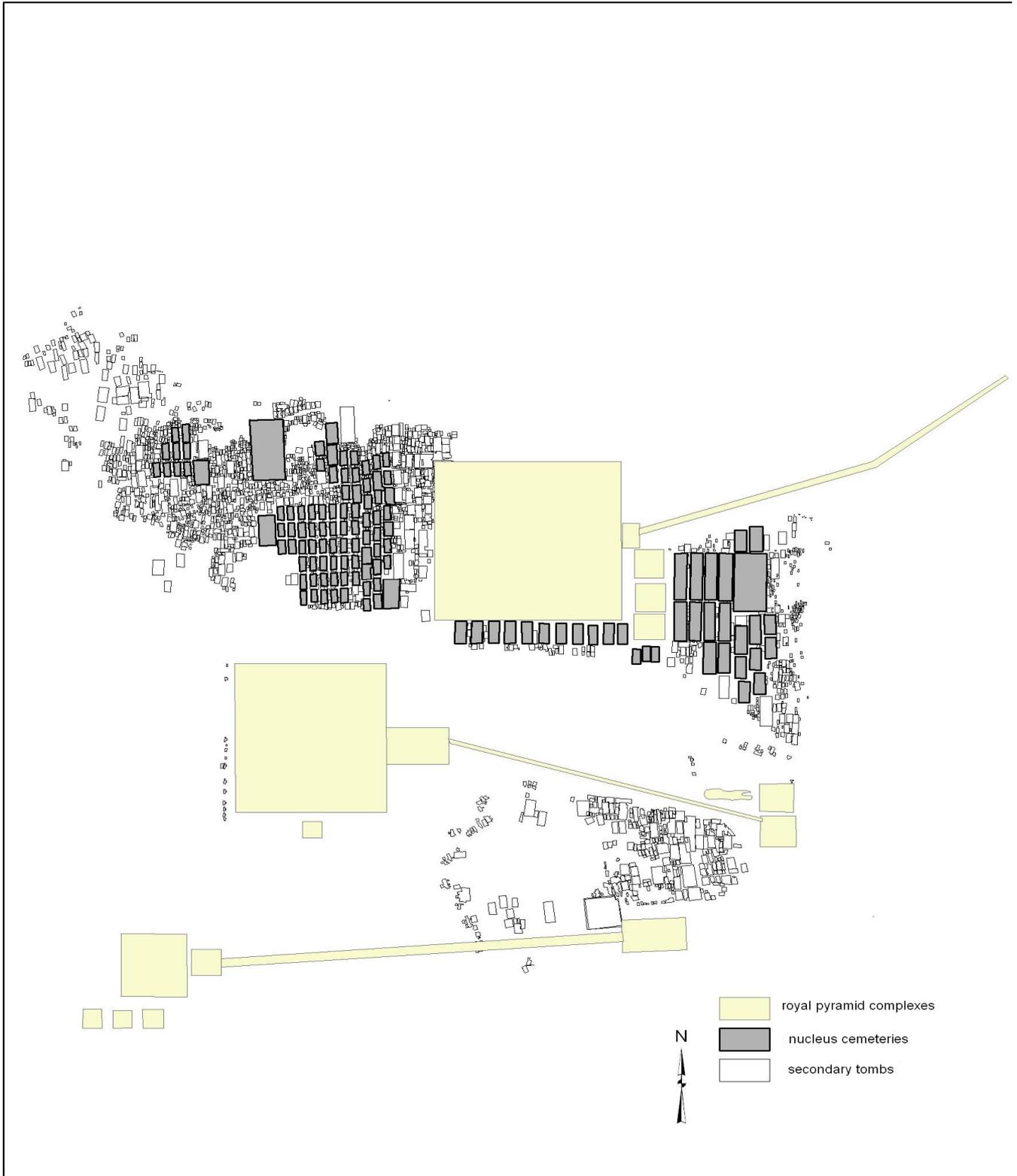
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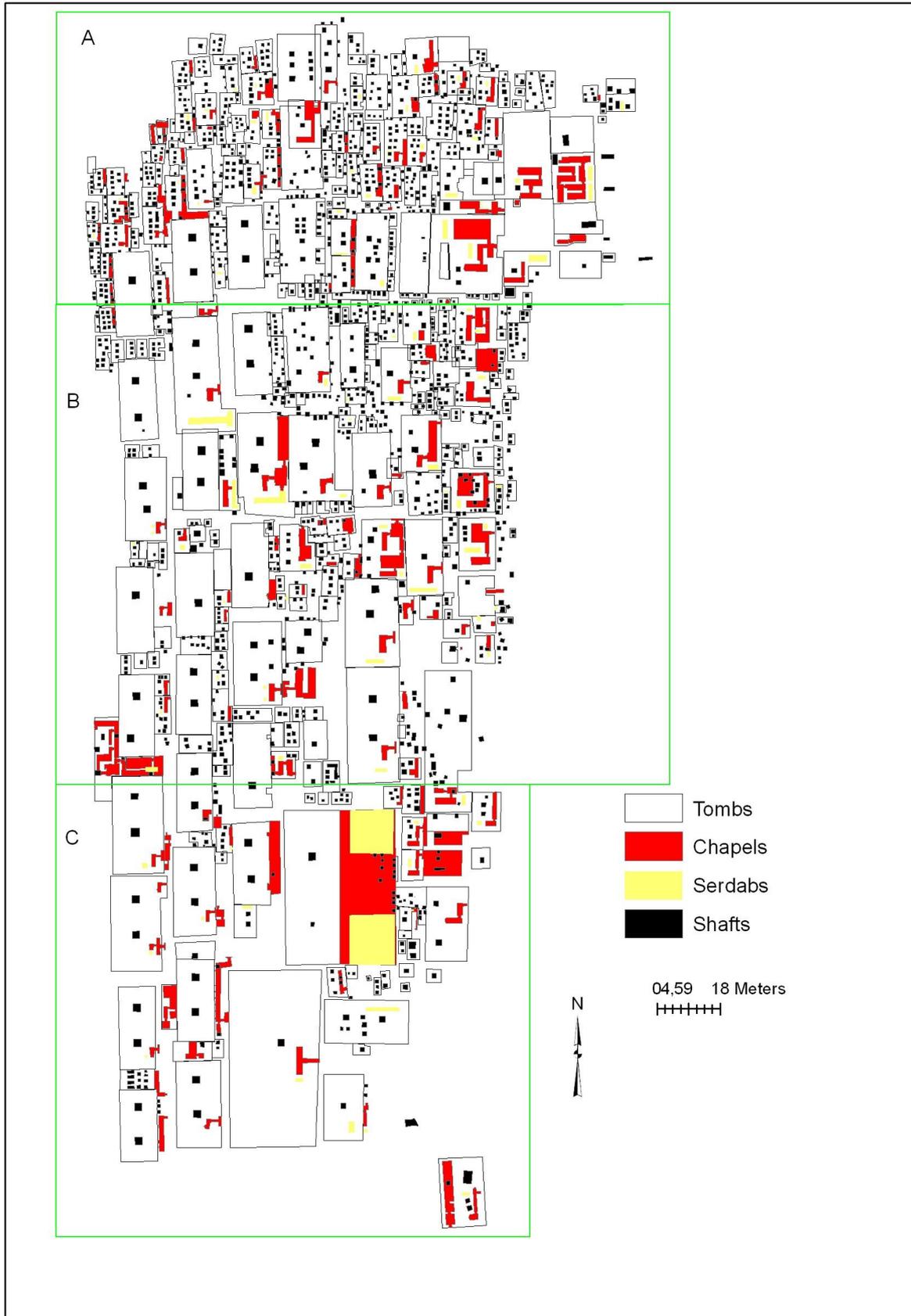
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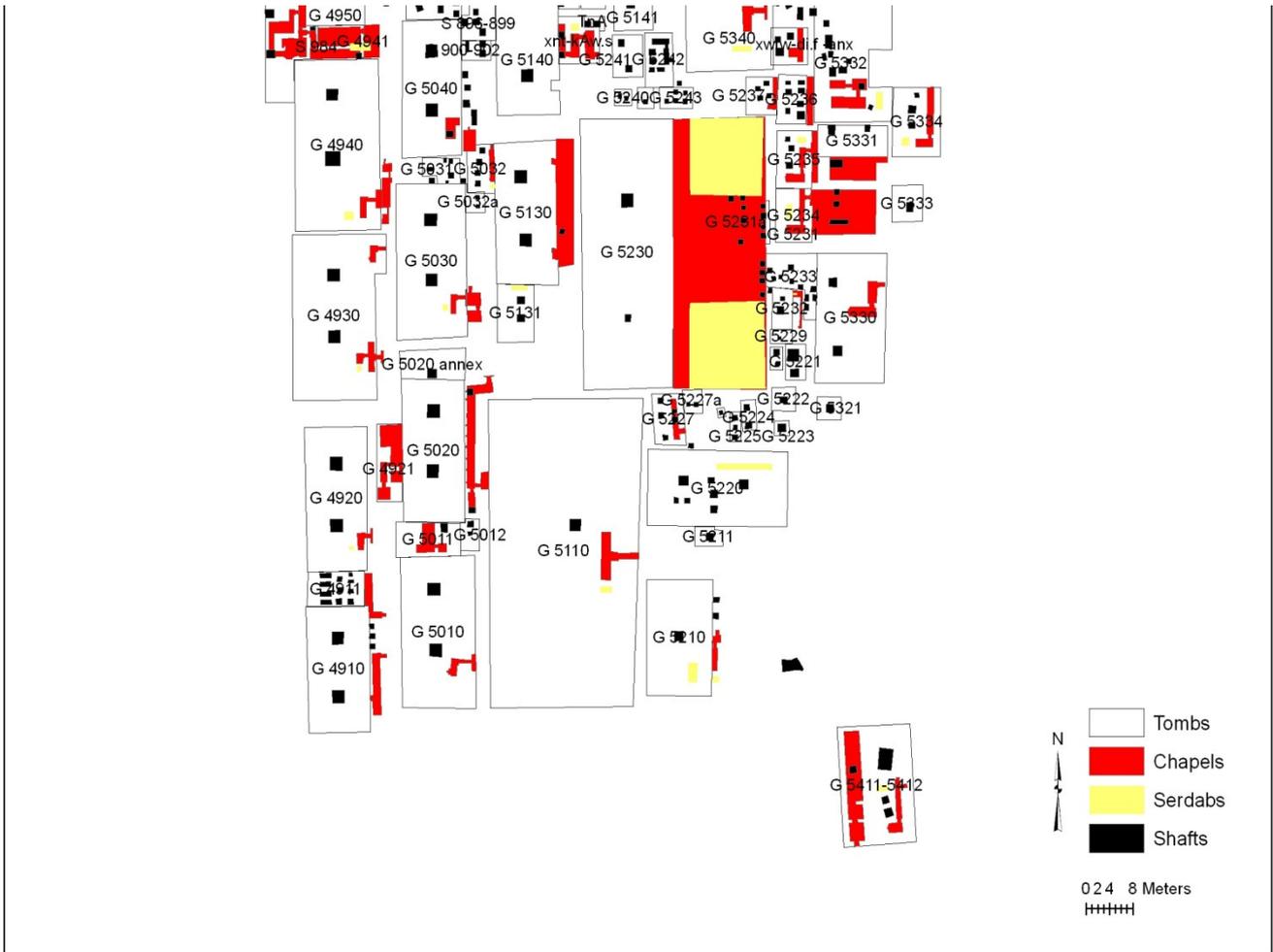
Maps



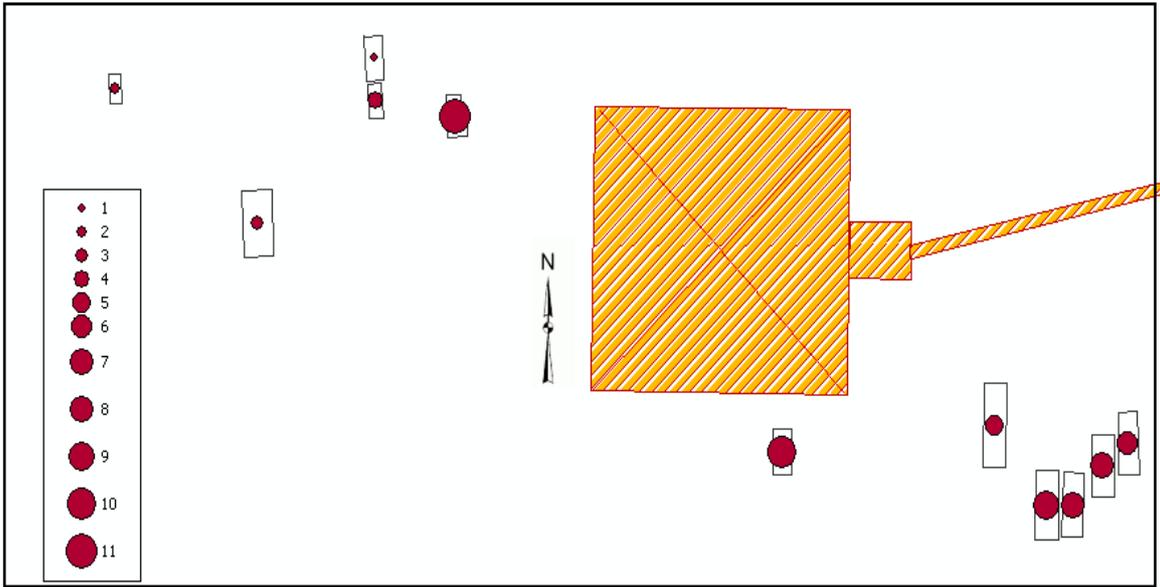
Map 0.1: complete Giza necropolis



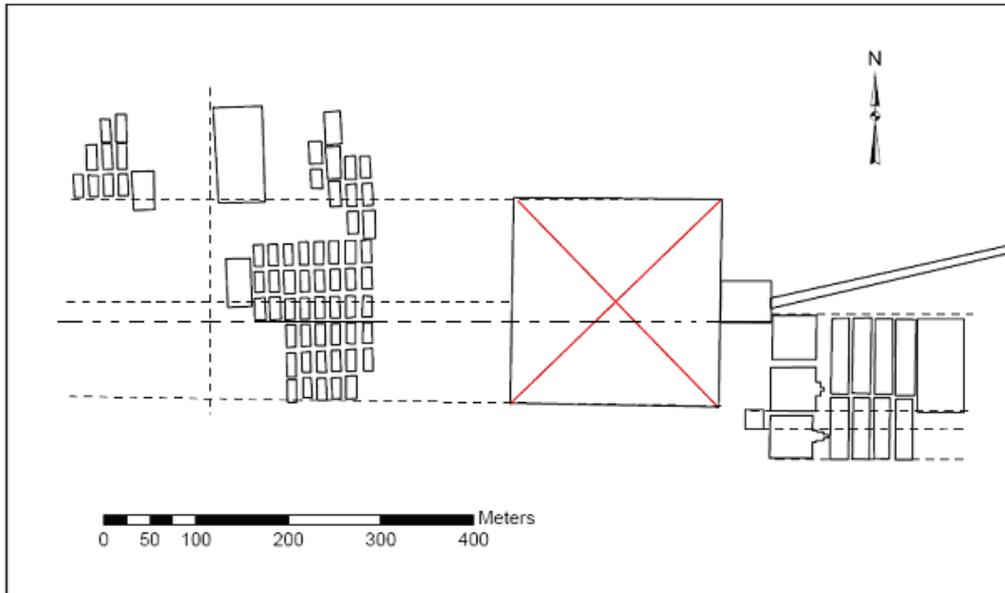
Map 0.2: complete CEE



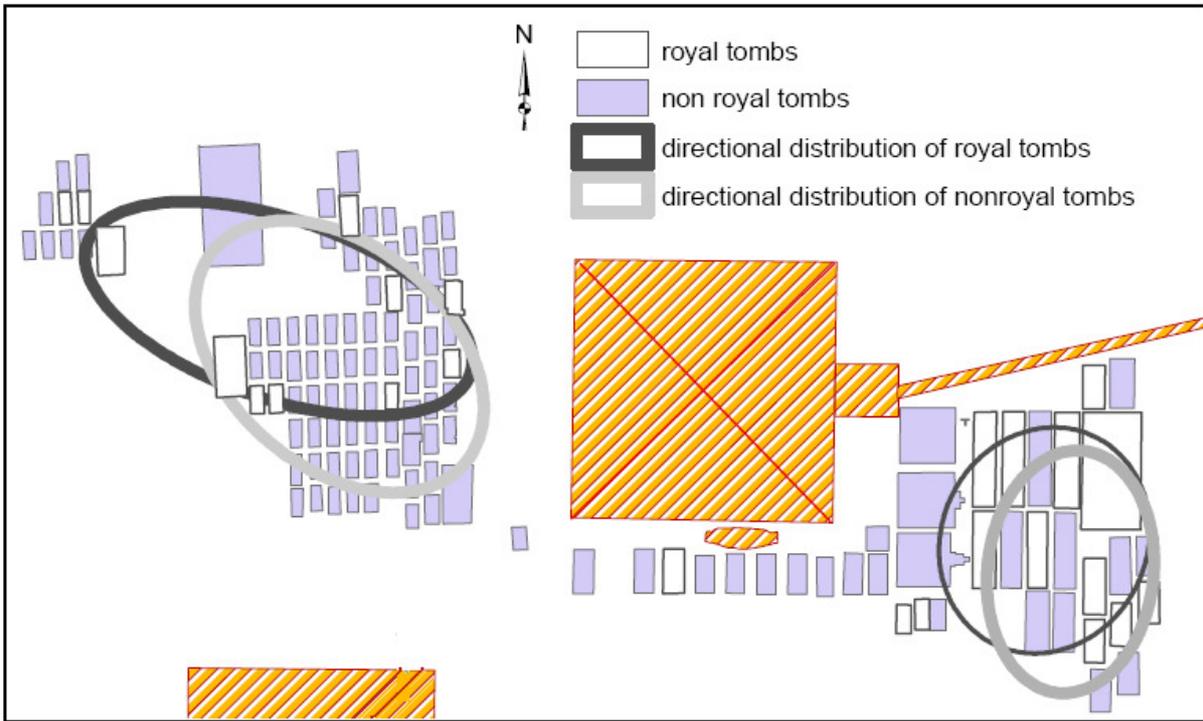
Map 0.2 detail C



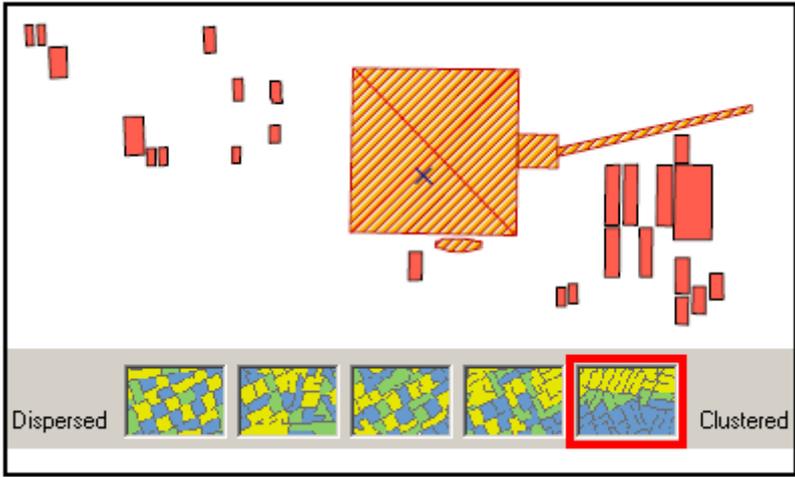
Map 1.1: building graffiti dates in ECE and WCE



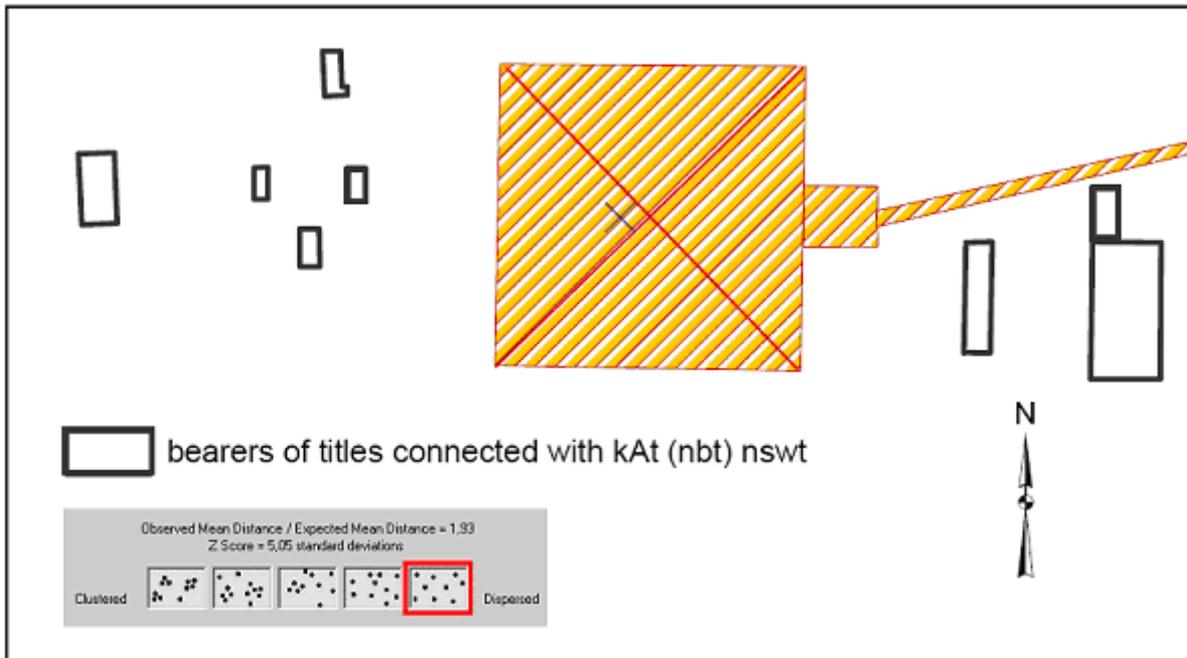
Map 1.2: Lines of the early Giza necropolis



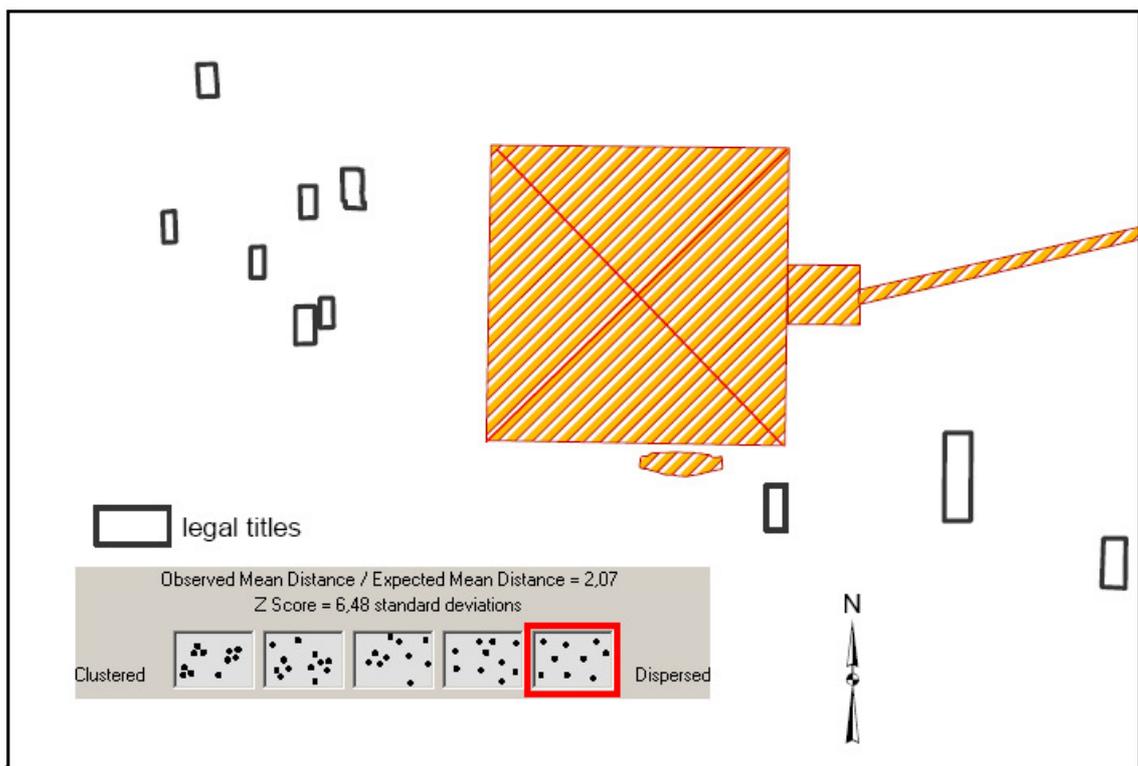
Map 1.3: Distribution of royal tombs versus non royal tombs



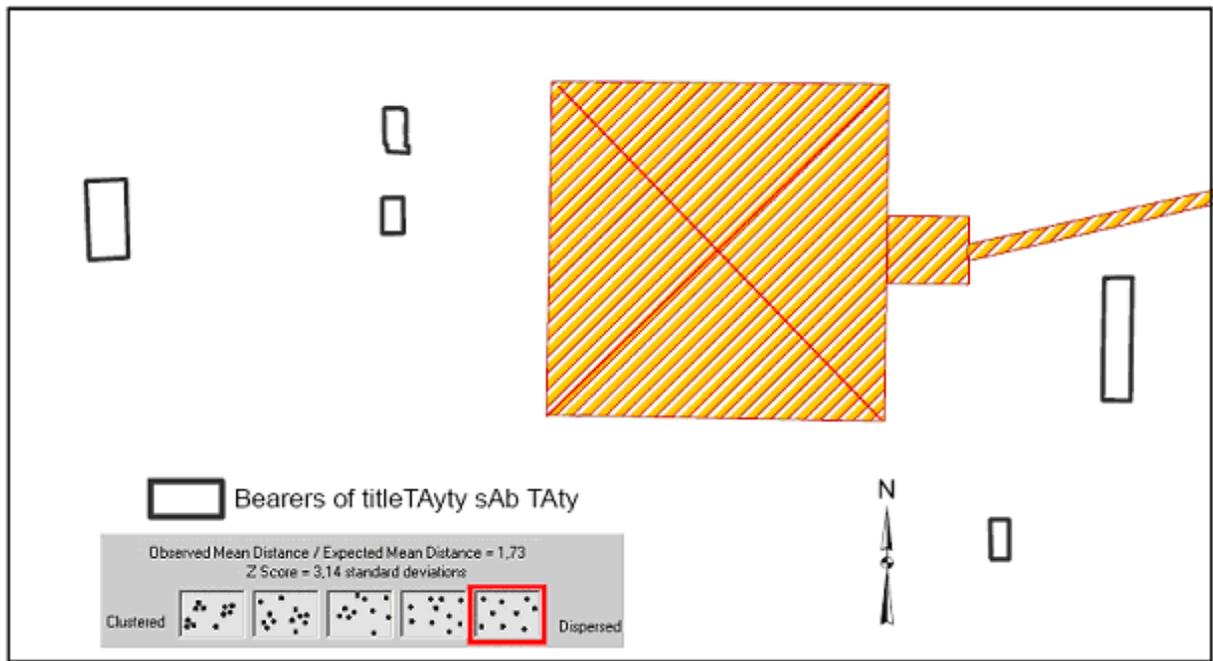
Map 1.4: Tombs of holders of royal titles with Moran's I index outcome



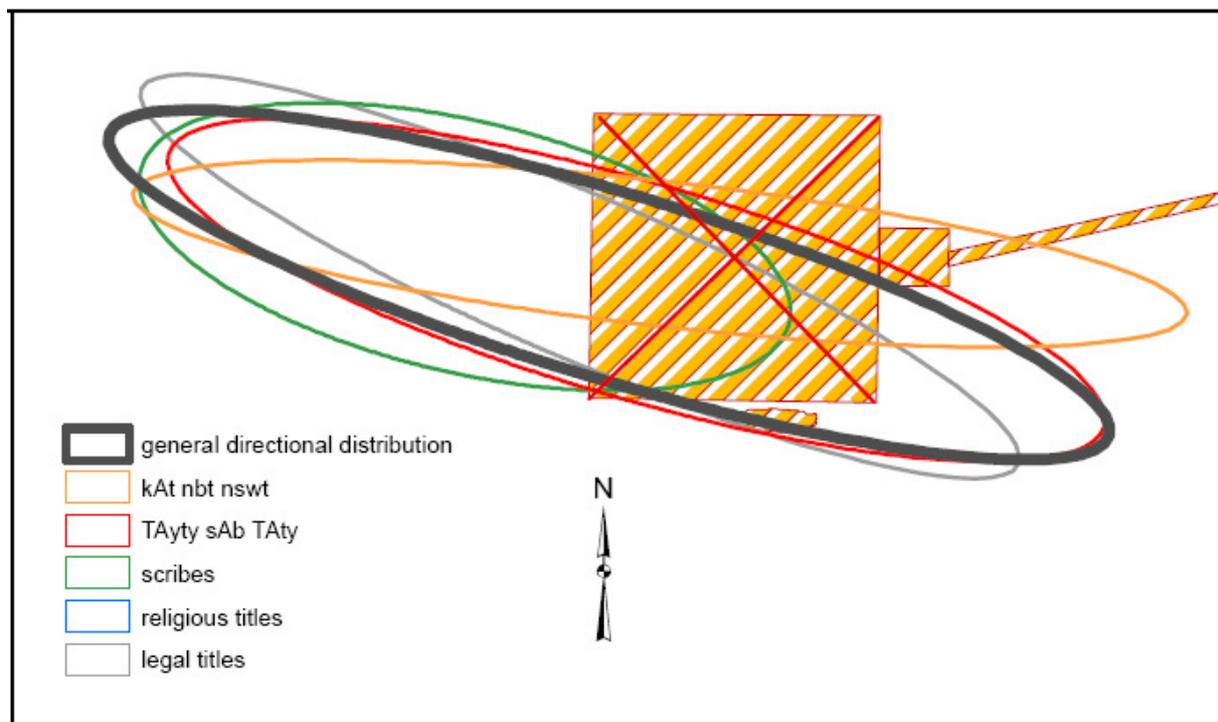
Map 1.7: holders of title *imy r3 k3t (nbt) nswt* with nearest neighbour analysis outcome



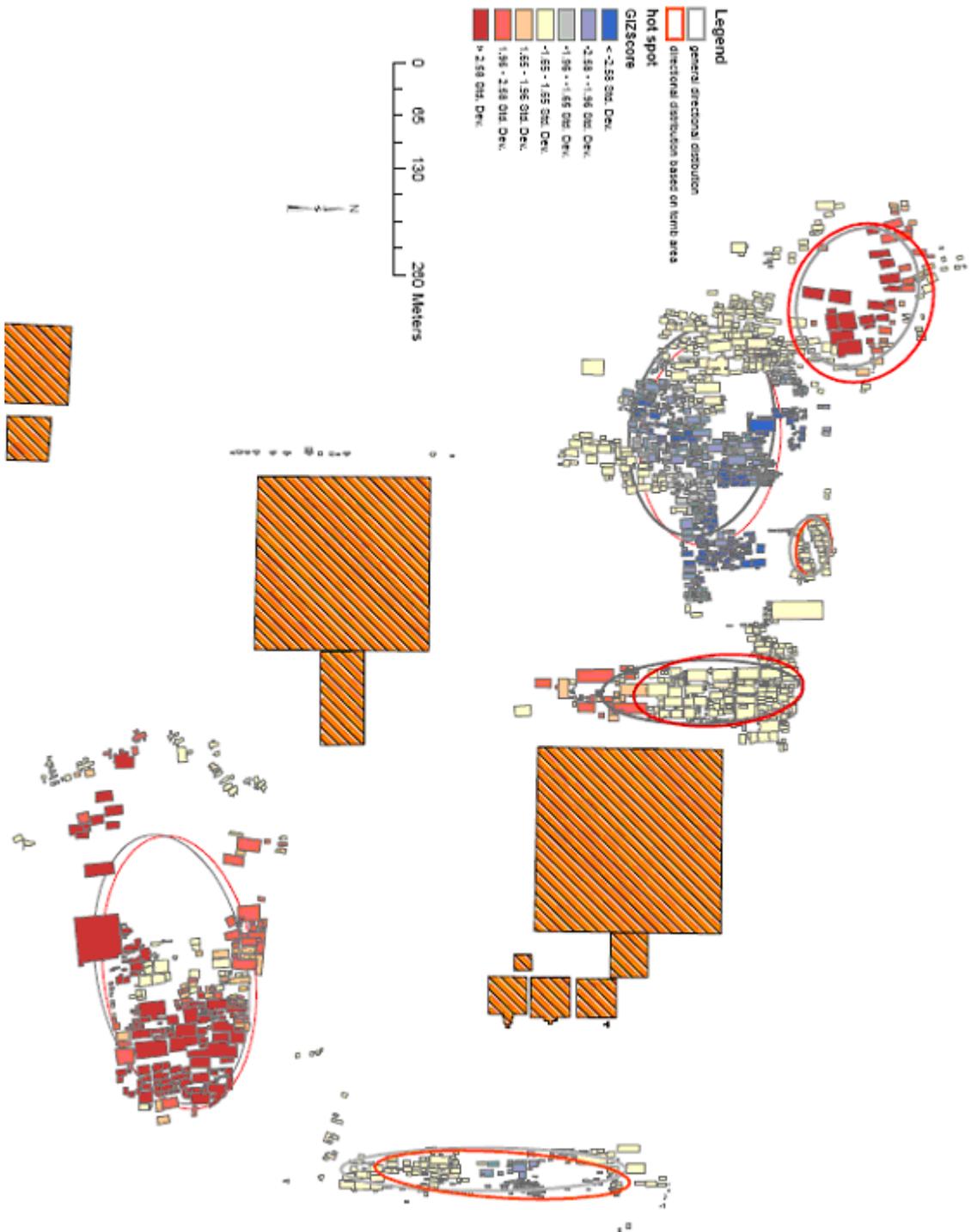
Map 1.8: holders of legal titles with nearest neighbour analysis outcome



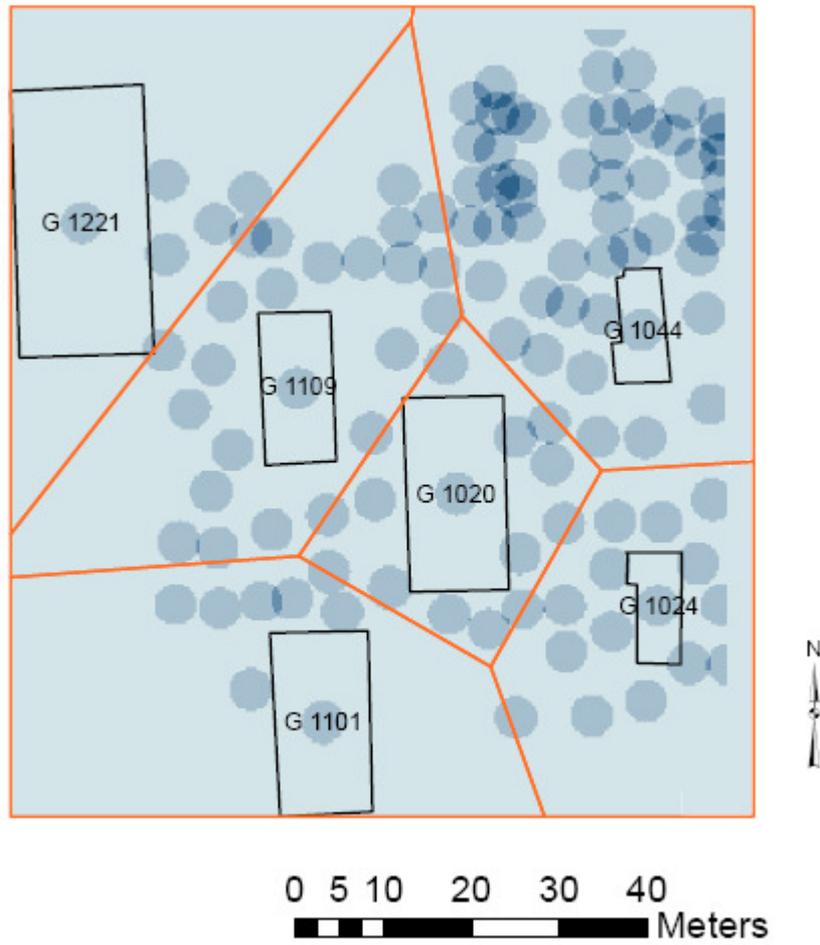
map 1.9: holders of title $\bar{t}y\bar{t}y \bar{s}sb \bar{t}t\bar{y}$ with nearest neighbour analysis outcome



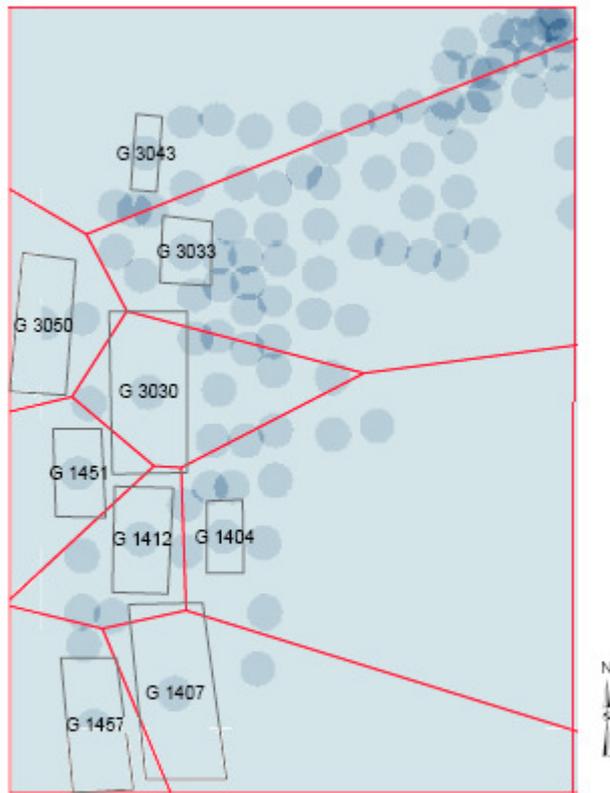
Map 1.10: standard deviational ellipses of 5 title categories



Map 1.11: Directional distributional ellipses and hot spot analysis of independent secondary tombs

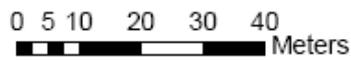


Map 1.12 : point density and Thiessen polygons of cemeteries G 1000 and G 1100

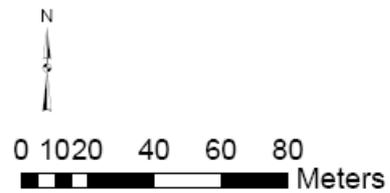
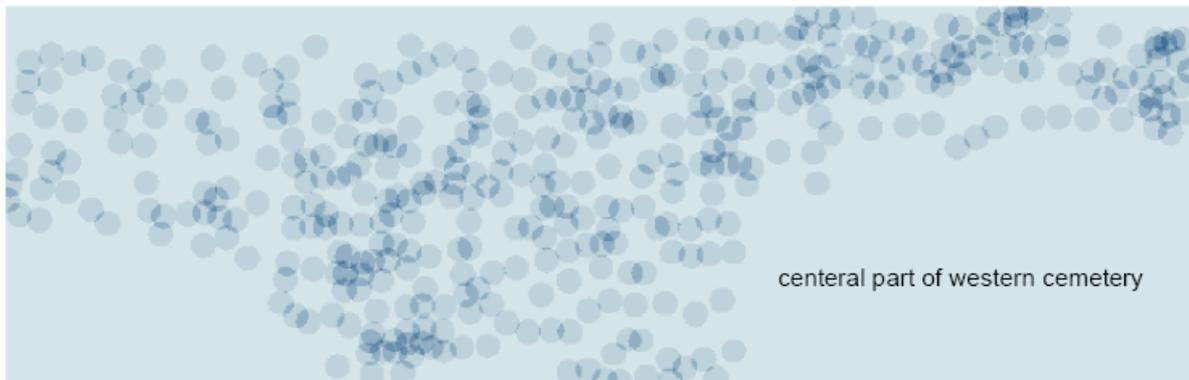


0 3 6 12 18 24
Meters

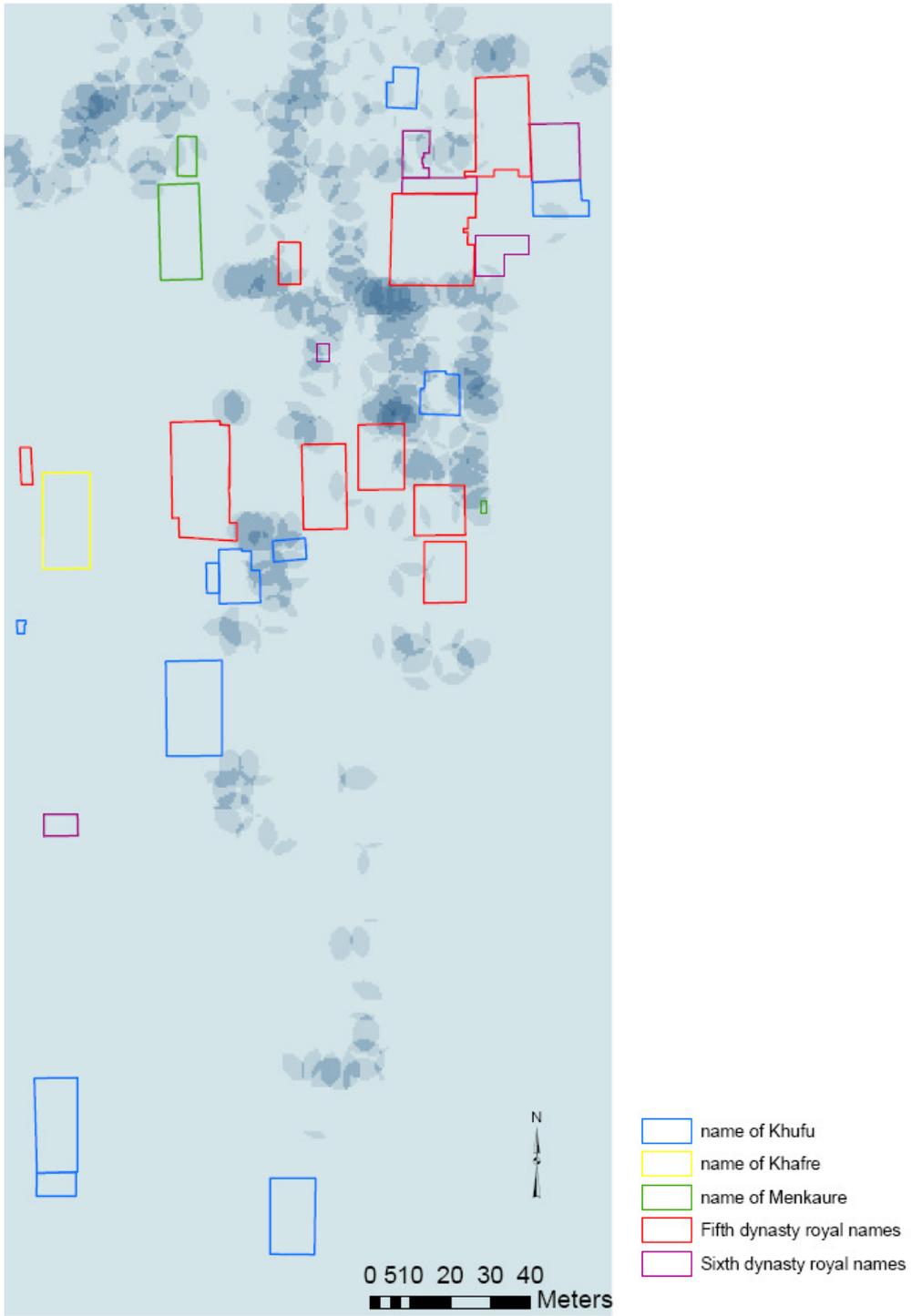
Map 1.13: point density and Thiessen polygons of cemeteries G 1600, G 1400 and G 3000



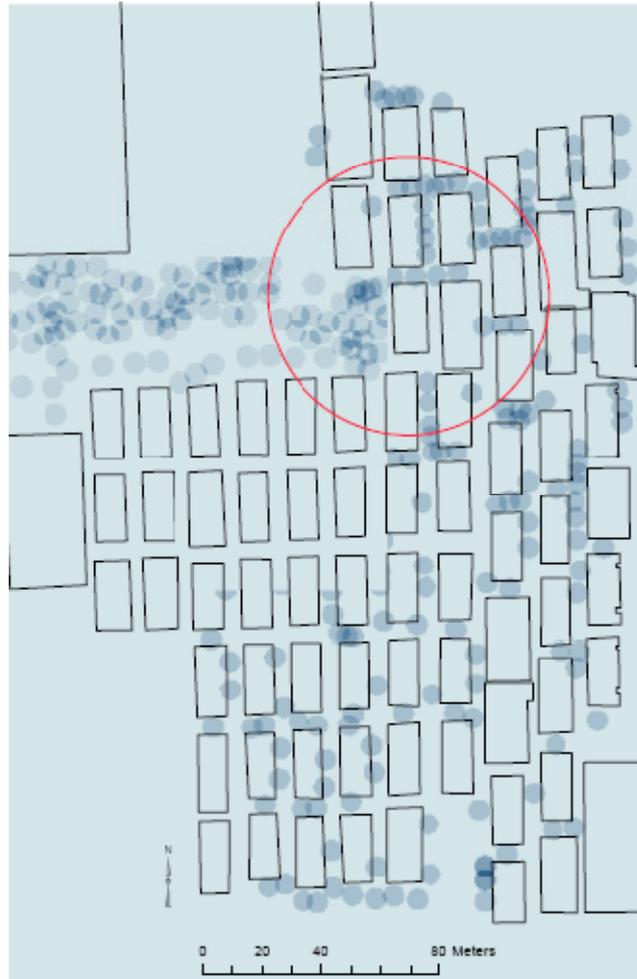
Map 1.14: point density of cemeteries G 2000 and G 2100



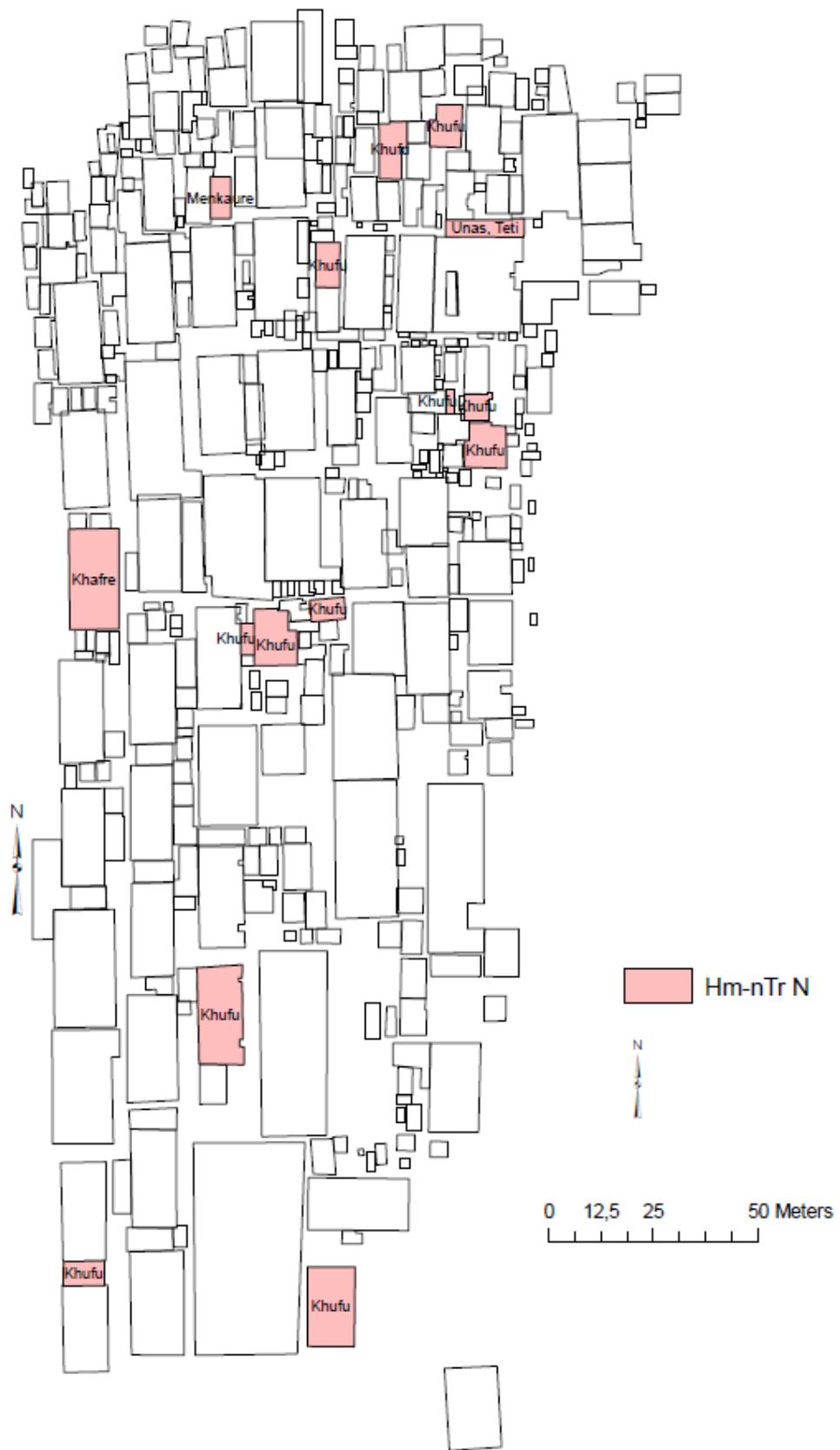
Map 1.15: point density of cemetery G 6000 and the central part of WCE



Map 1.16: point density of CEE with occurrence of names of kings

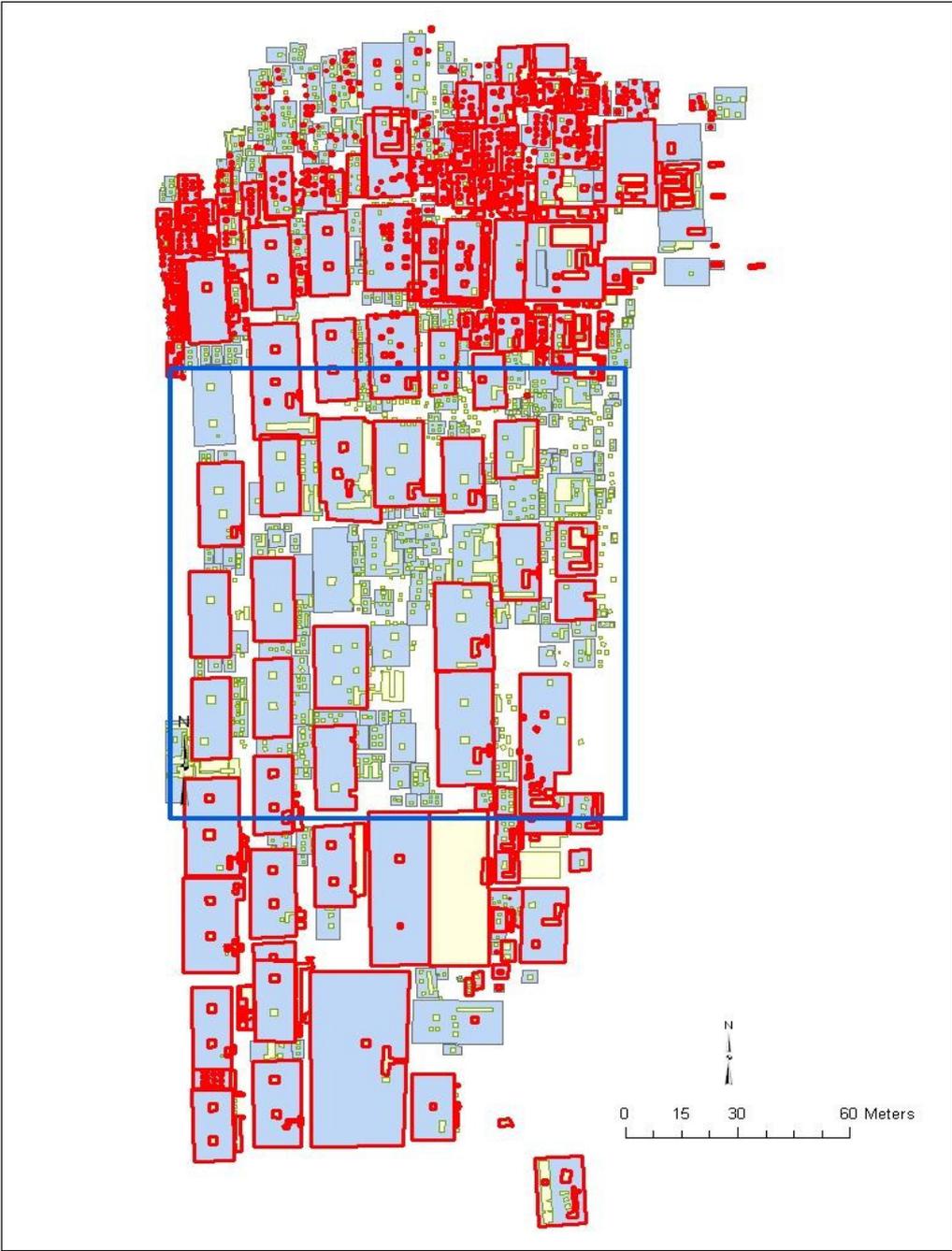


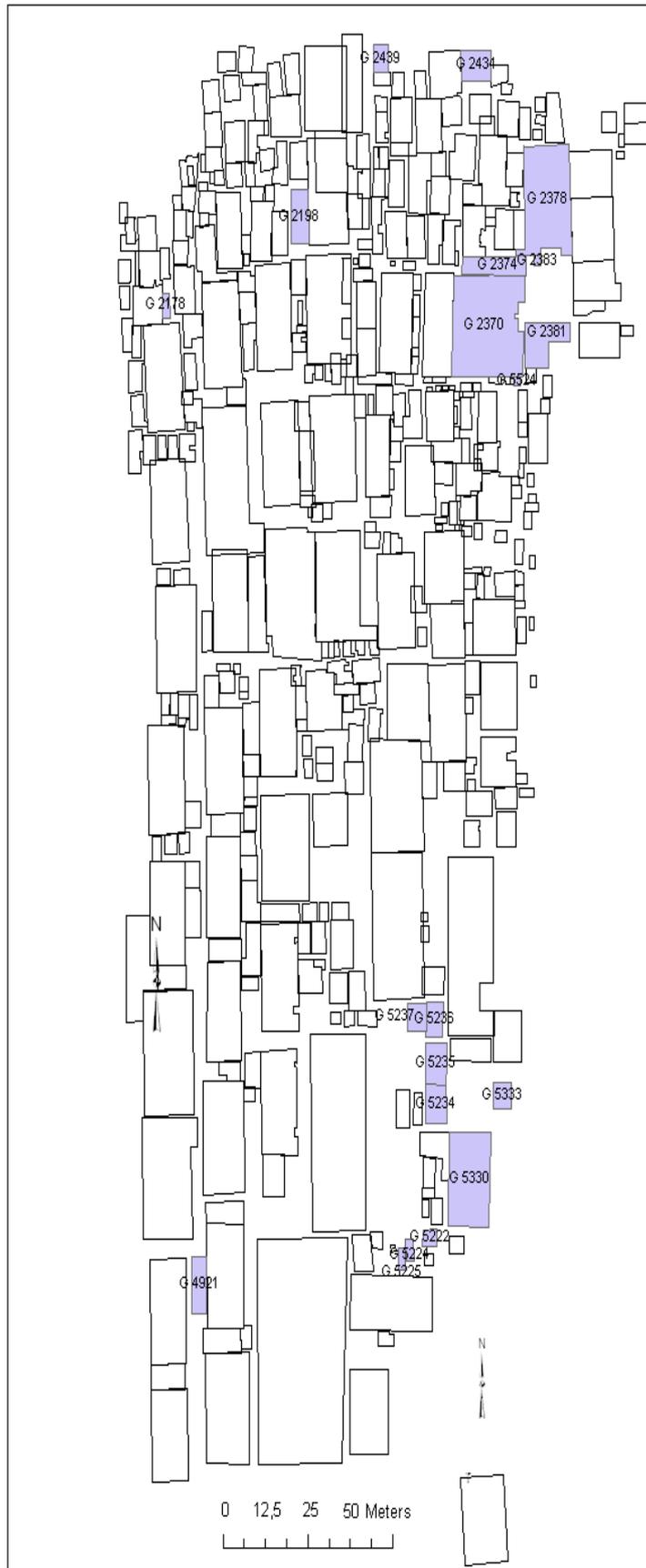
Map 1.17: point density of secondary intrusive tombs in WCE



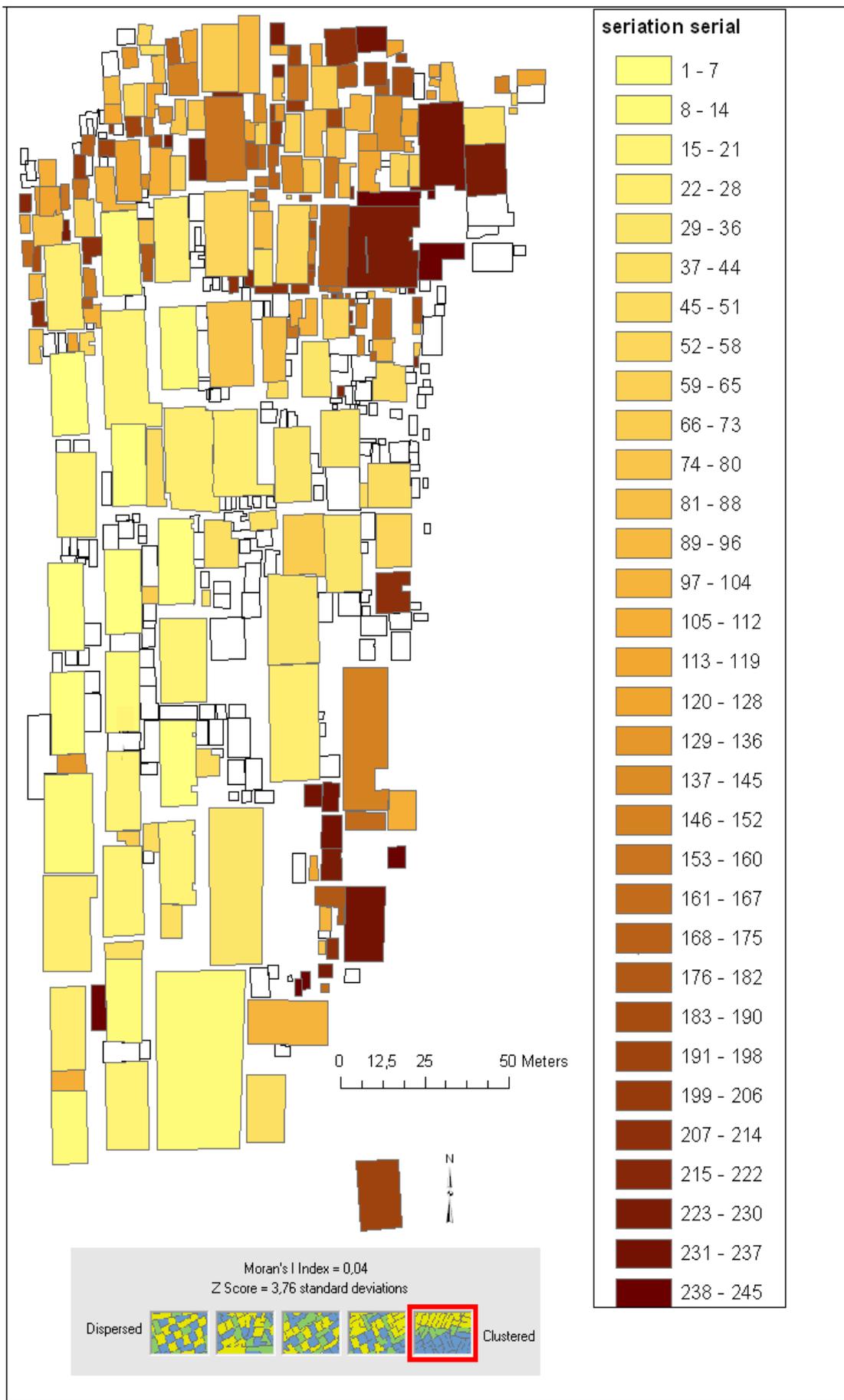
Map 3.1: bearers of *ḥm-nṯr* of kings

Map 3.3: features outlined with red were classified by Reisner , area within blue rectangular was excavated by Junker

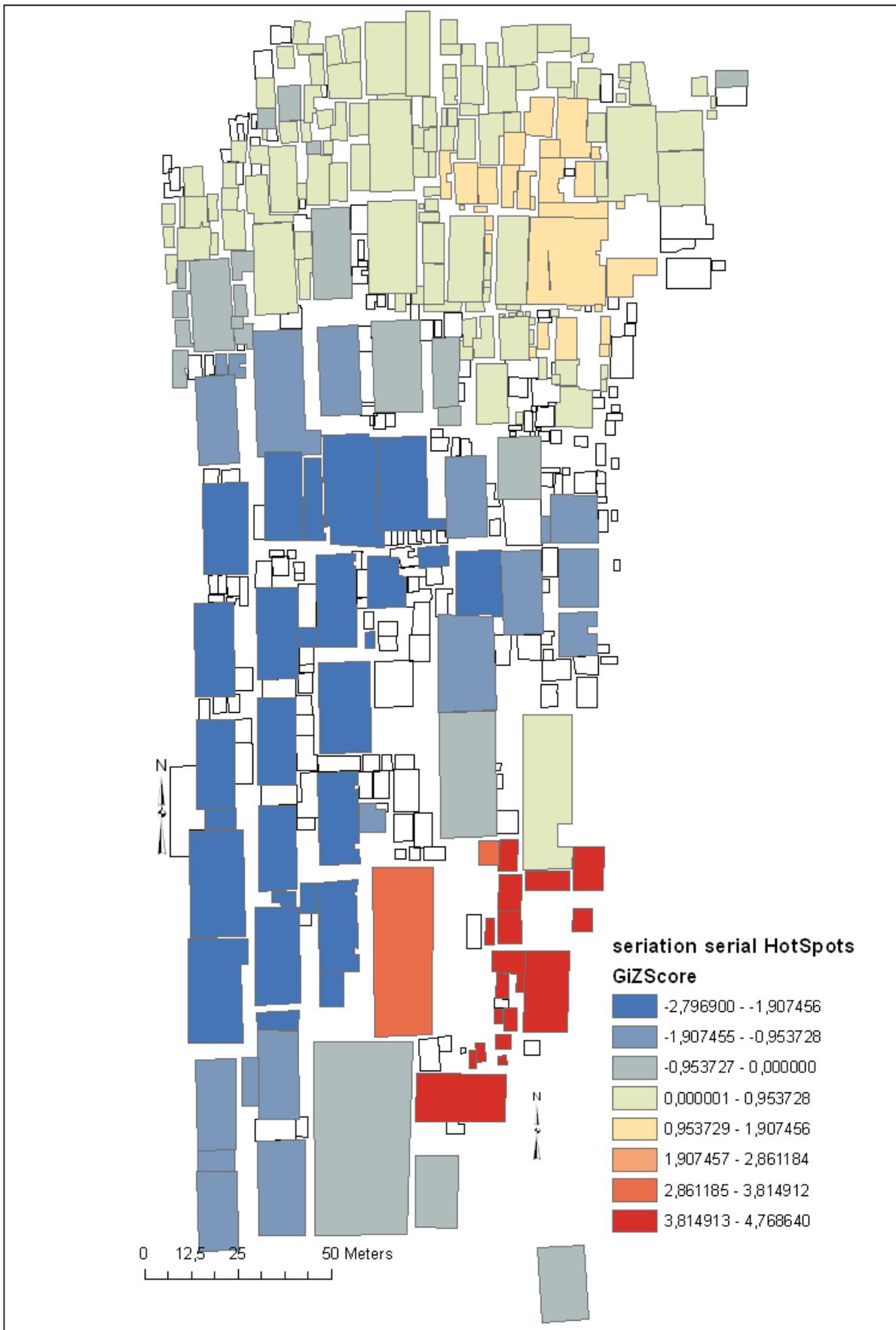




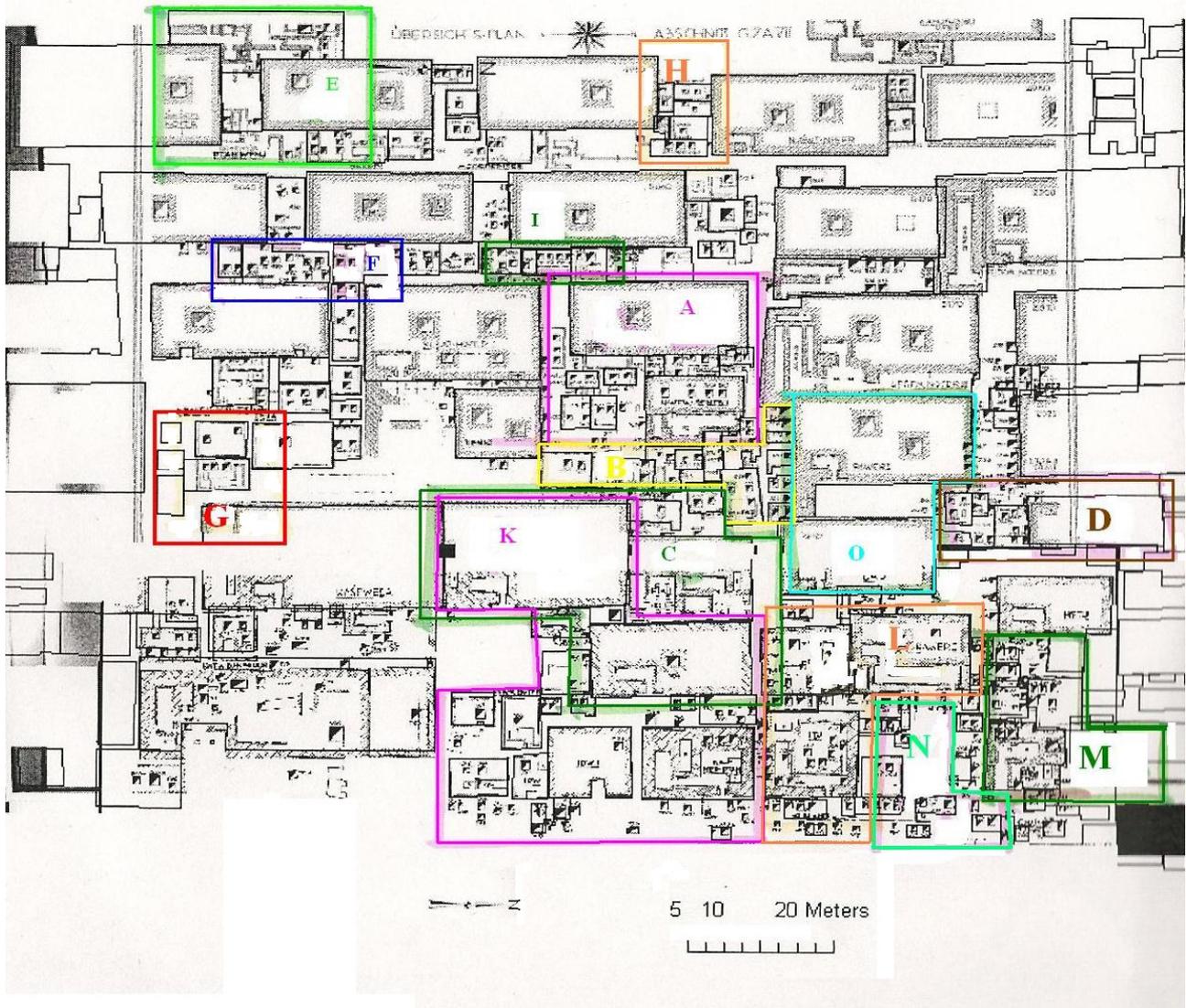
Map 3.4: tombs at the left edge of the seriation graph 2



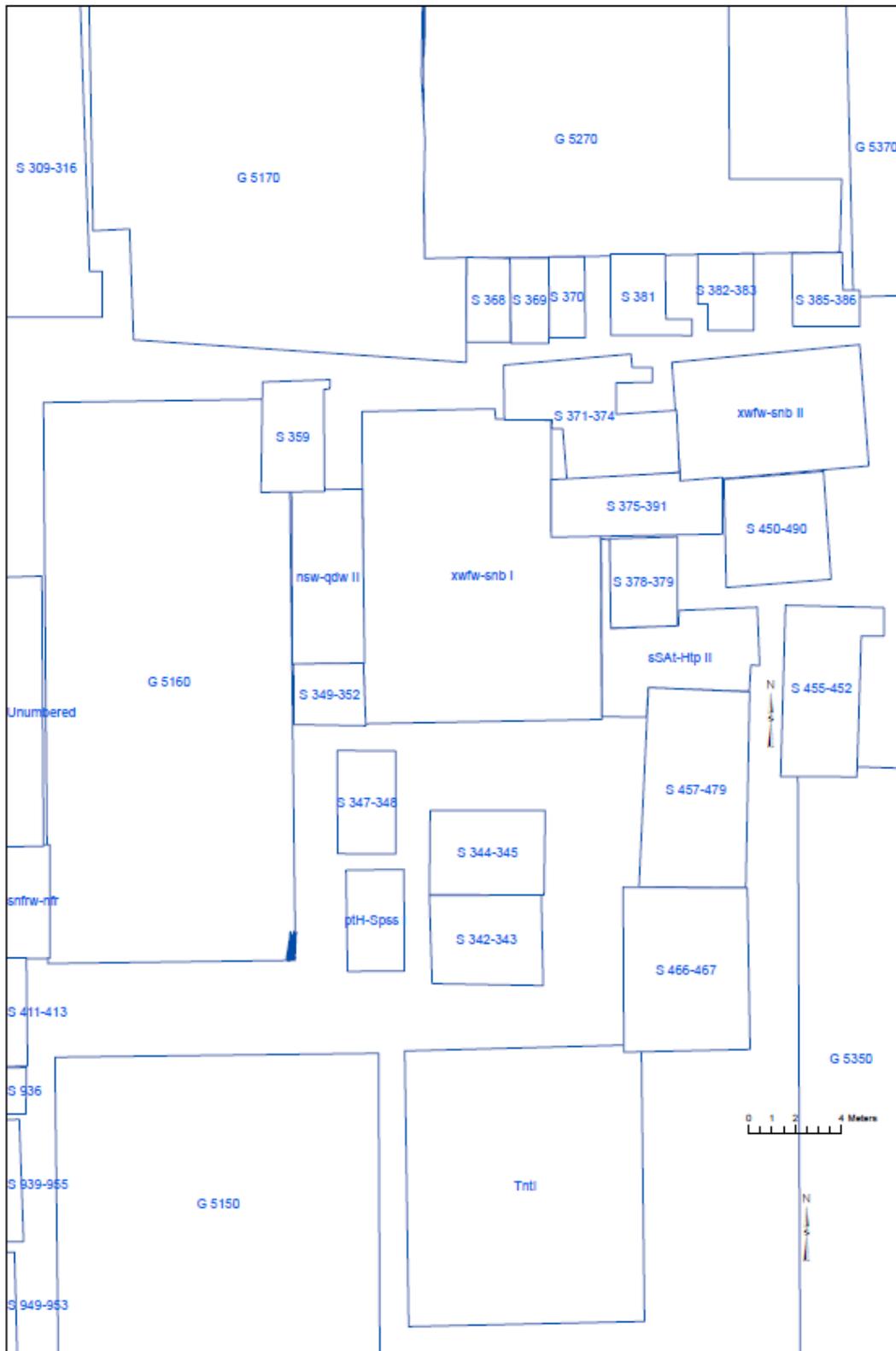
Map 3.5: Seriation serial numbers and Morans I index



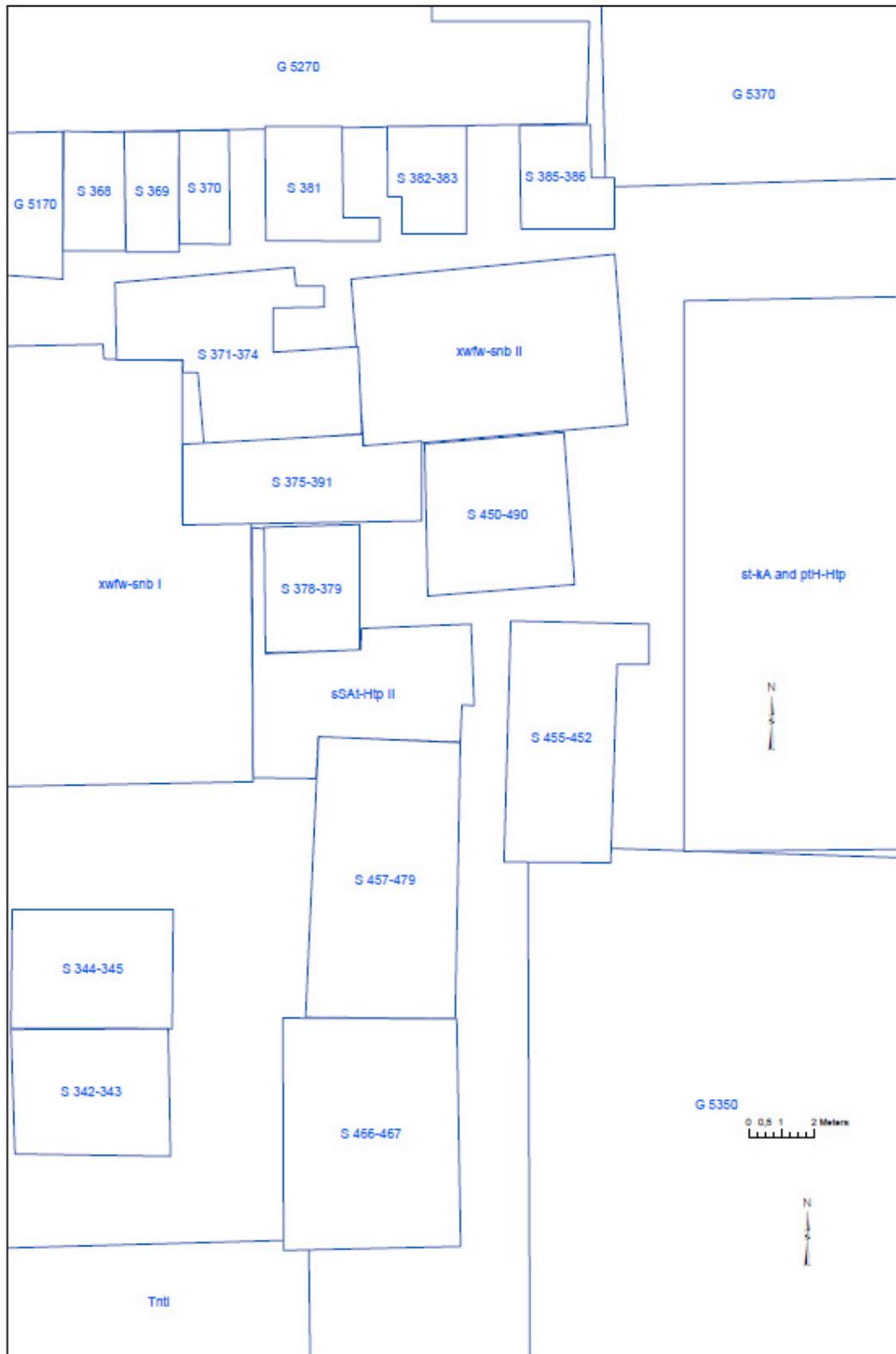
Map 3.6: hot spot analysis for CEE according to seriation serial number



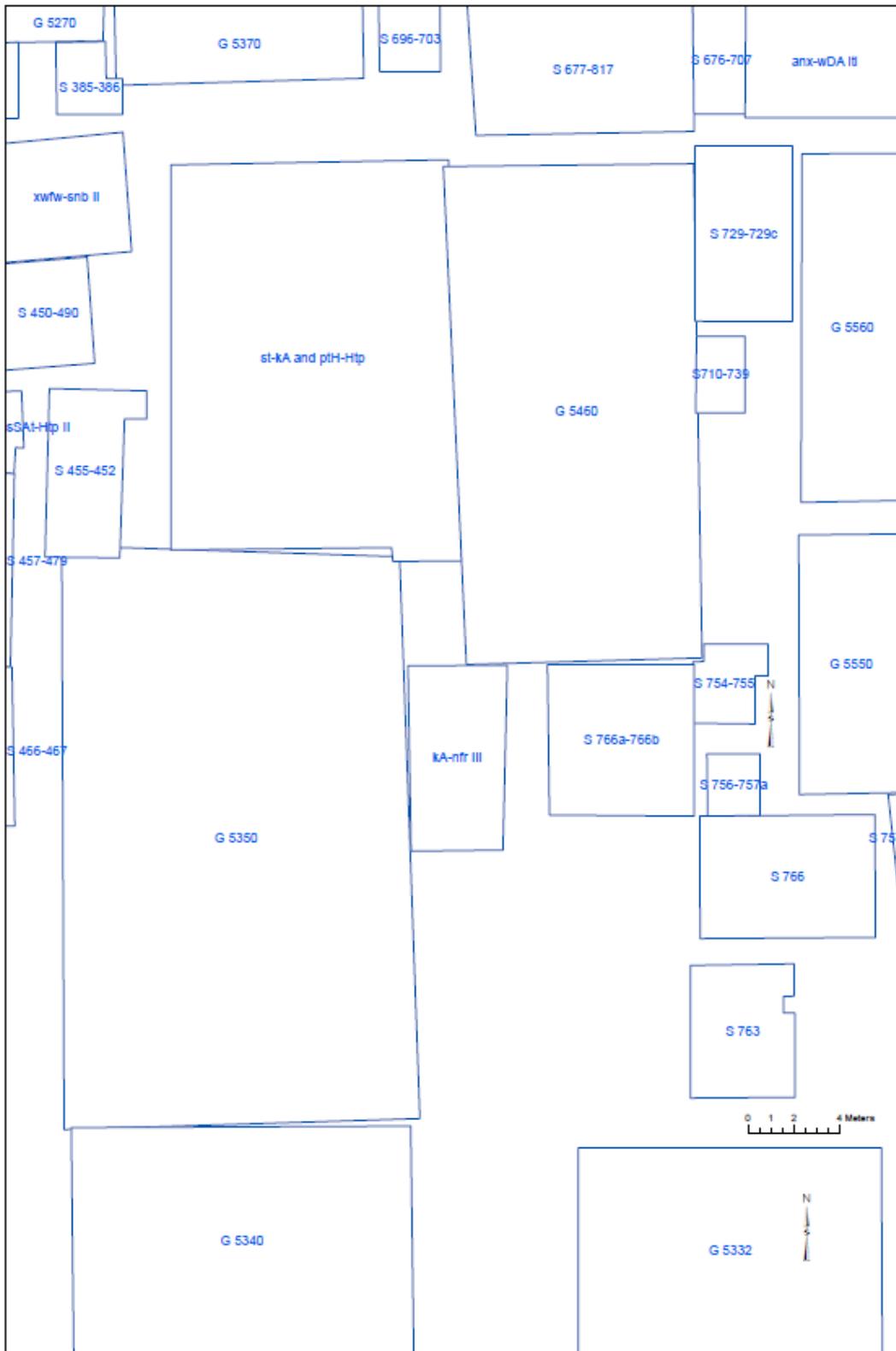
Map 3.7: Key map for sequence of dating according to Junker



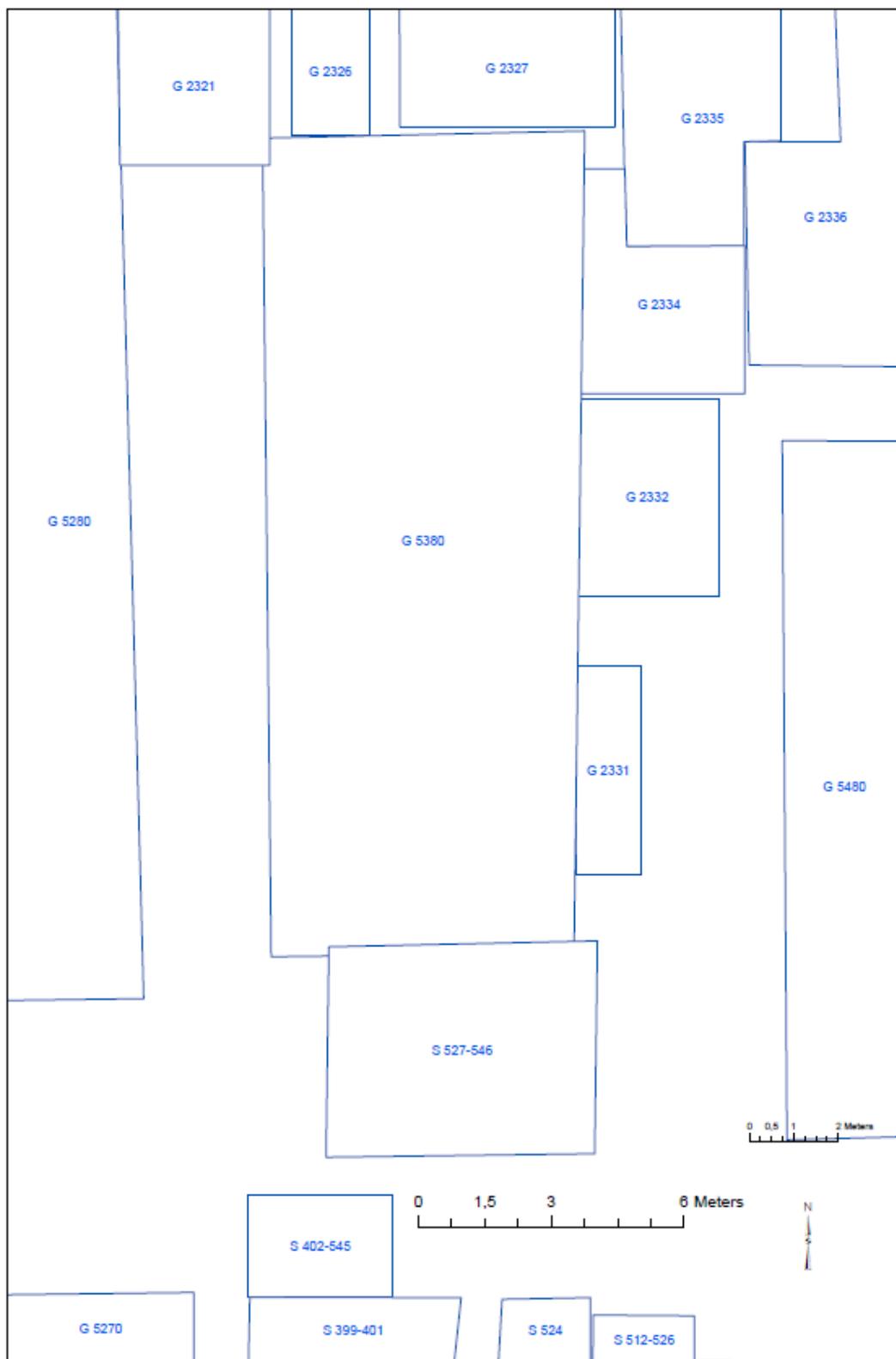
detail of map 3.7: group A of Junker



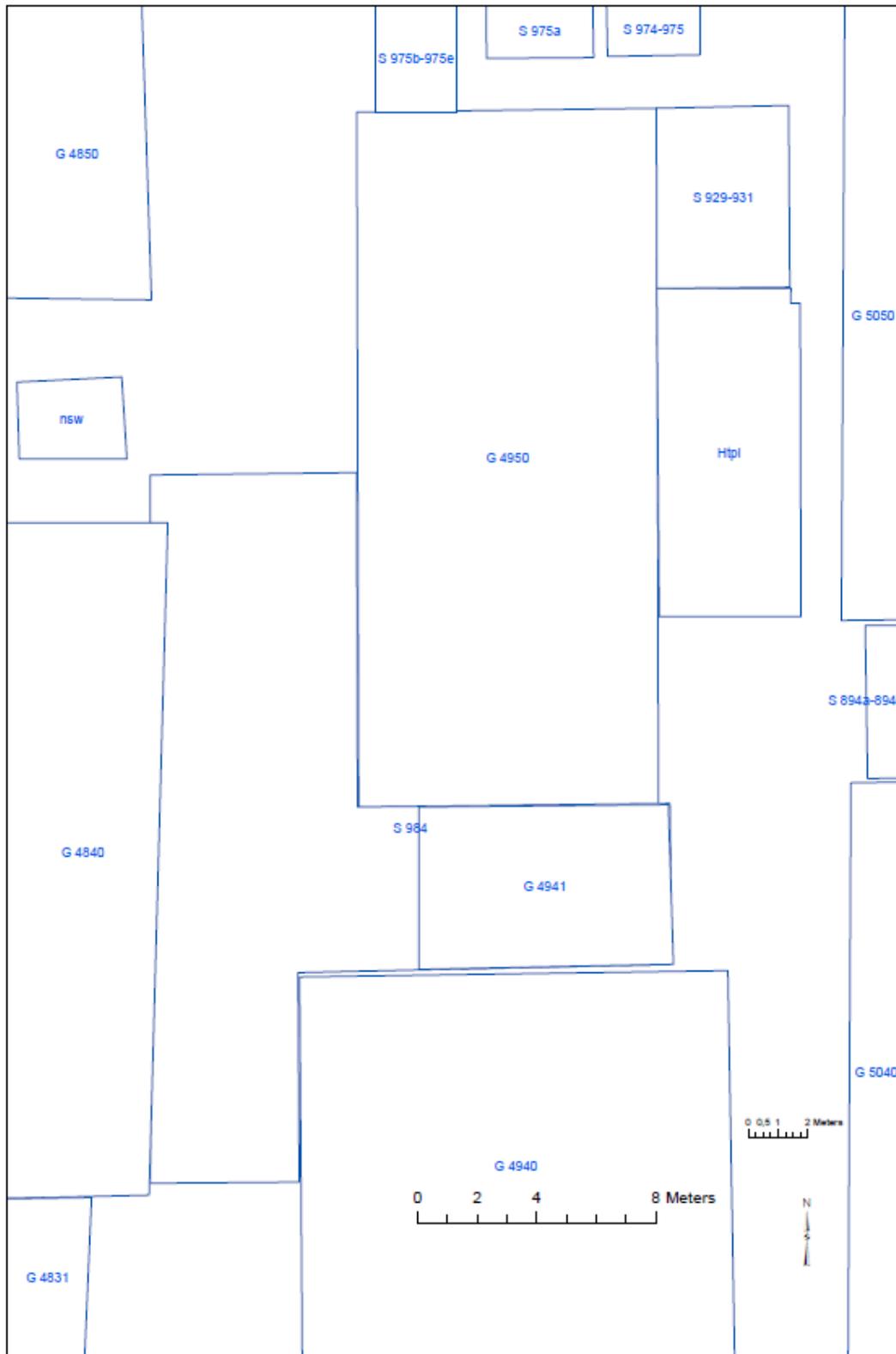
detail of map 3.7: group B of Junker



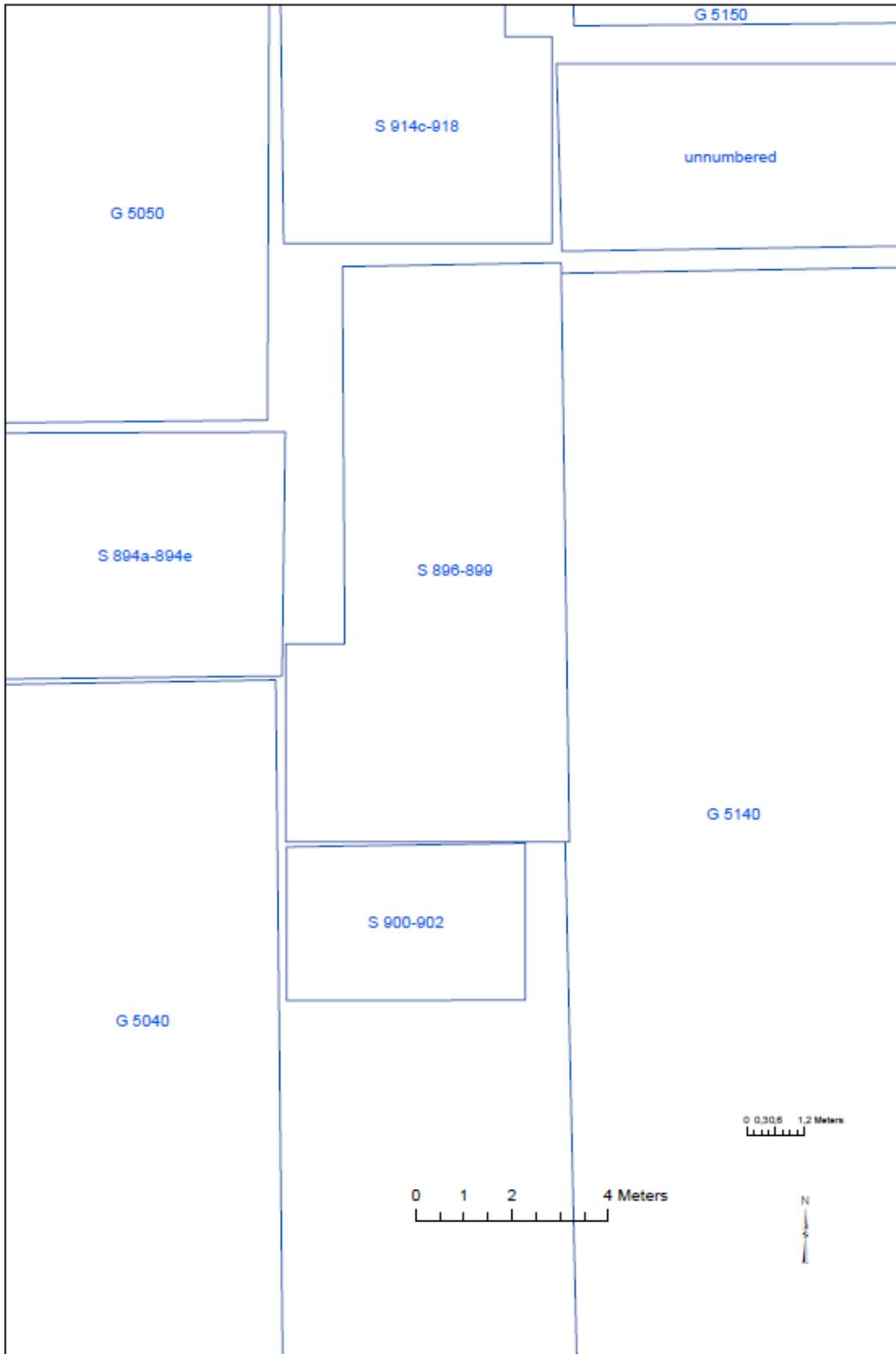
detail of map 3.7: group C of Junker



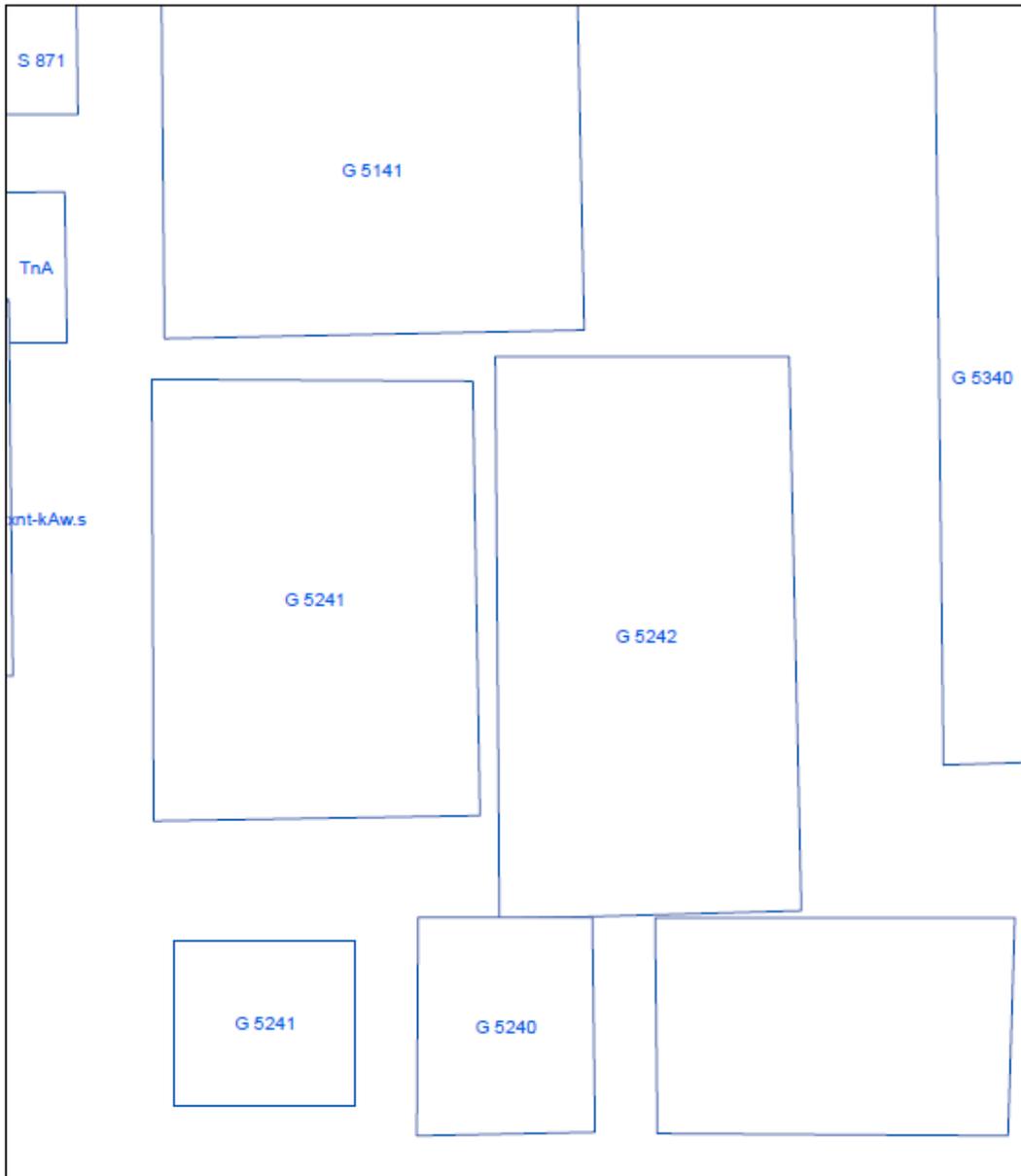
detail of map 3.7: group D of Junker



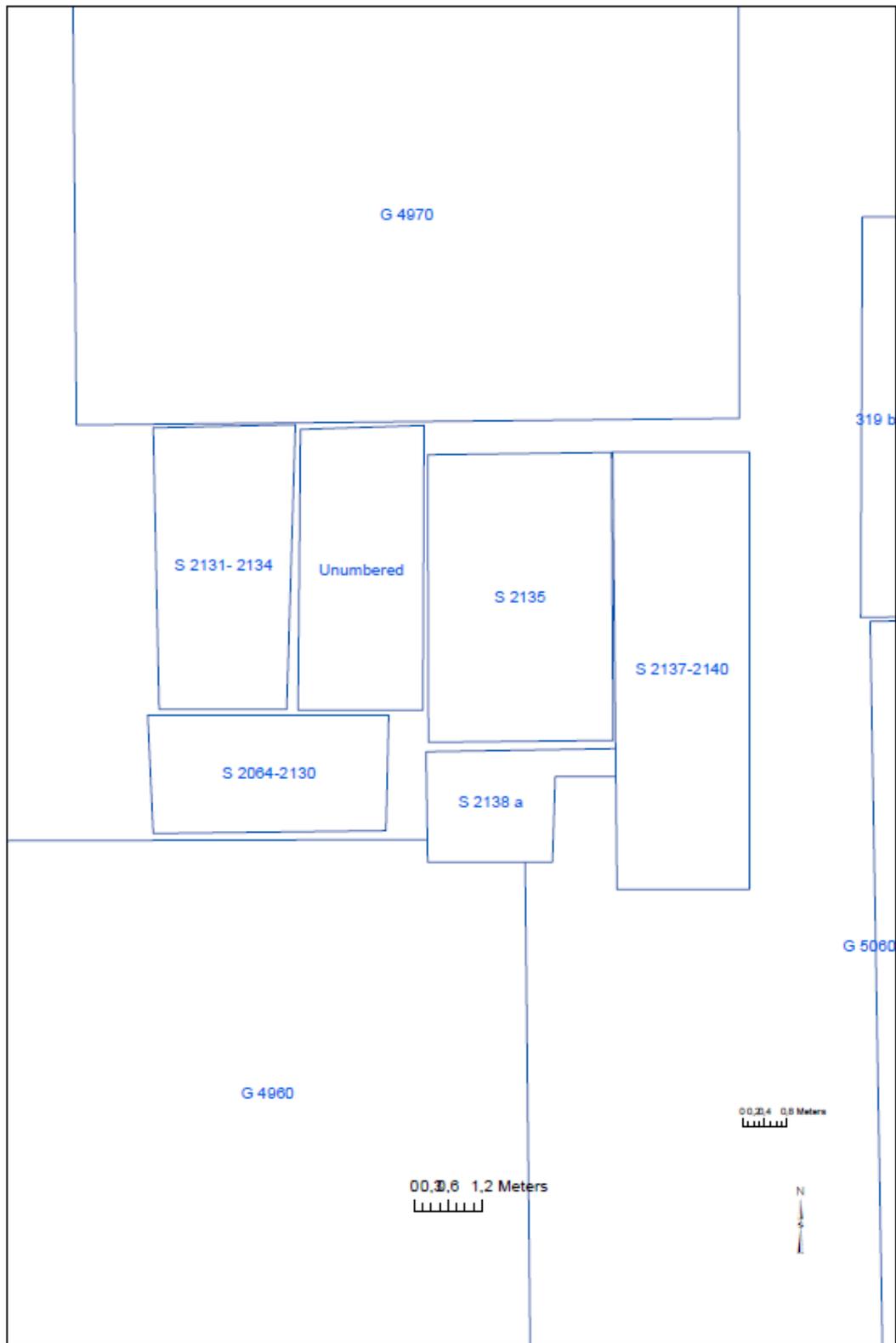
detail of map 3.7: group E of Junker



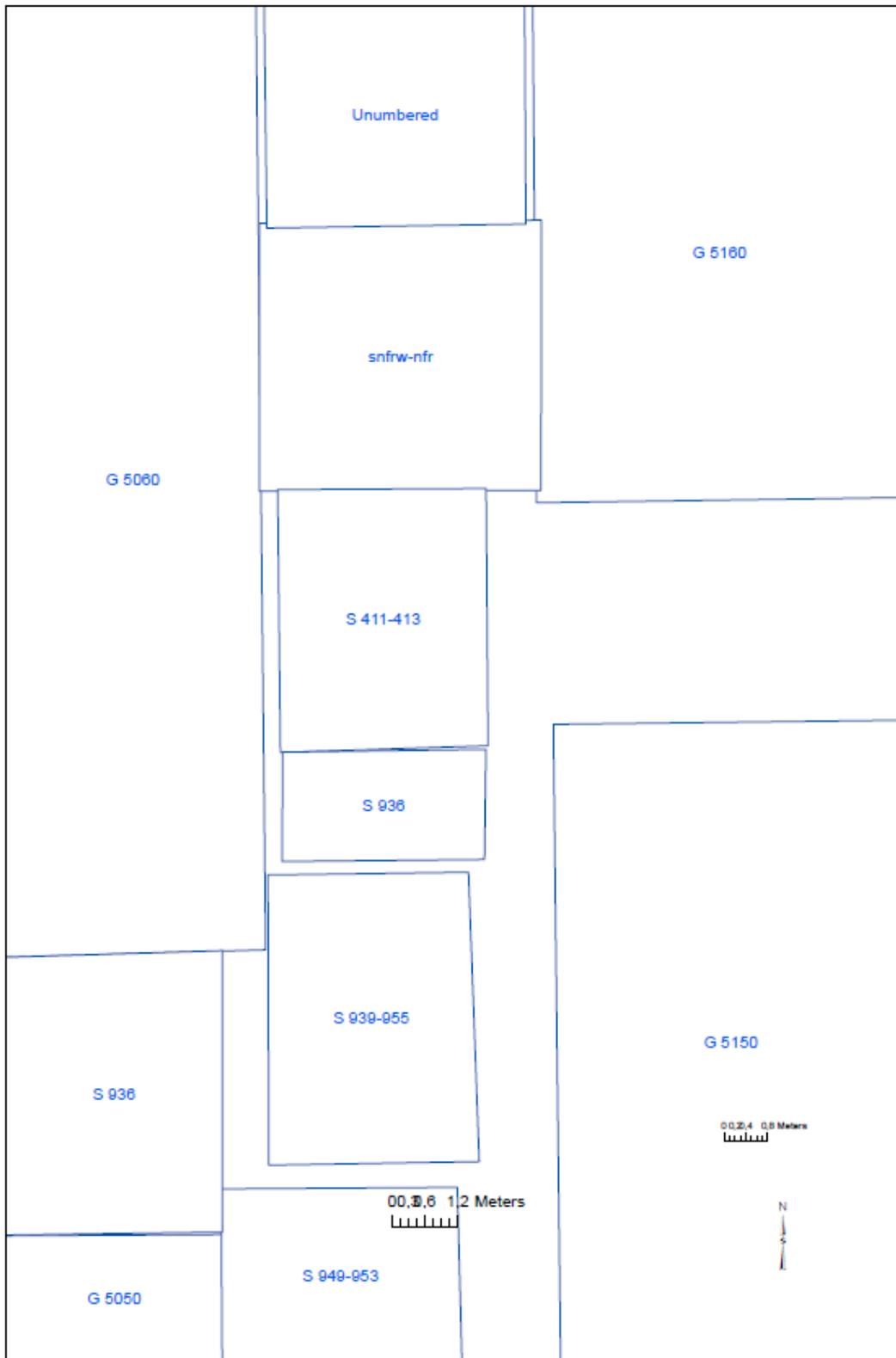
detail of map 3.7: group F of Junker



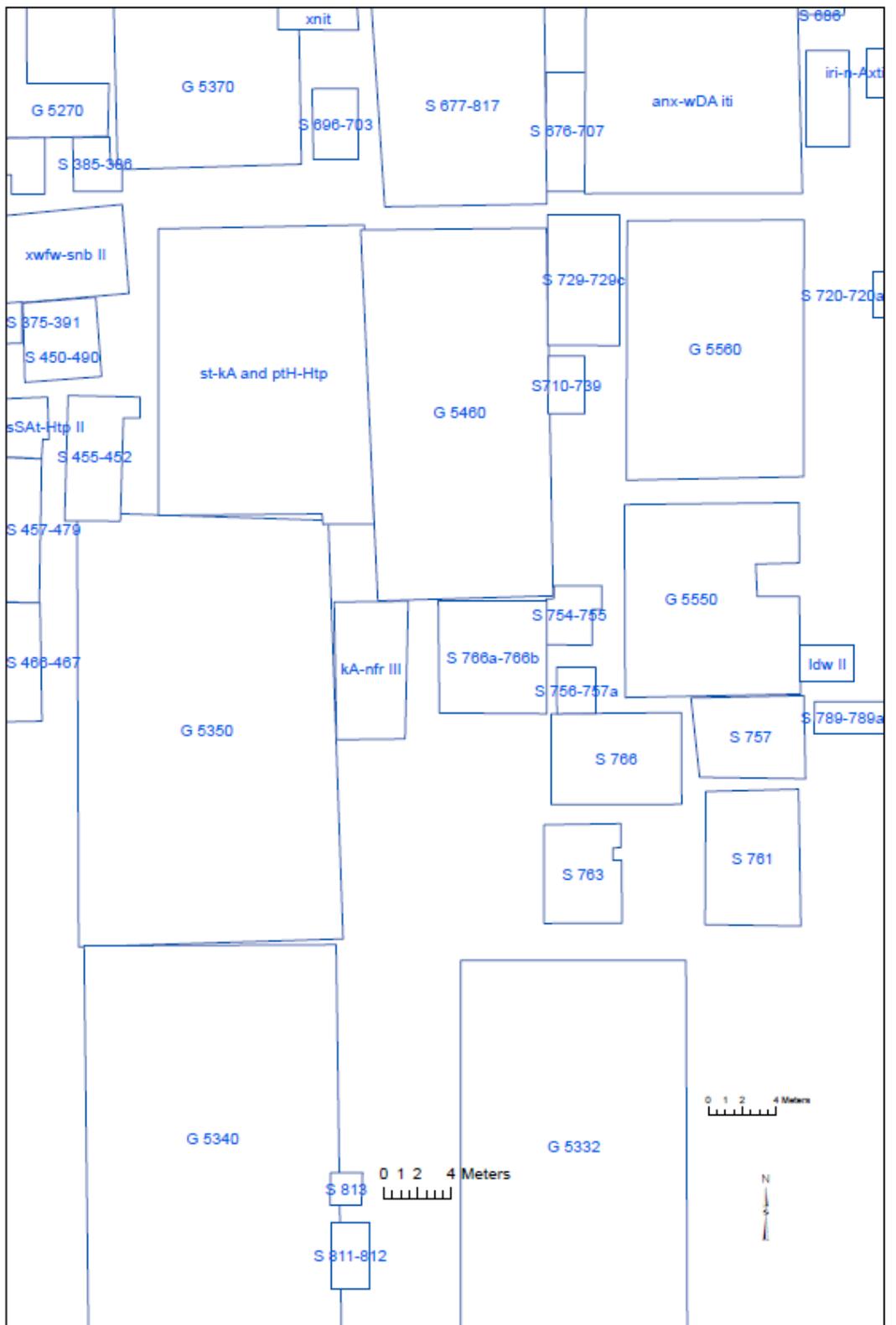
detail of map 3.7:group G of Junker



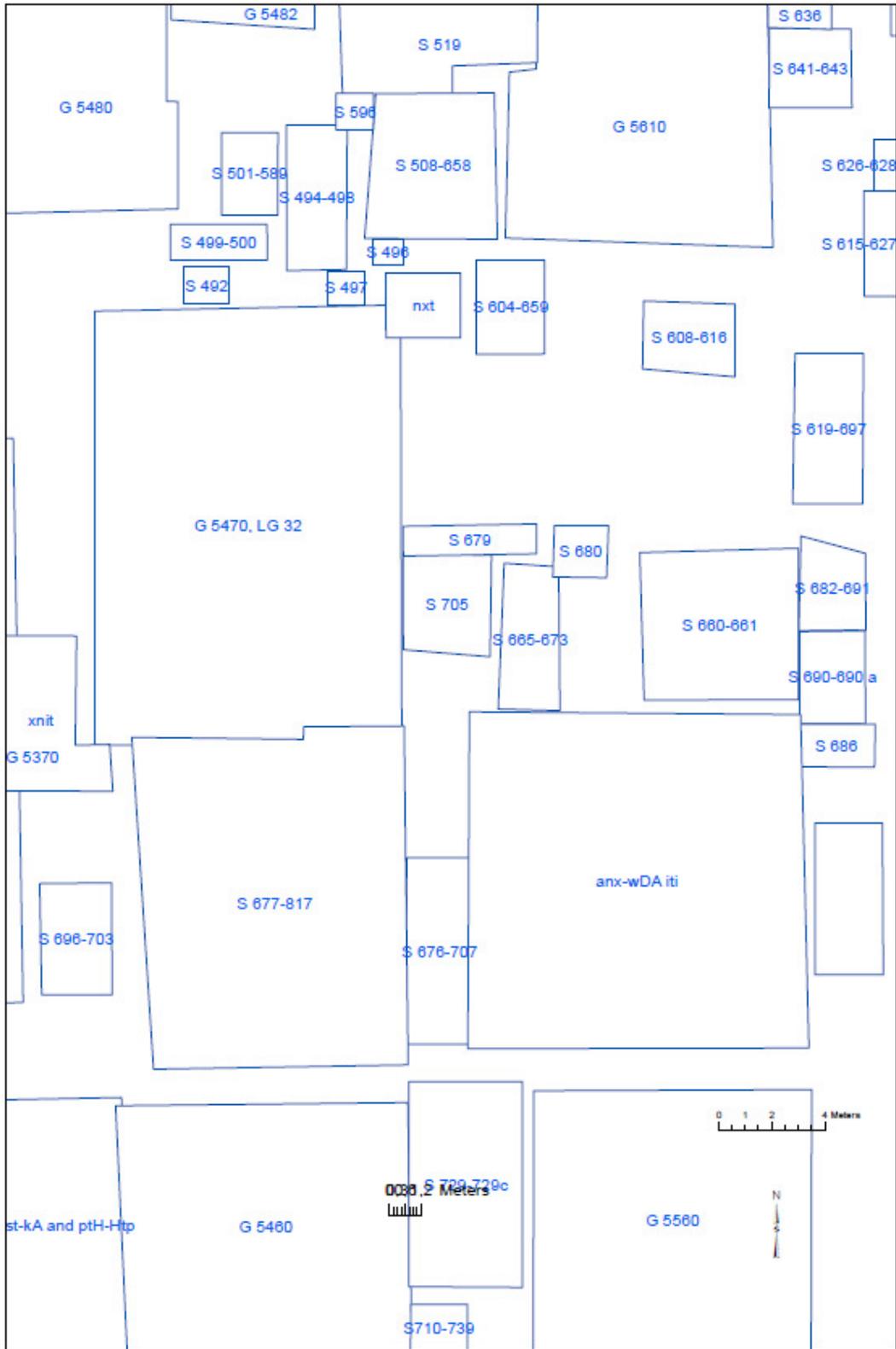
Detail of map 3.7: group H of Junker



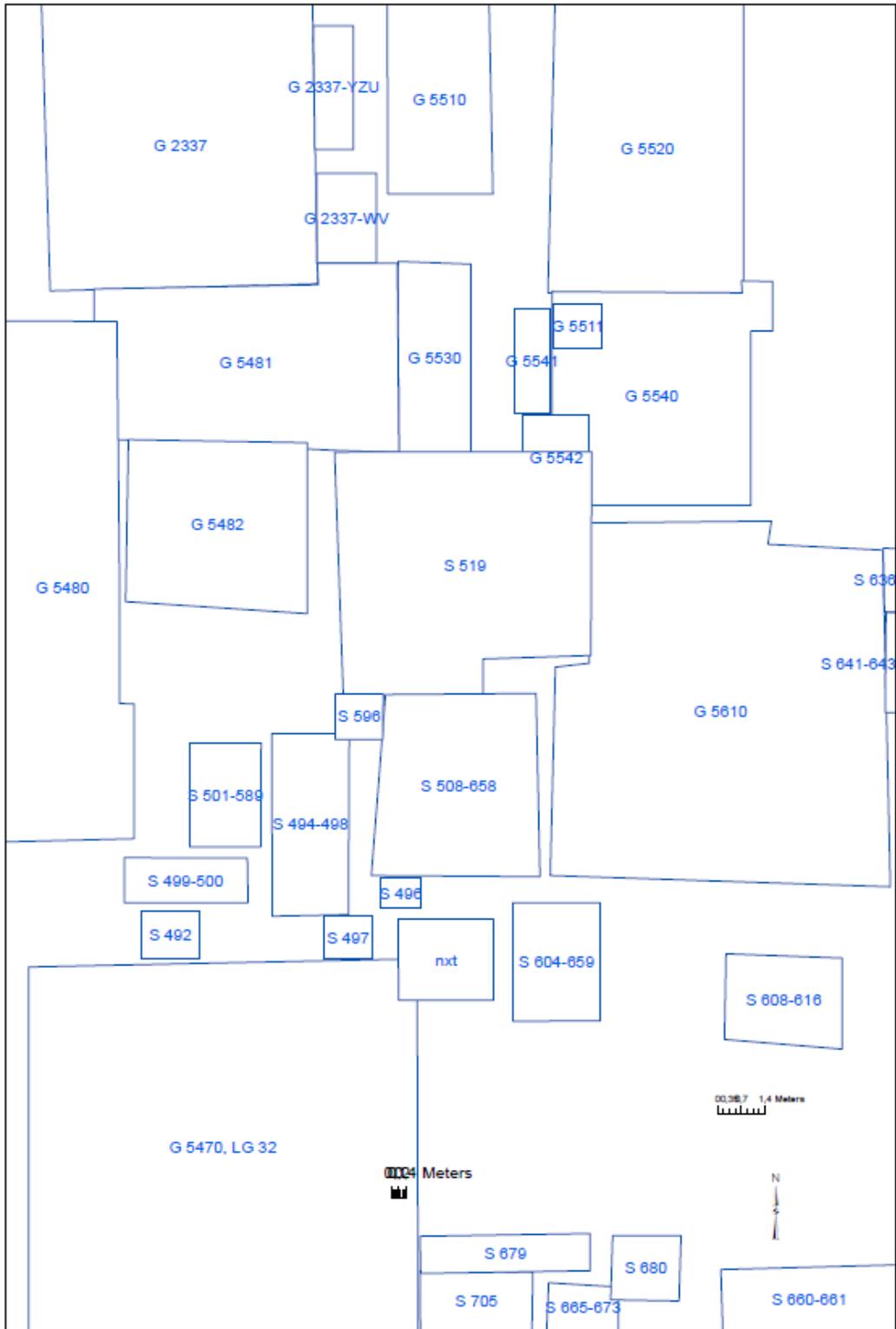
detail of map 3.7: group I of Junker



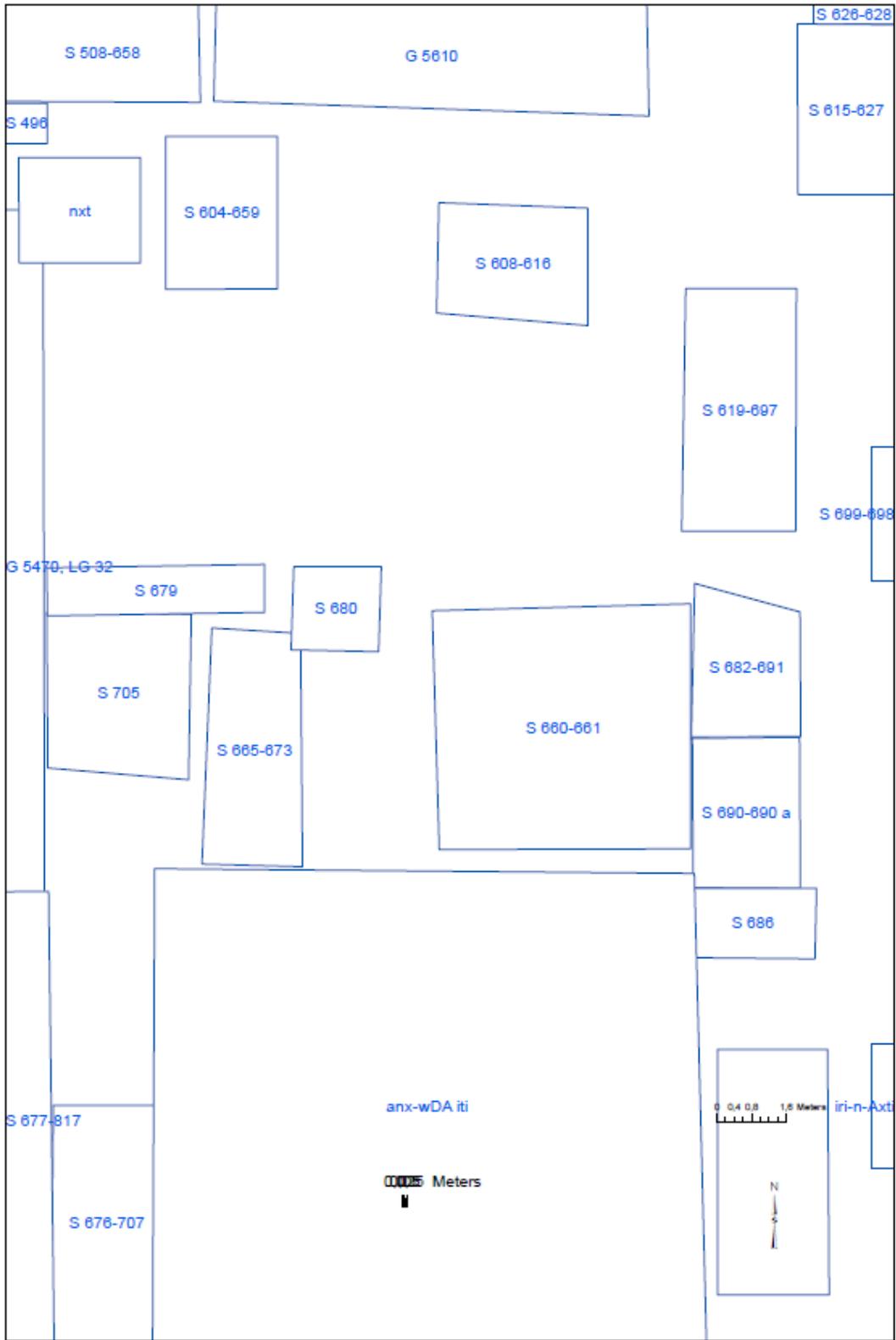
detail of map 3.7: group K of Junker



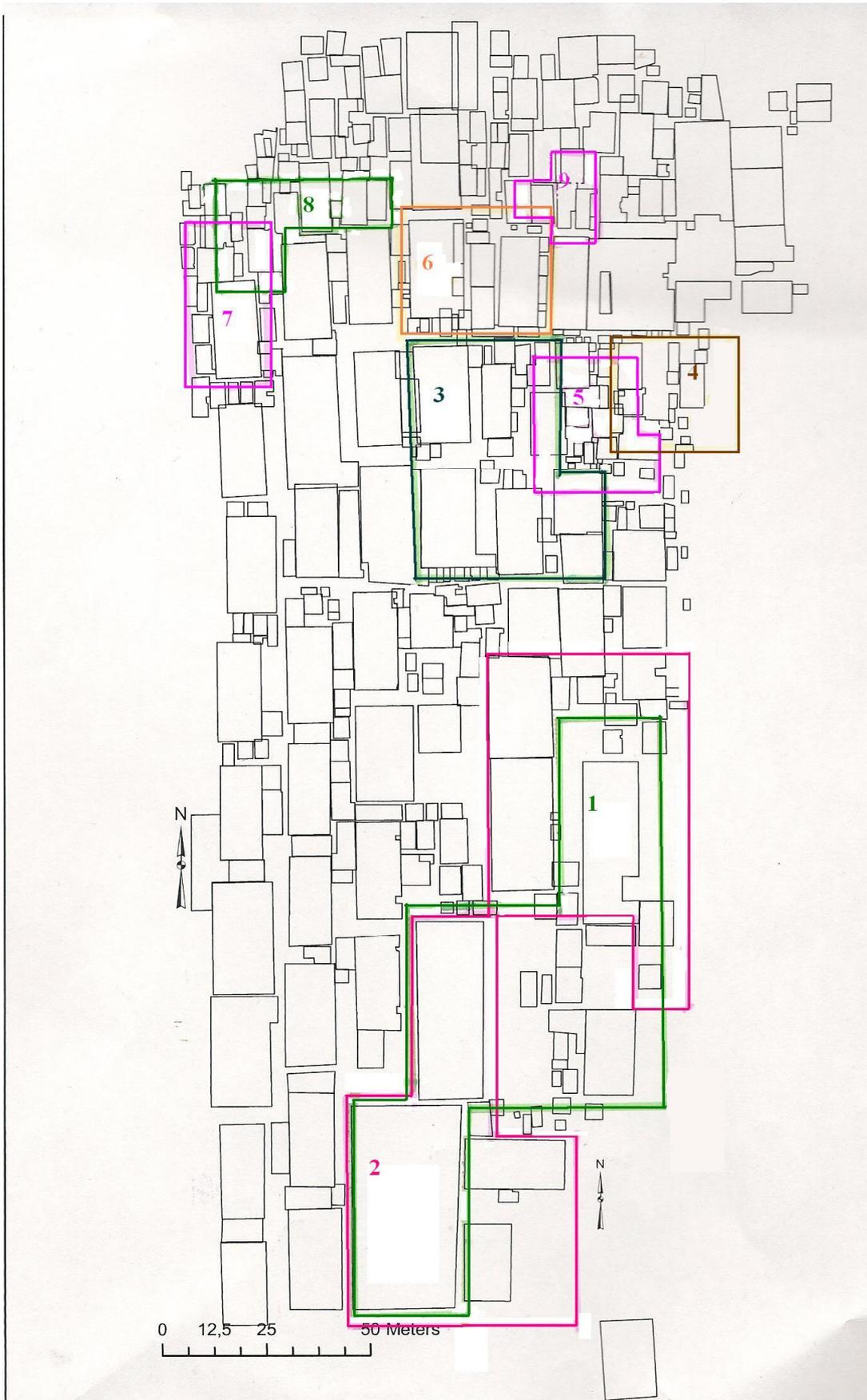
detail of map 3.7: group L of Junker



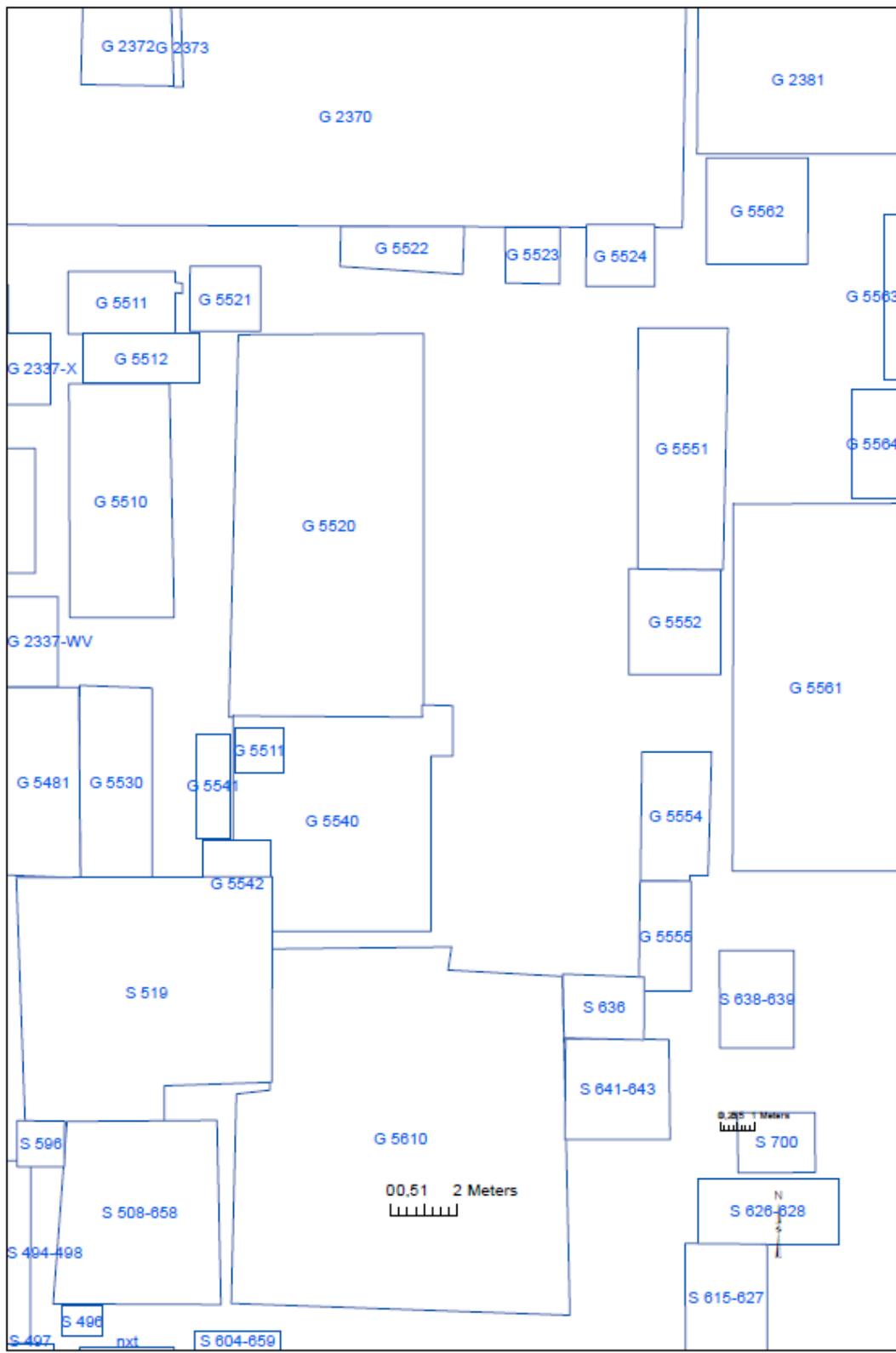
detail of map 3.7: group M of Junker



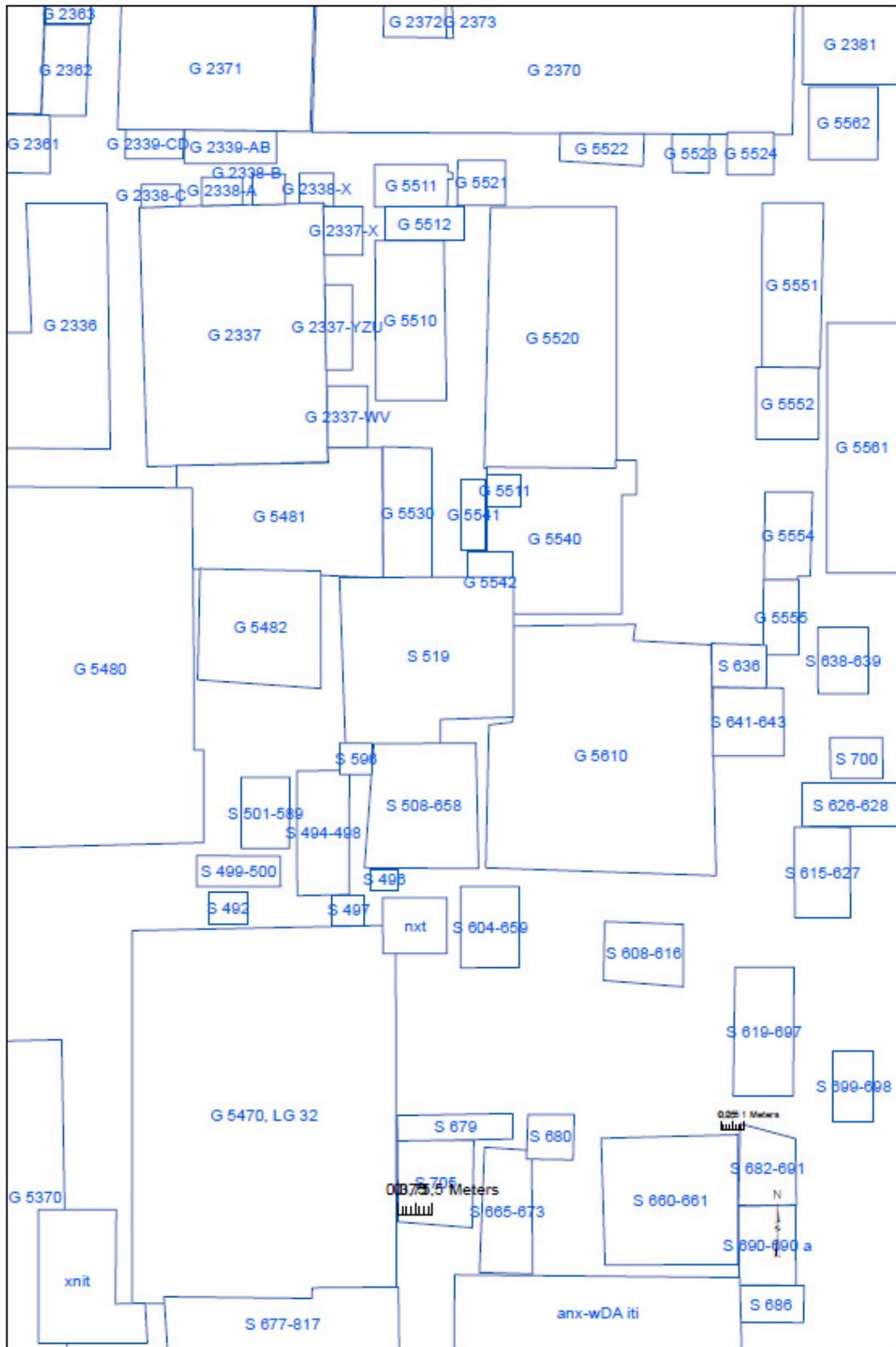
detail of map 3.7: group N of Junker



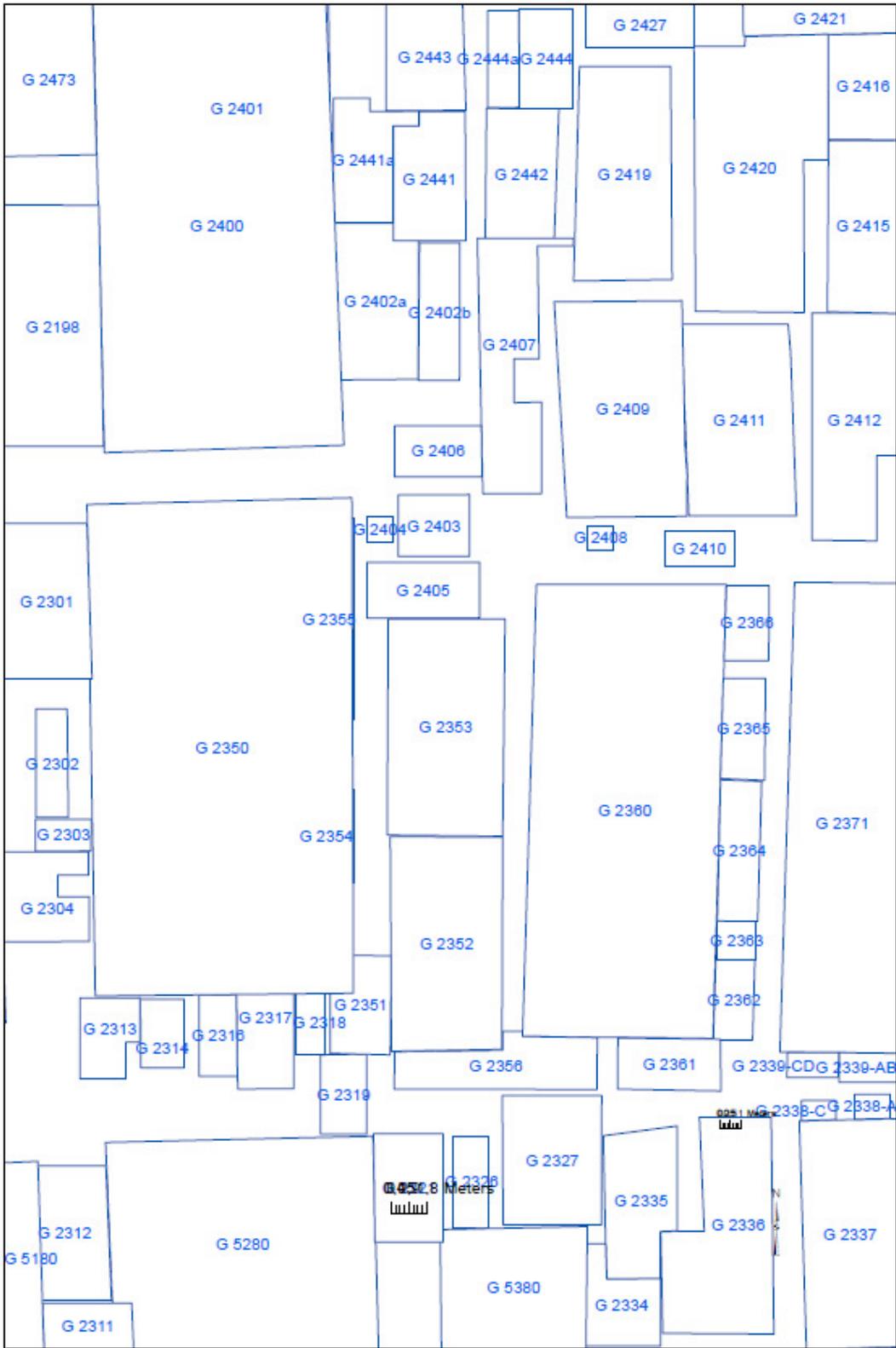
Map 3.8: Key map of sequence of building according to Reisner



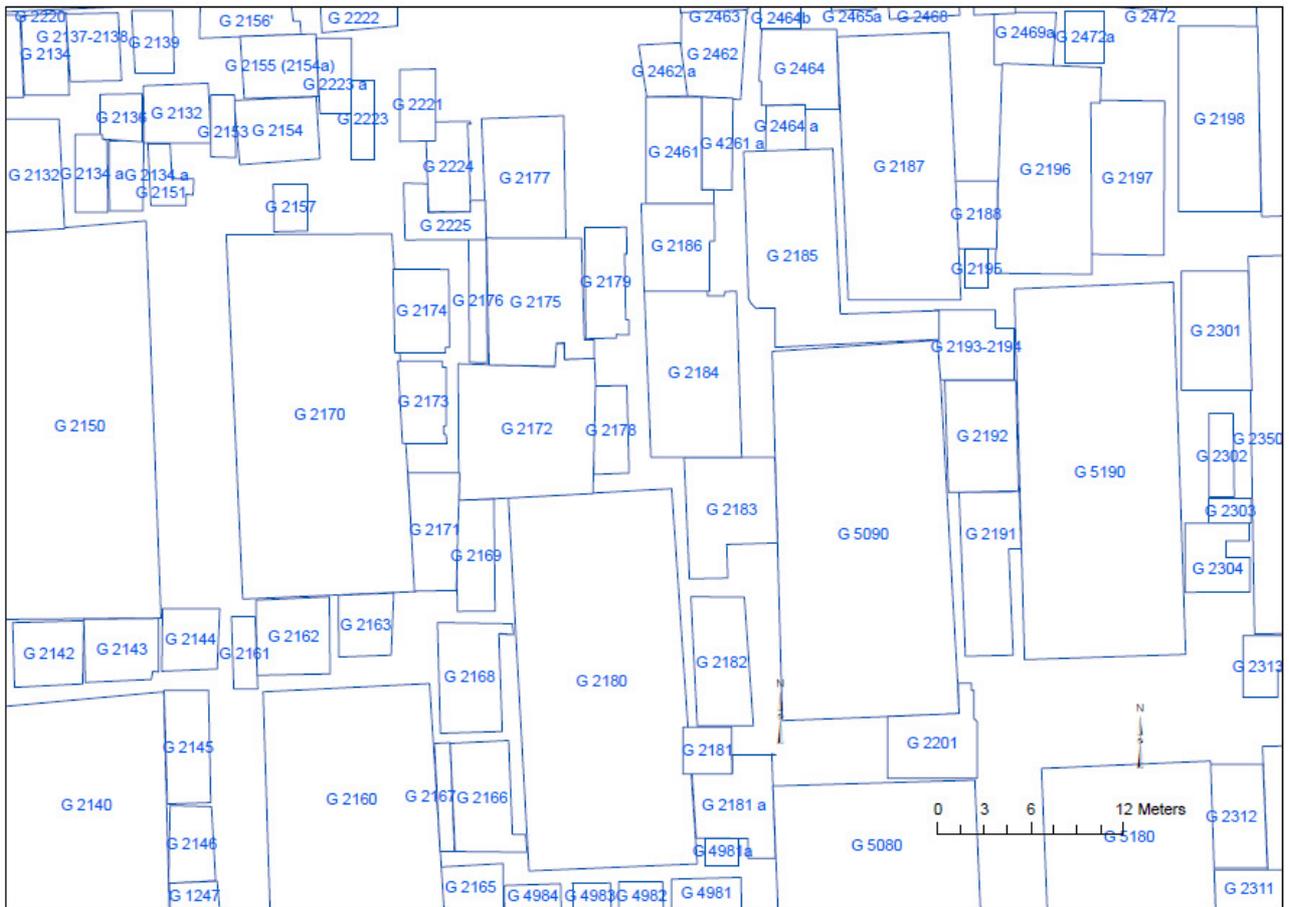
Detail of map 3.8: group 4 of Reisner



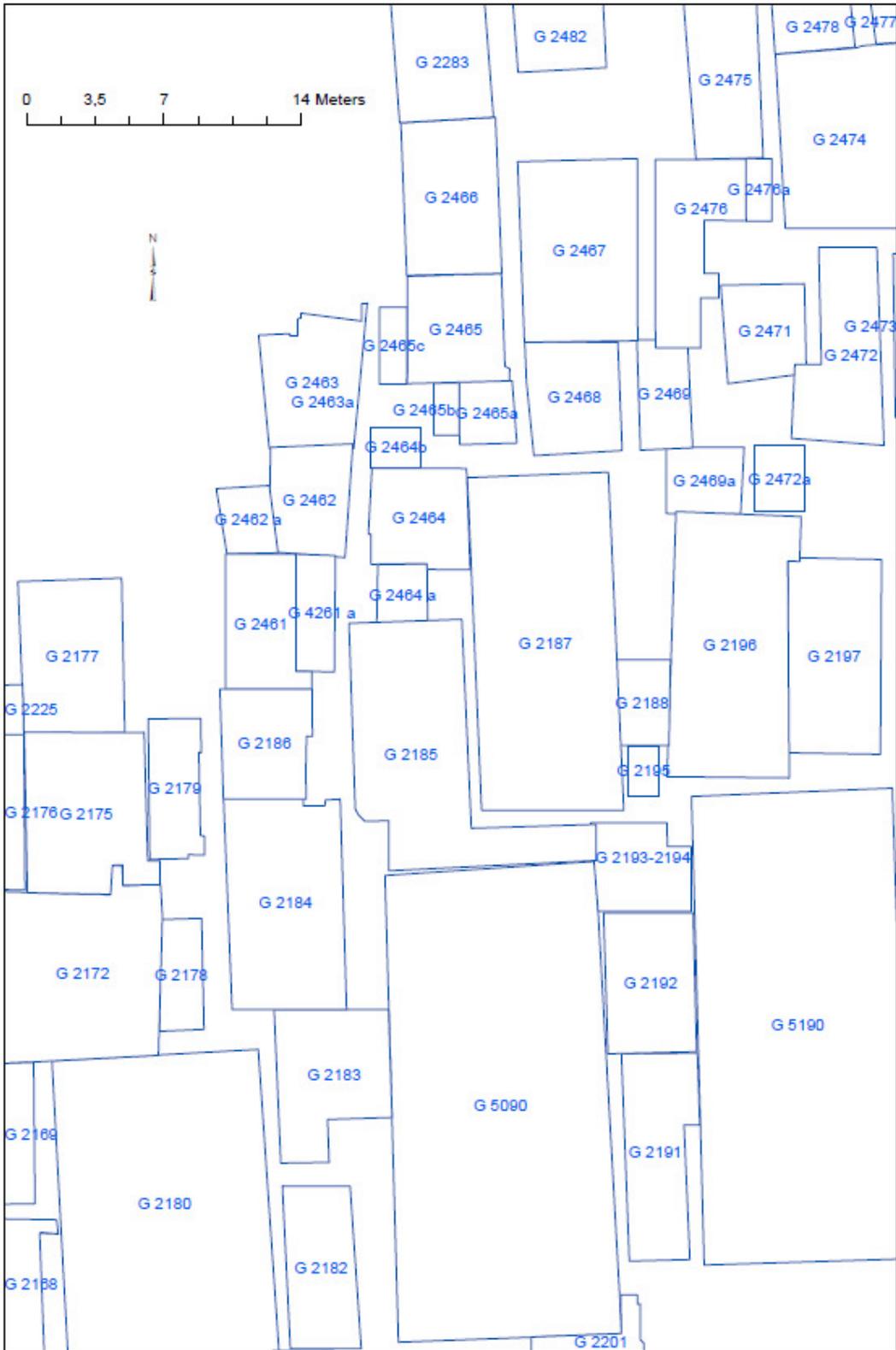
Detail of map 3.8: group 5 of Reisner



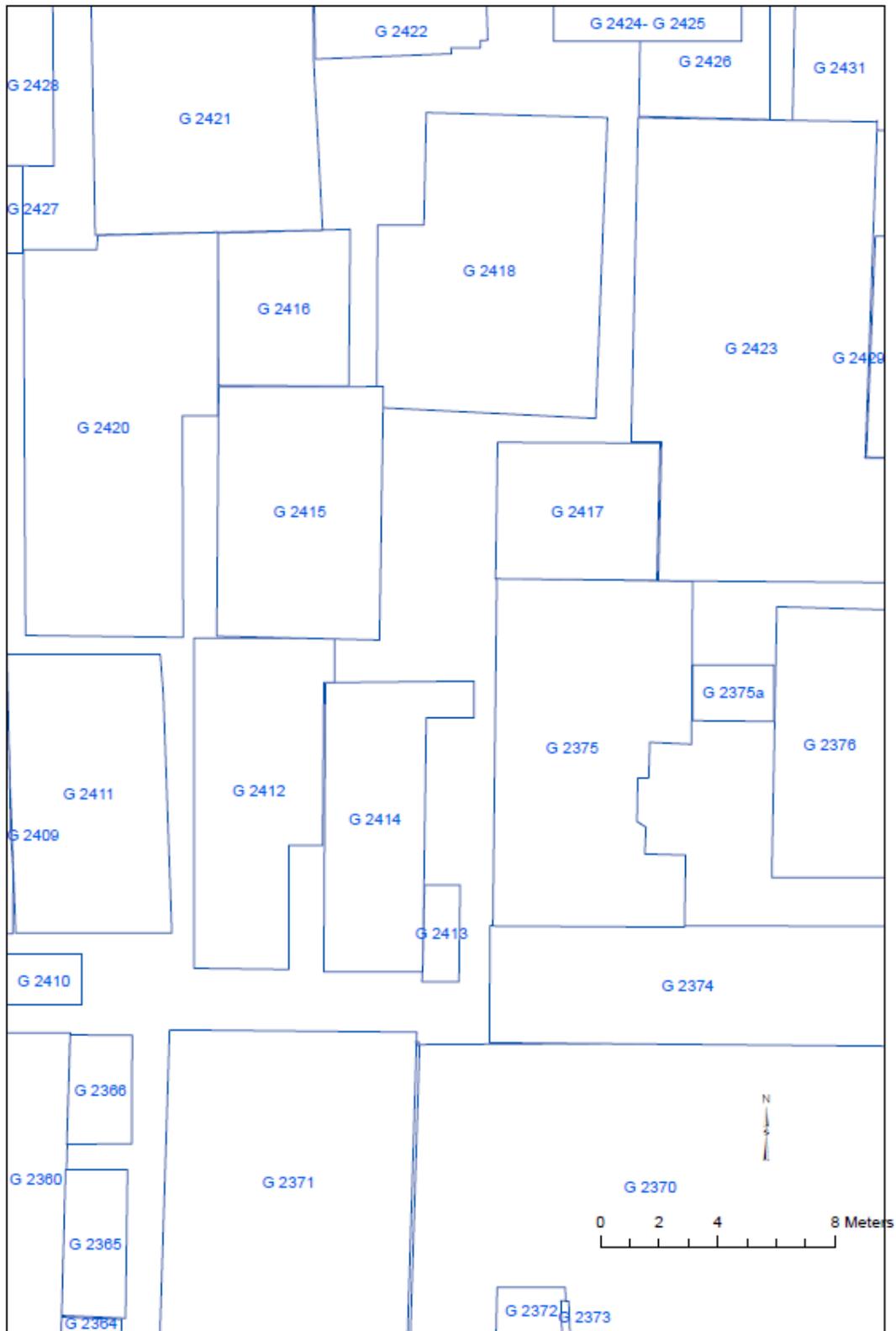
Detail of map 3.8: group 6 of Reisner



Detail of map 3.8: group 7 of Reisner



Detail of map 3.8: group 8 of Reisner



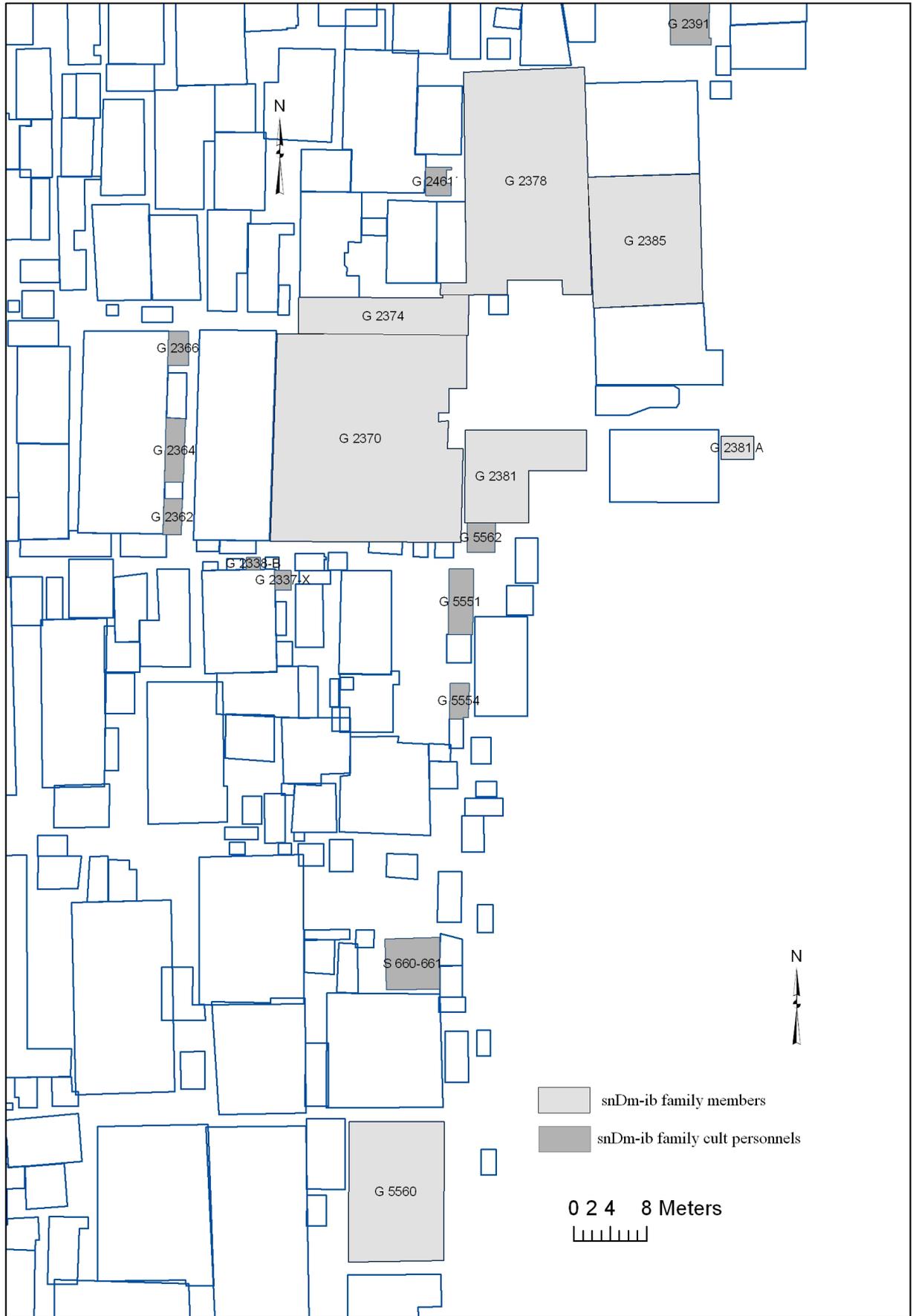
Detail of map 3.8: group 9 of Reisner



Map 4.1: *sSm-nfr* family members buried in CEE



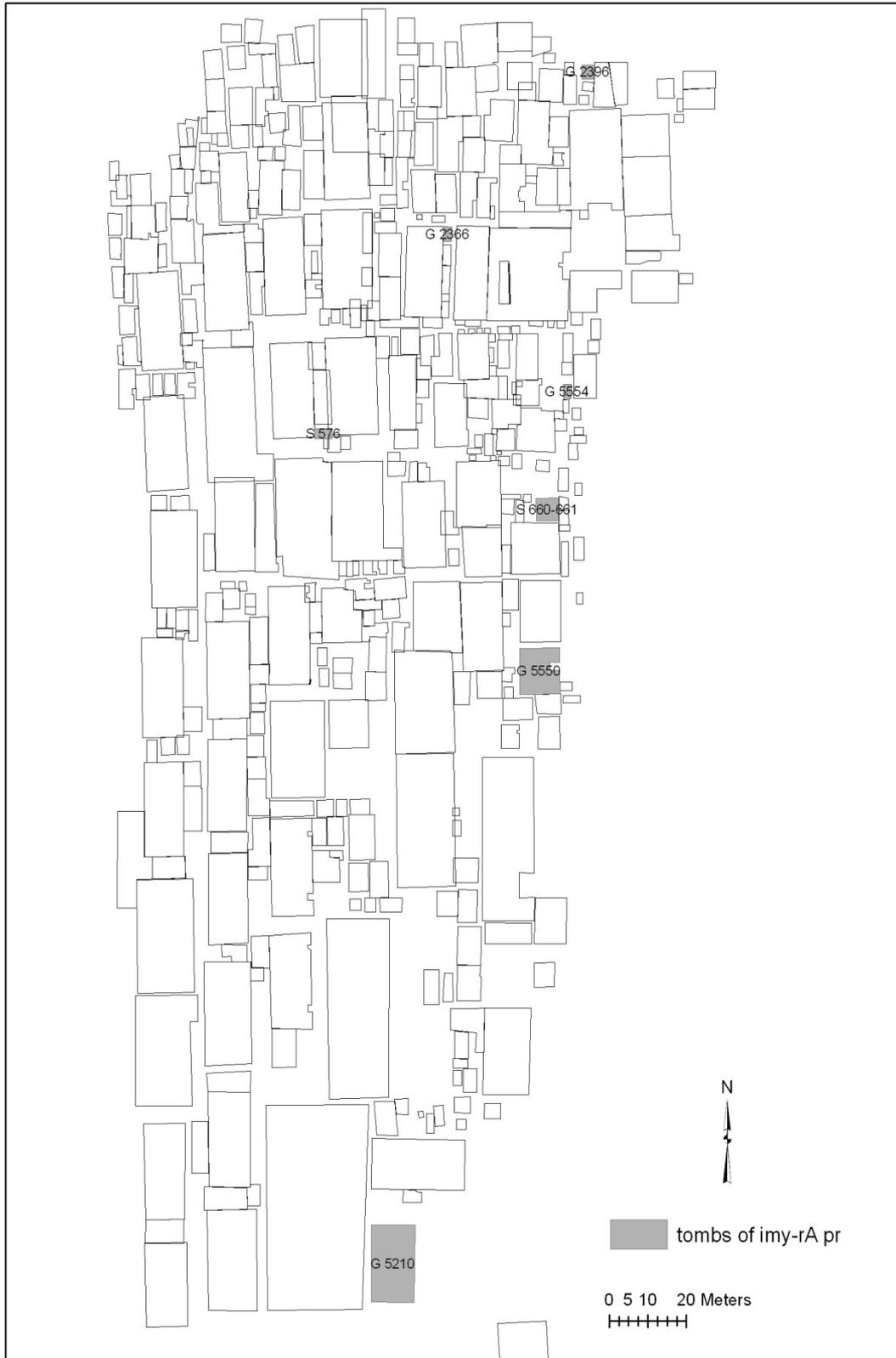
Map 4.2: *k3-n-nswt* family tombs



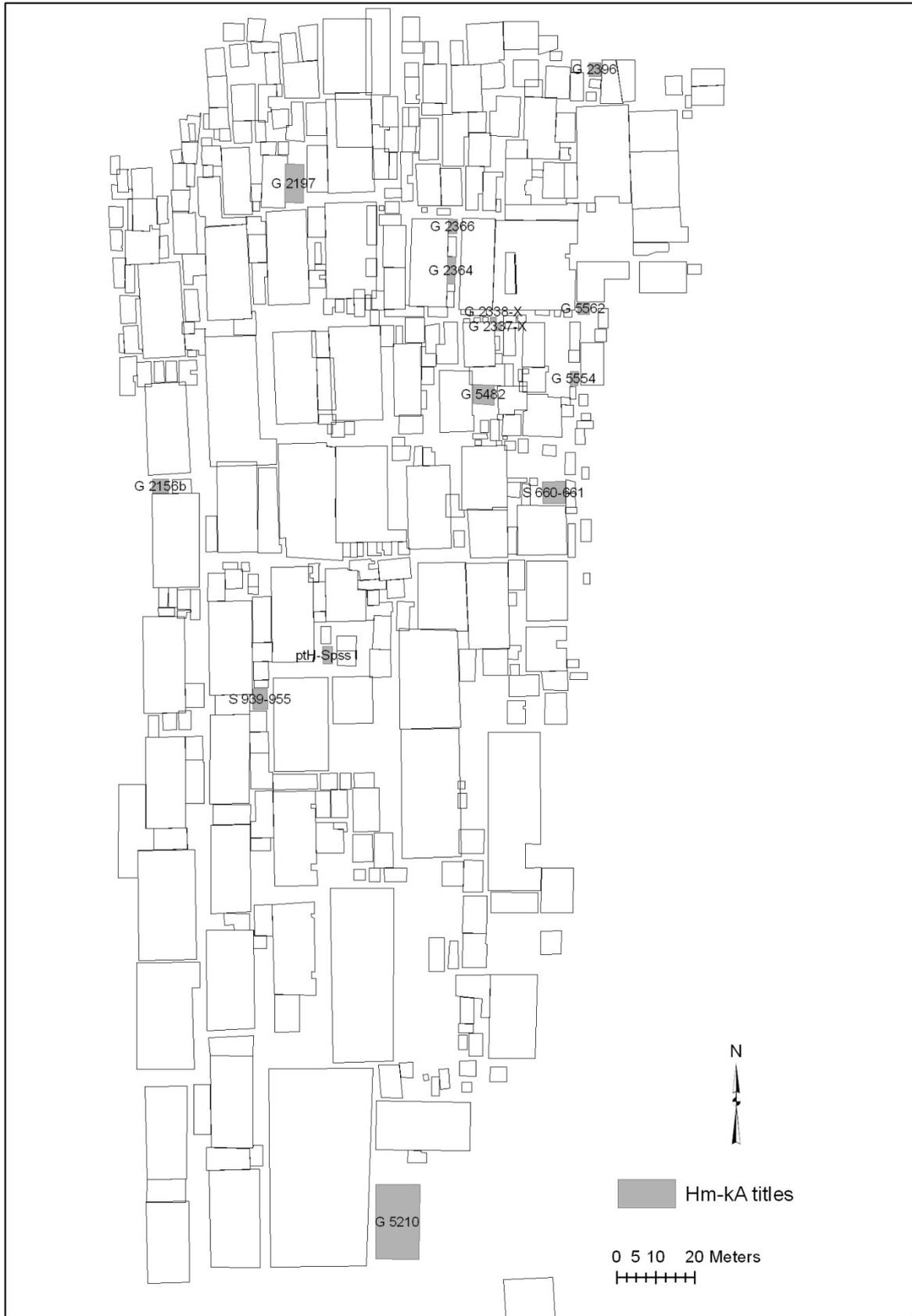
Map 4.3: tombs of *snDm-ib* family members and their cult personnel



Map 4.4: tombs of holders of *imy-r³ sšr* title



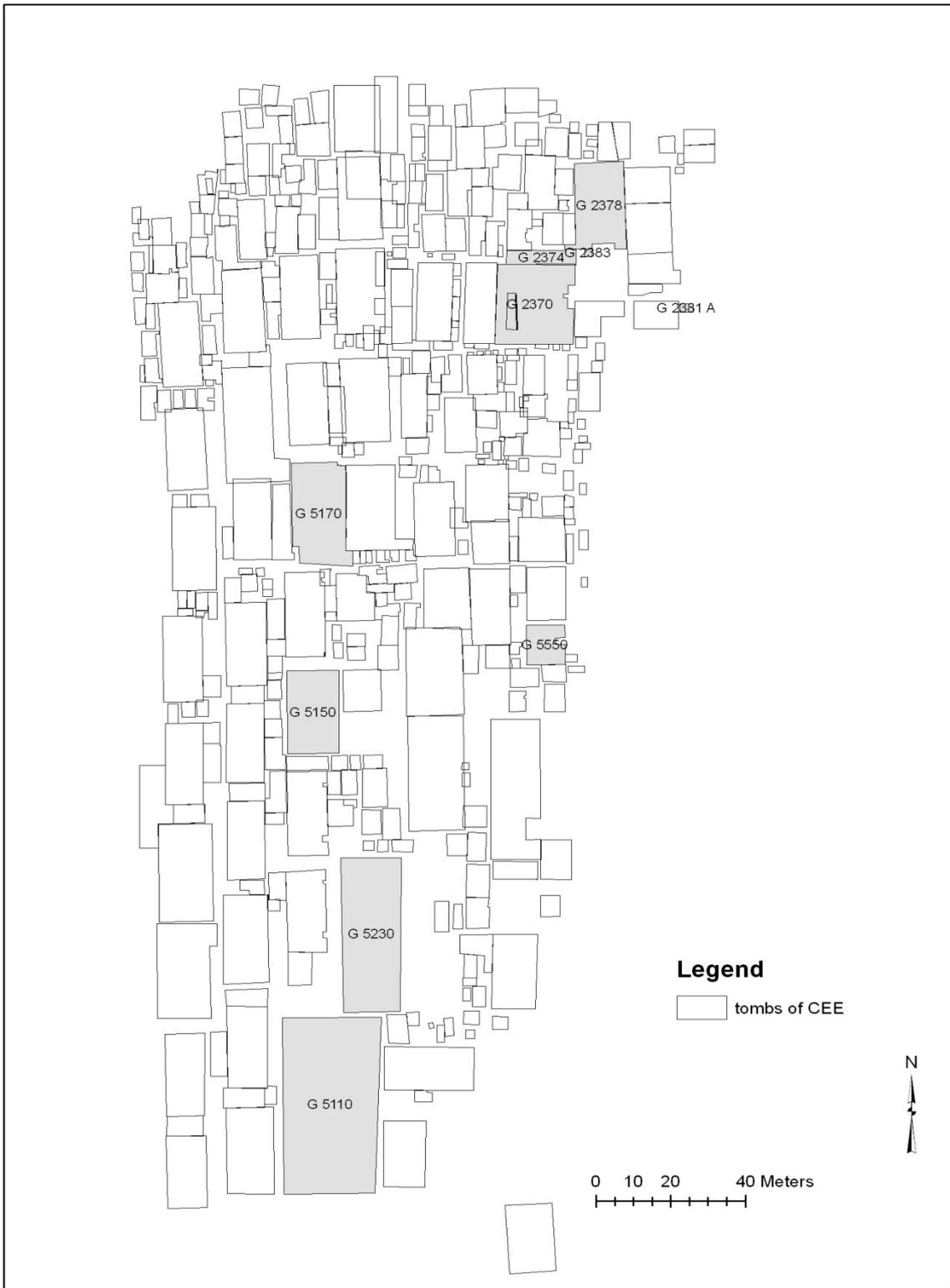
Map 4.5: tombs of holders of *imy-r3 pr* title



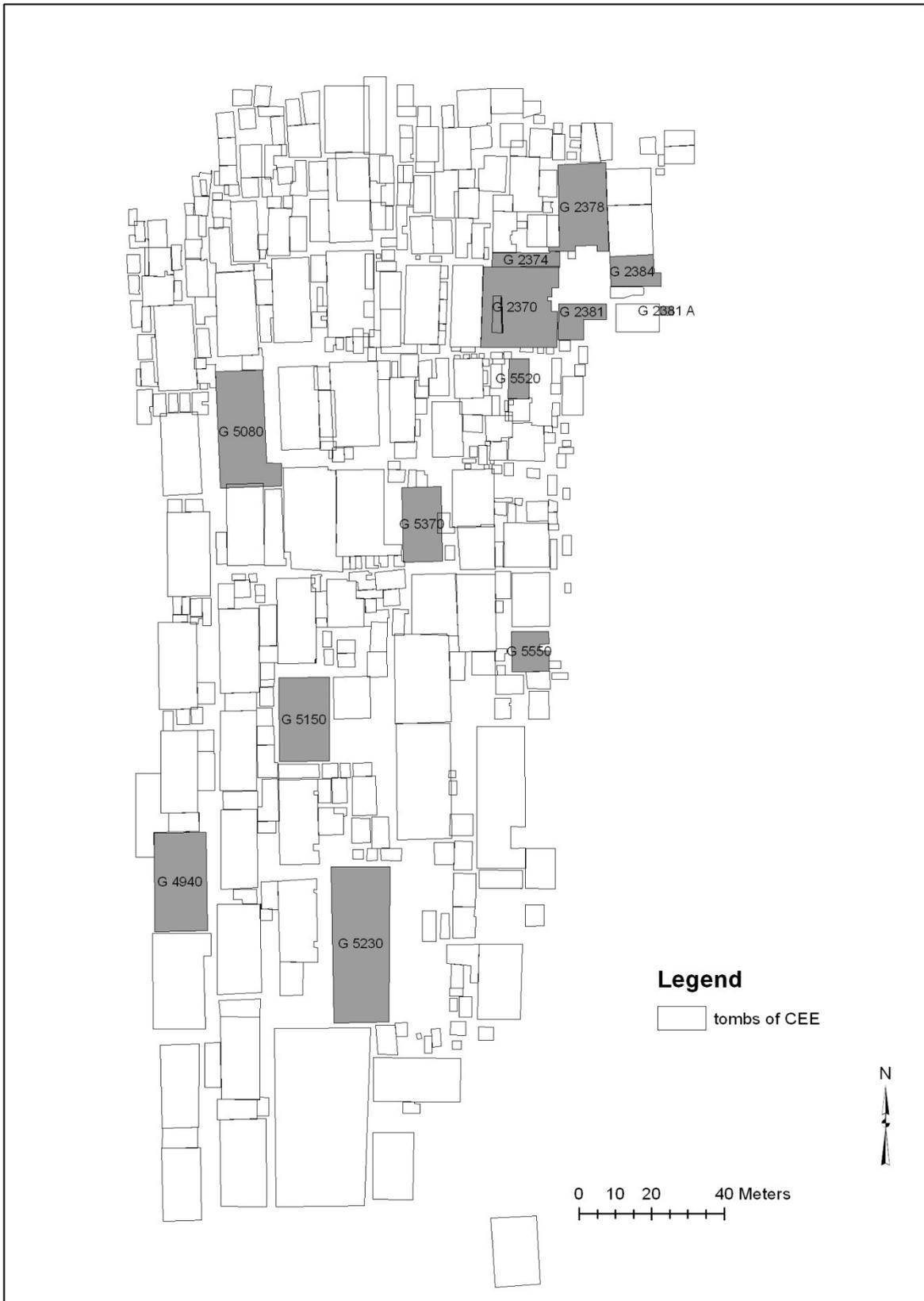
Map 4.6: tombs of holders of *hm-k3* titles



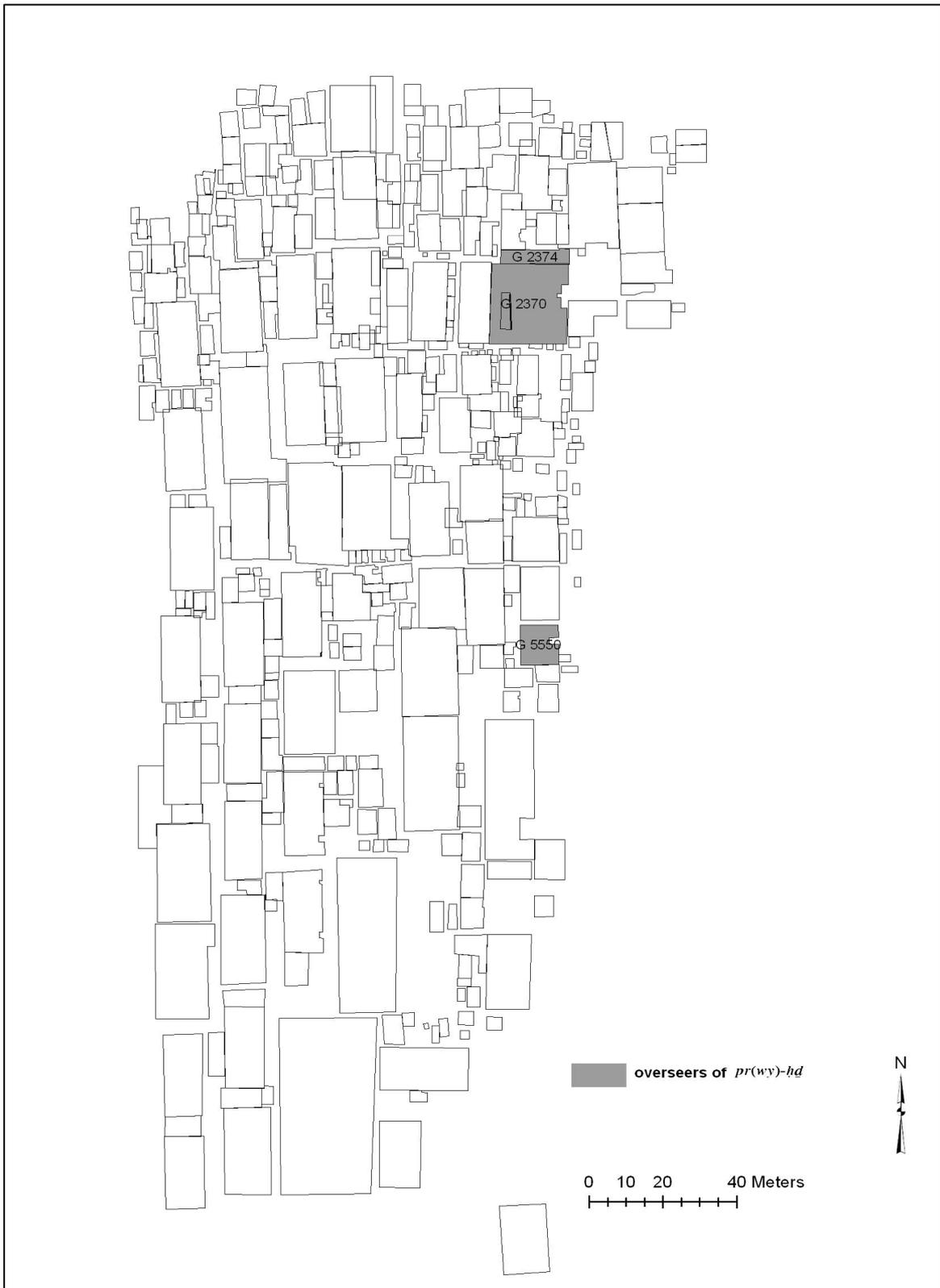
Map 4.7: tombs in which a *hm-k3* priest is represented



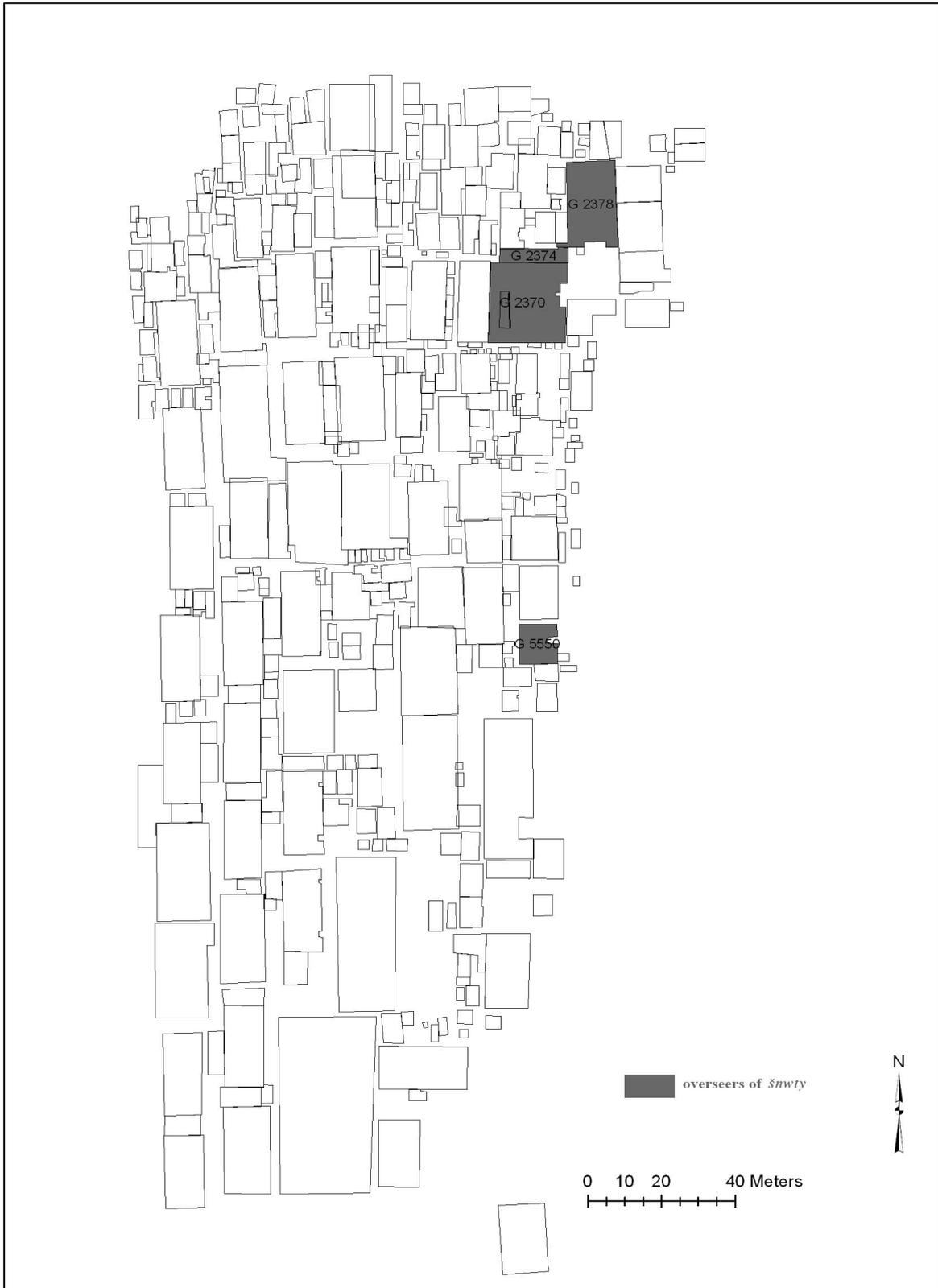
Map 5.1: Distribution of tombs of viziers



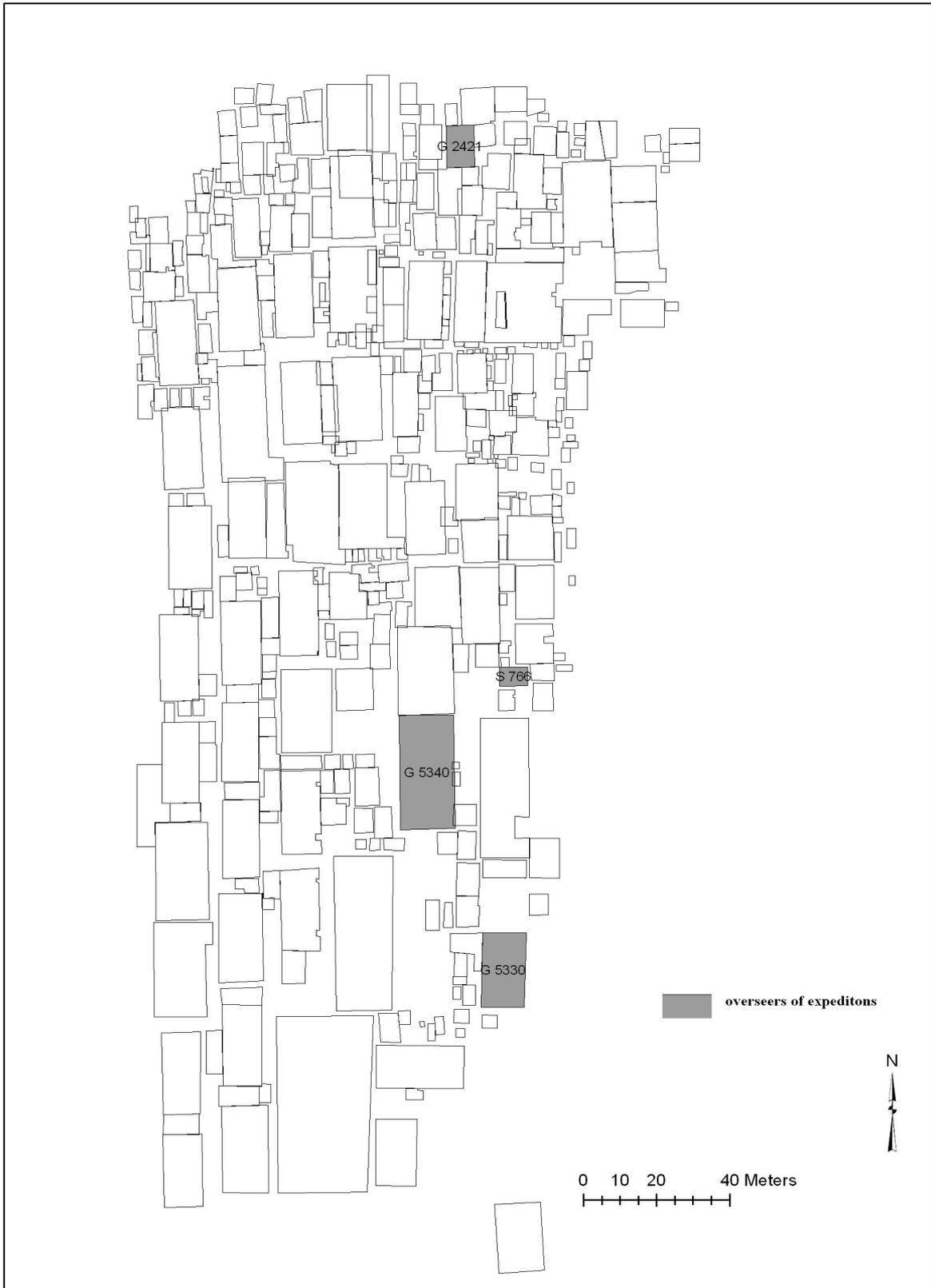
Map 5.2: Distribution of tombs of directors of work



Map 5.3: Distribution of tombs of the overseers of *pr(wy)-hd*



Map 5.4: Distribution of tombs of the overseers of Snwty



Map 5.5: Distribution of tombs of overseers of expeditions



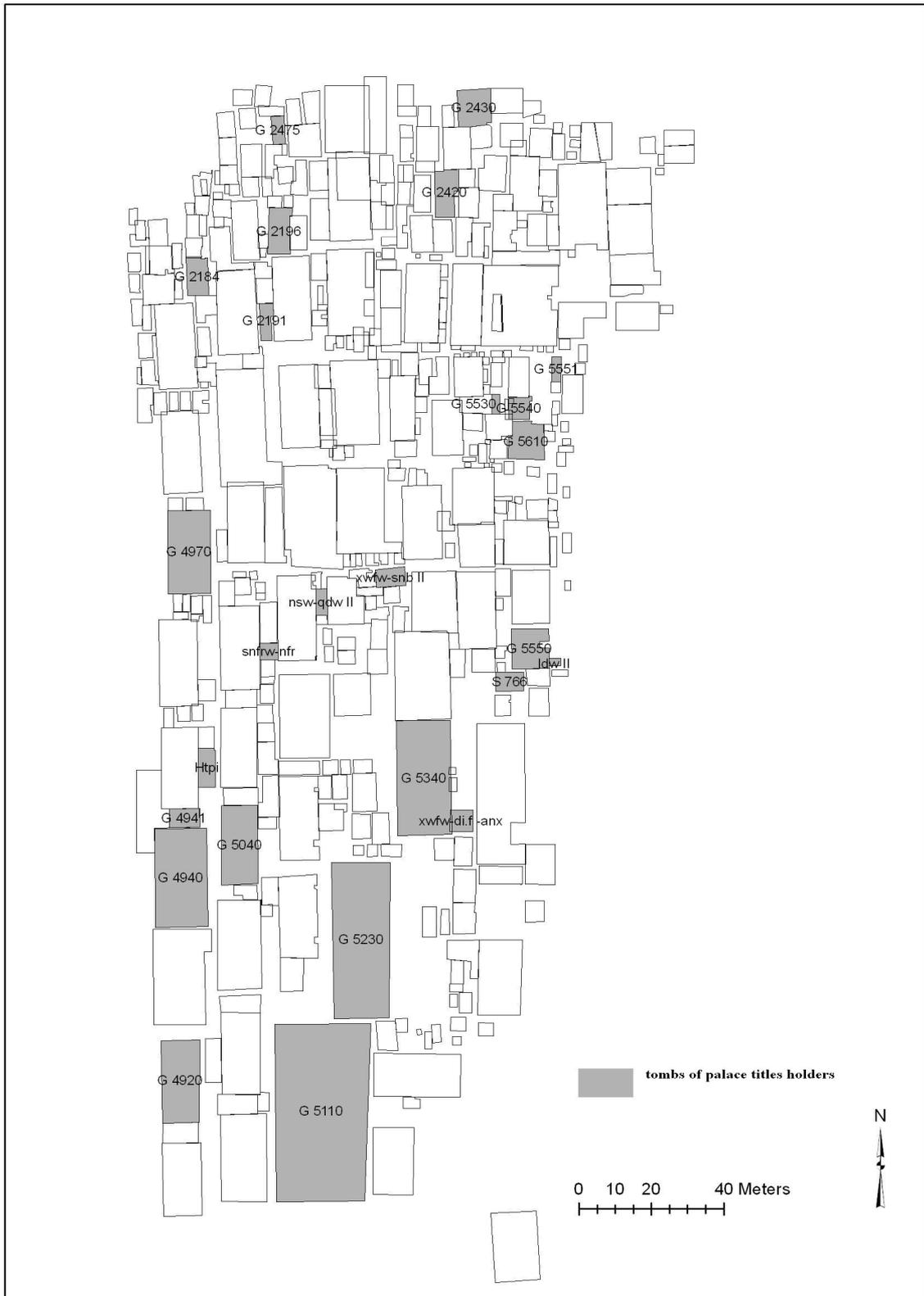
Map 5.6: Distribution of tombs of labour titles holders



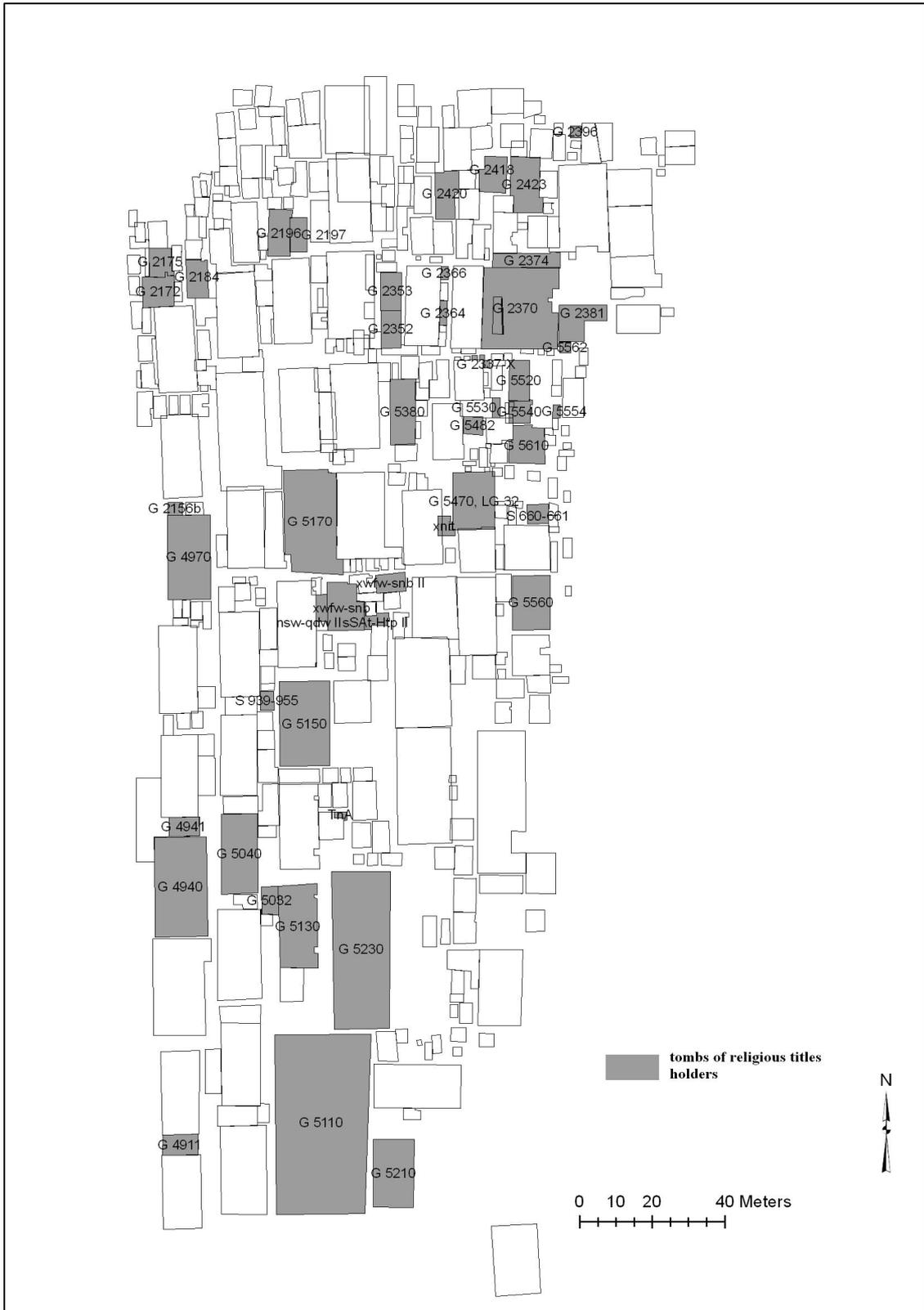
Map 5.7: Distribution of tombs of scribes



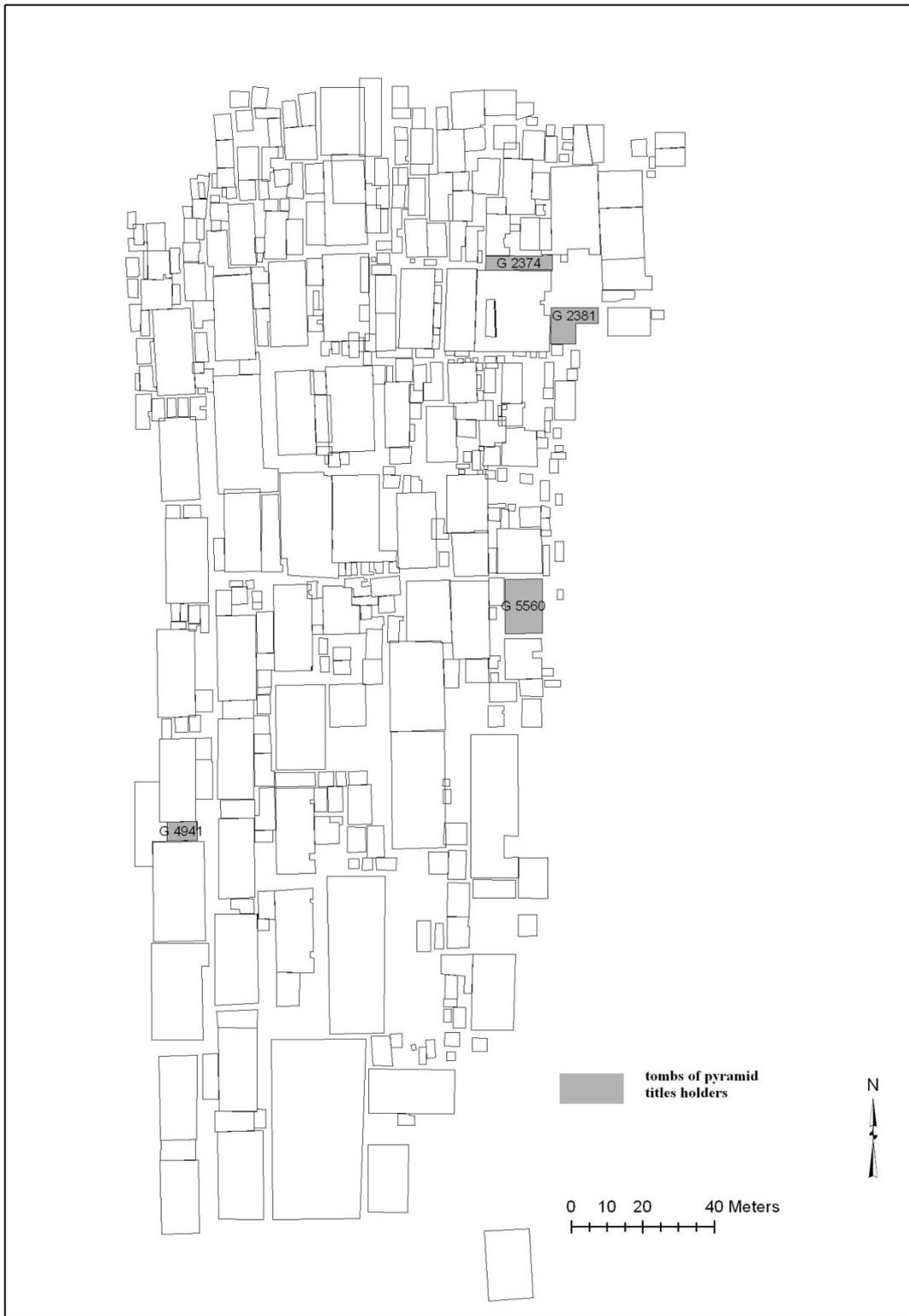
Map 5.8: Distribution of tombs of legal titles holders



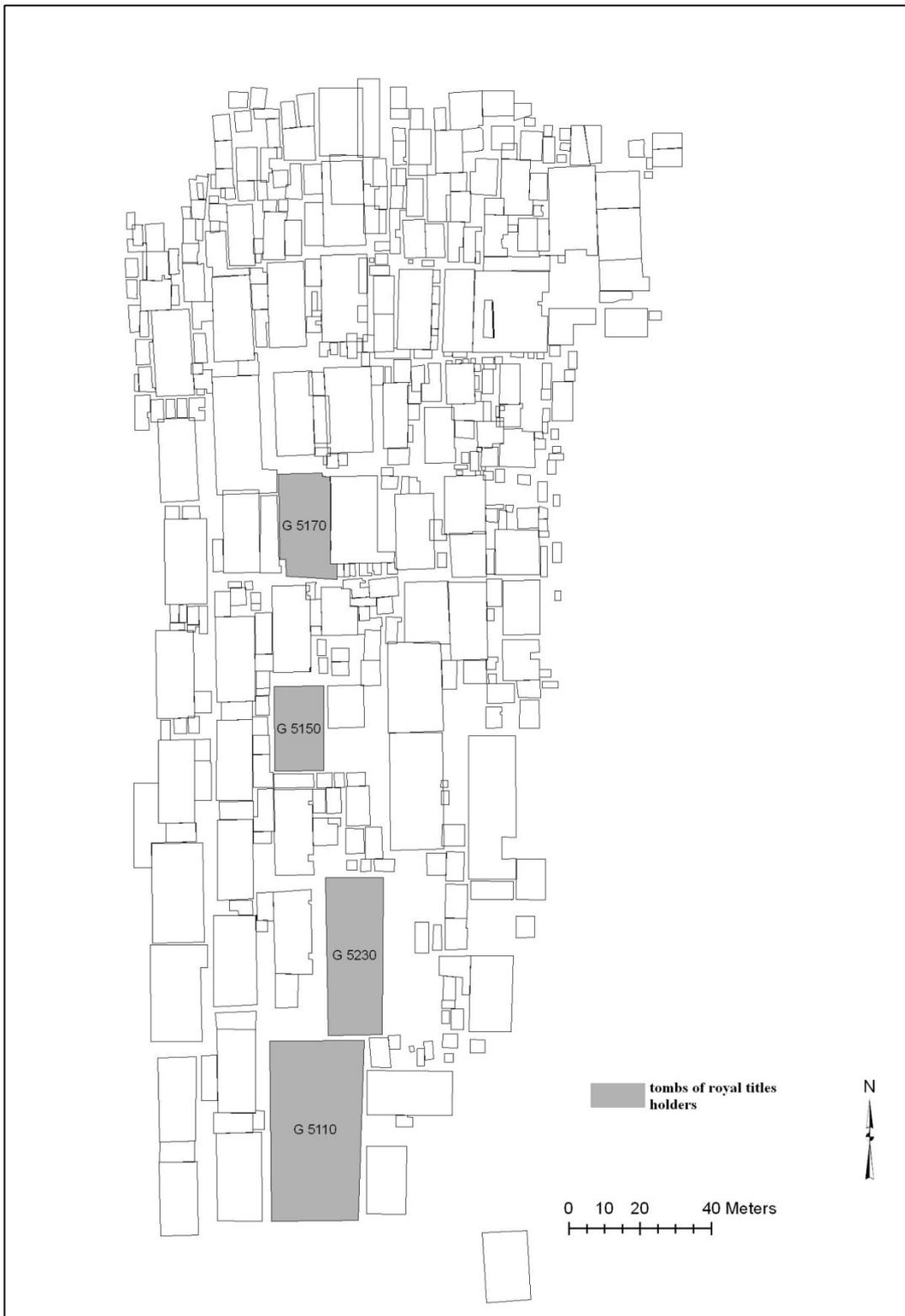
Map 5. 9: Distribution of tombs of palace titles holders



Map 5.10: Distribution of tombs of religious titles holders



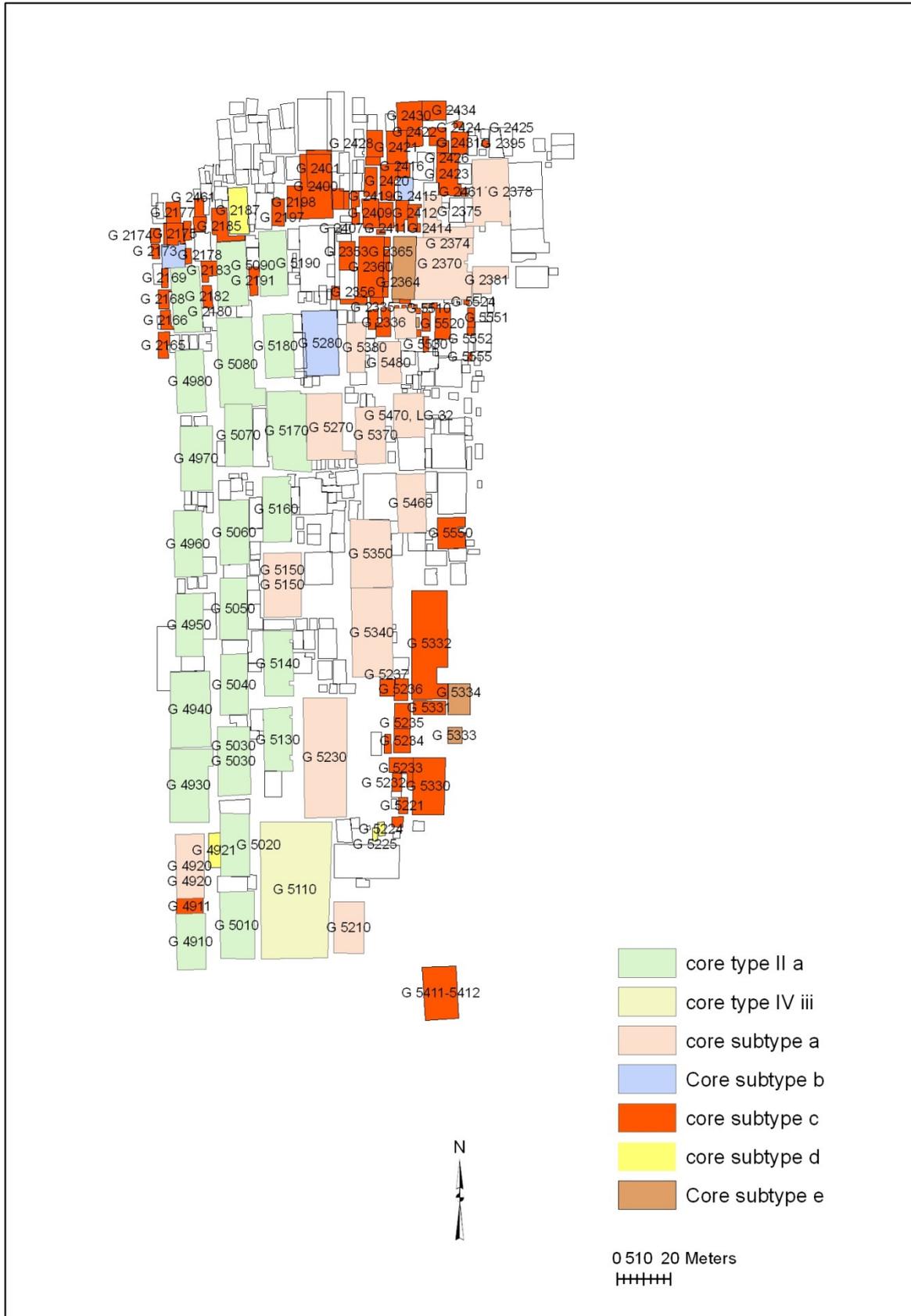
Map 5.11: Distribution of tombs of pyramid titles holders



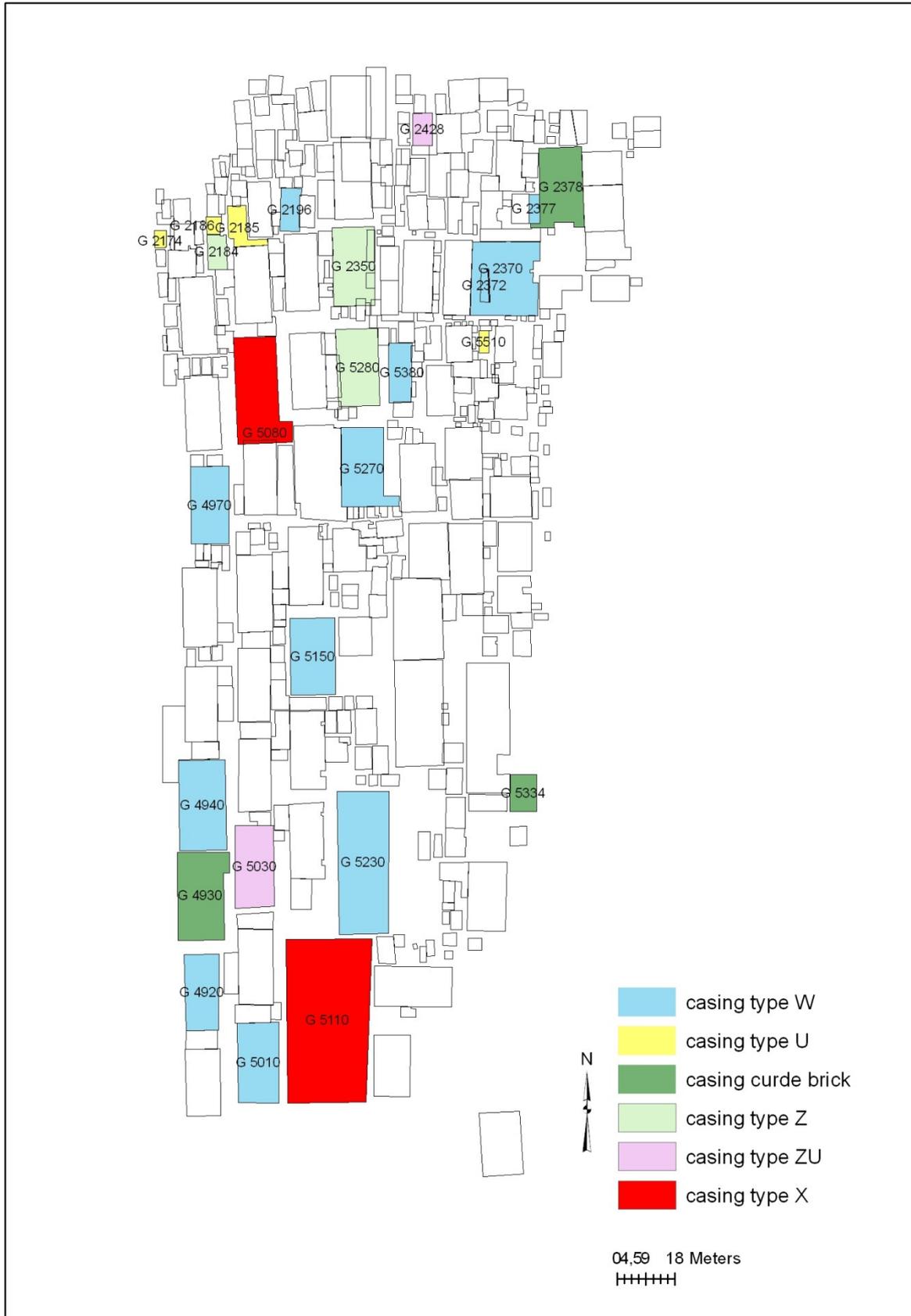
Map 5.12: Distribution of tombs of royal titles holders



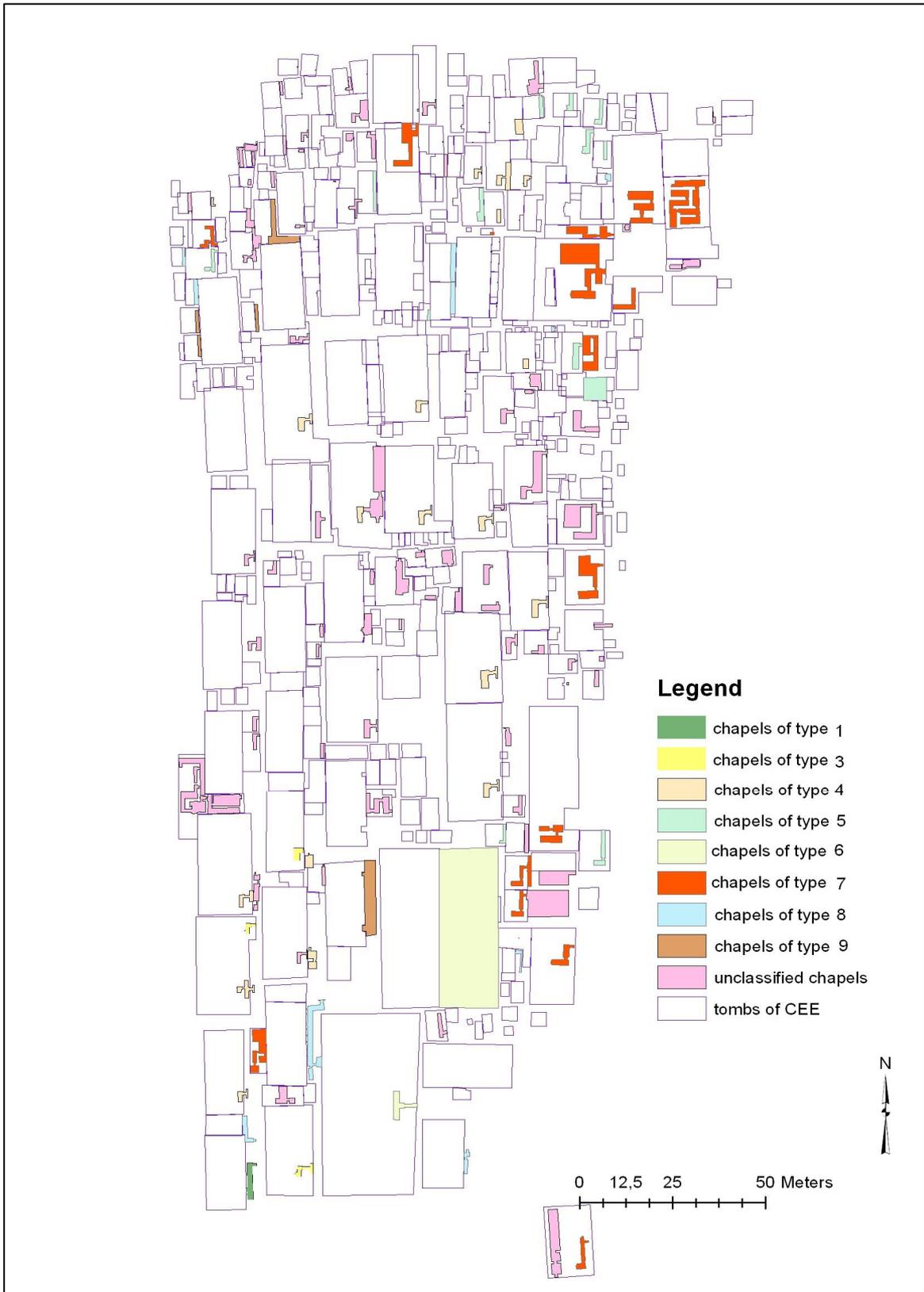
Map 5.13: Distribution of tombs of honorific titles holders



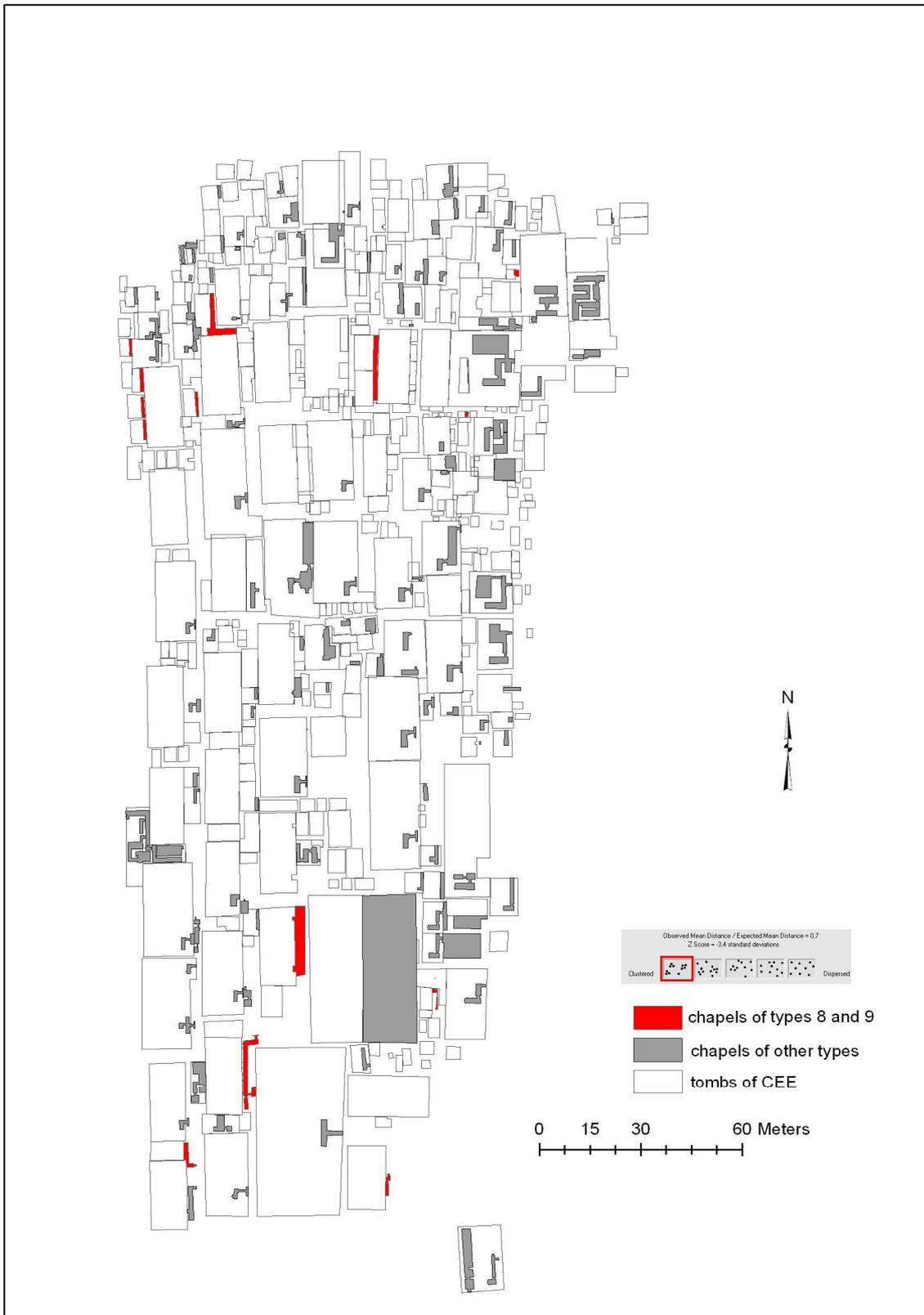
Map 6.1: core types in CEE



Map 6.2: casing types in CEE

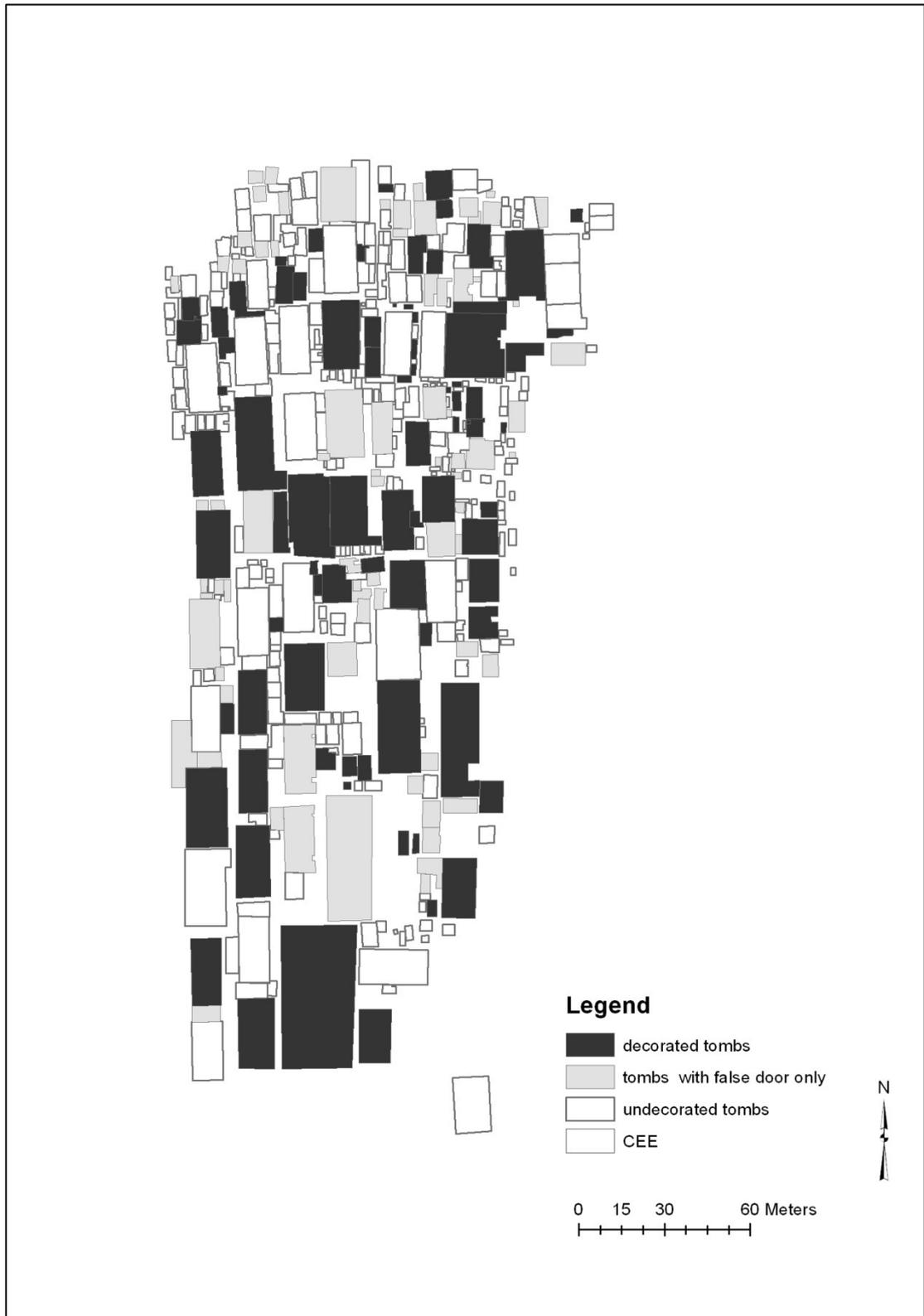


Map 6.3: Chapel types in CEE

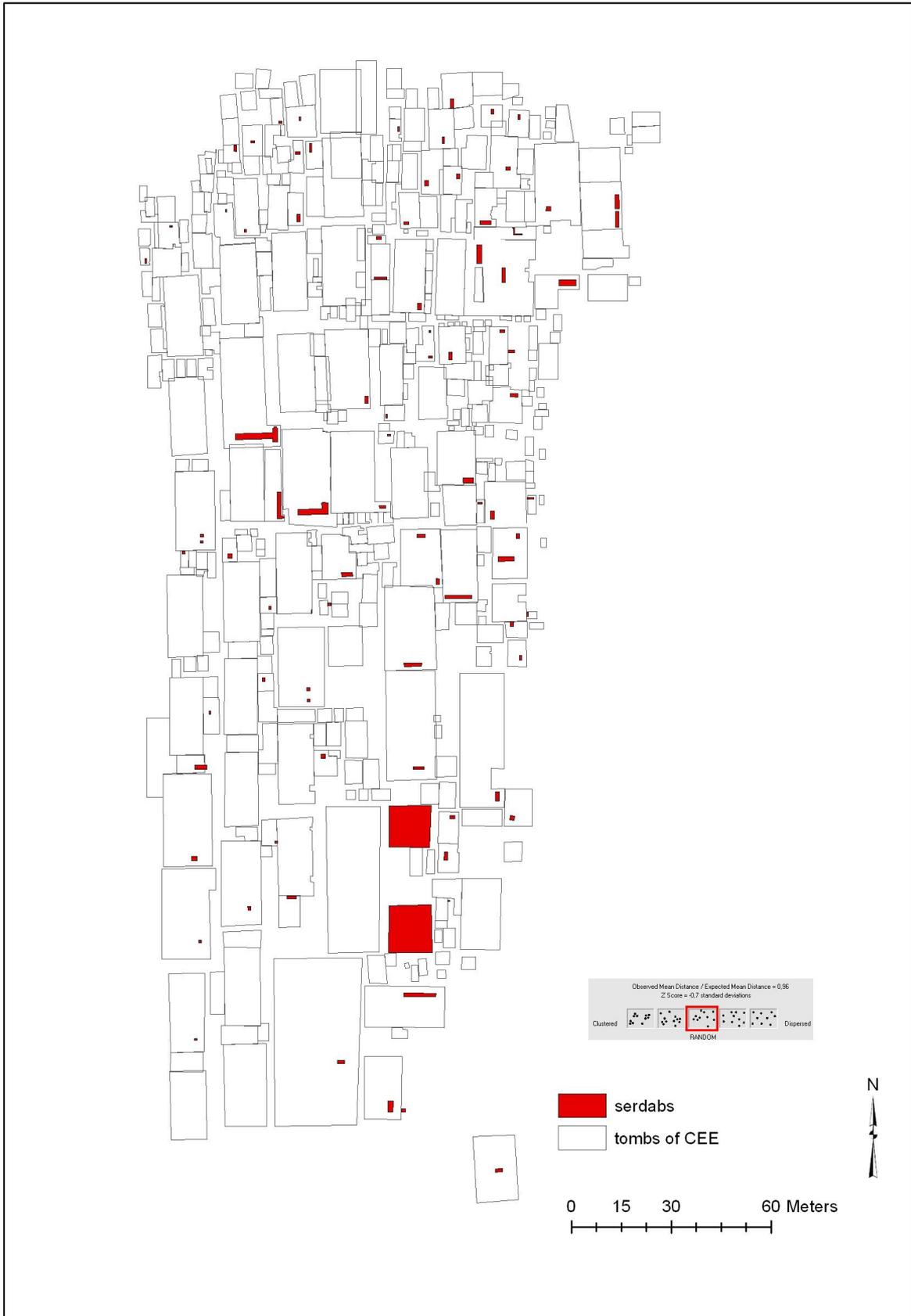


Map 6.4: Chapels of type 9 and 8¹ with nearest neighbour analysis

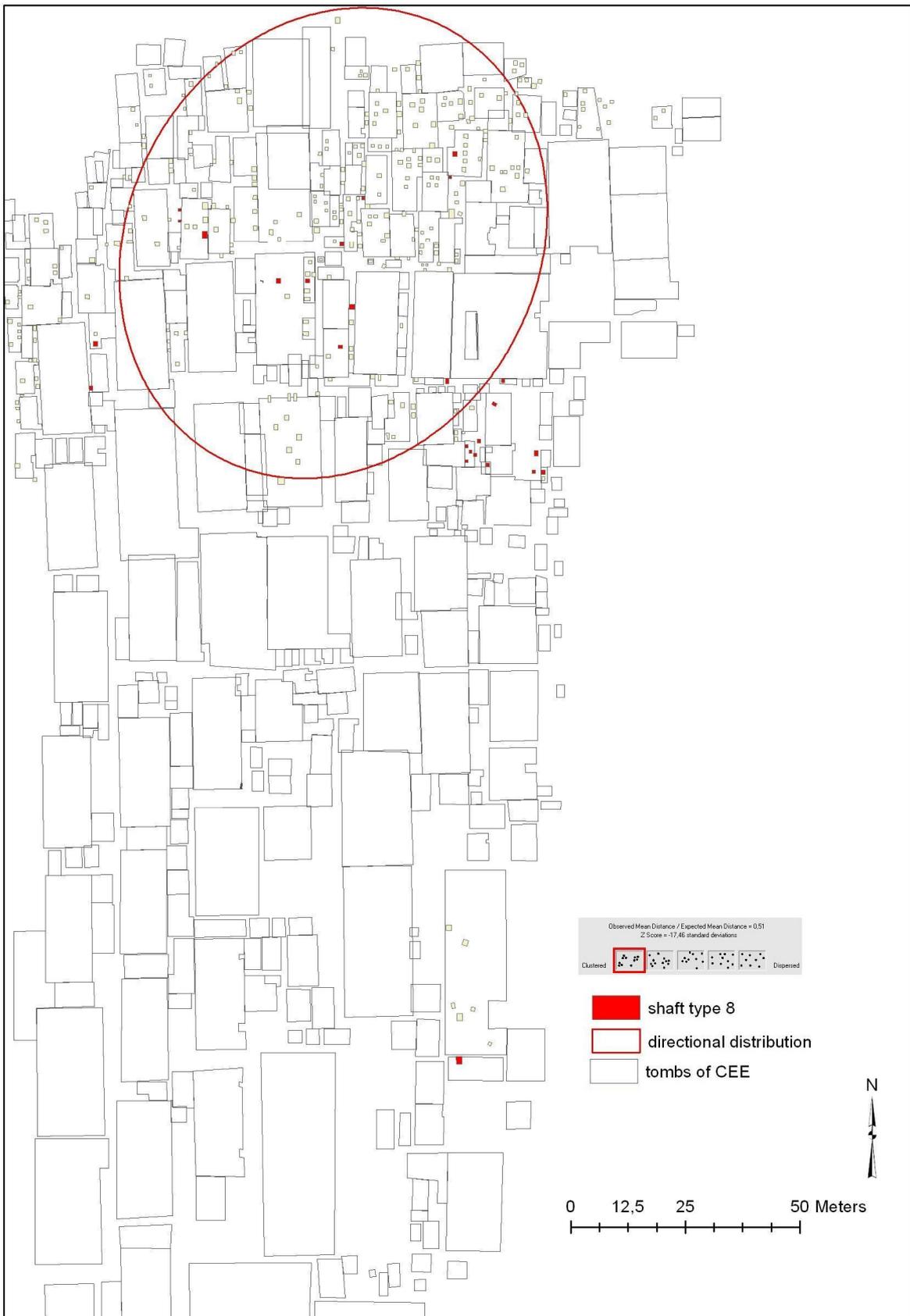
¹ Many chapels do not appear properly in the display because they were represented by tiny points on the map, see supra p. ?



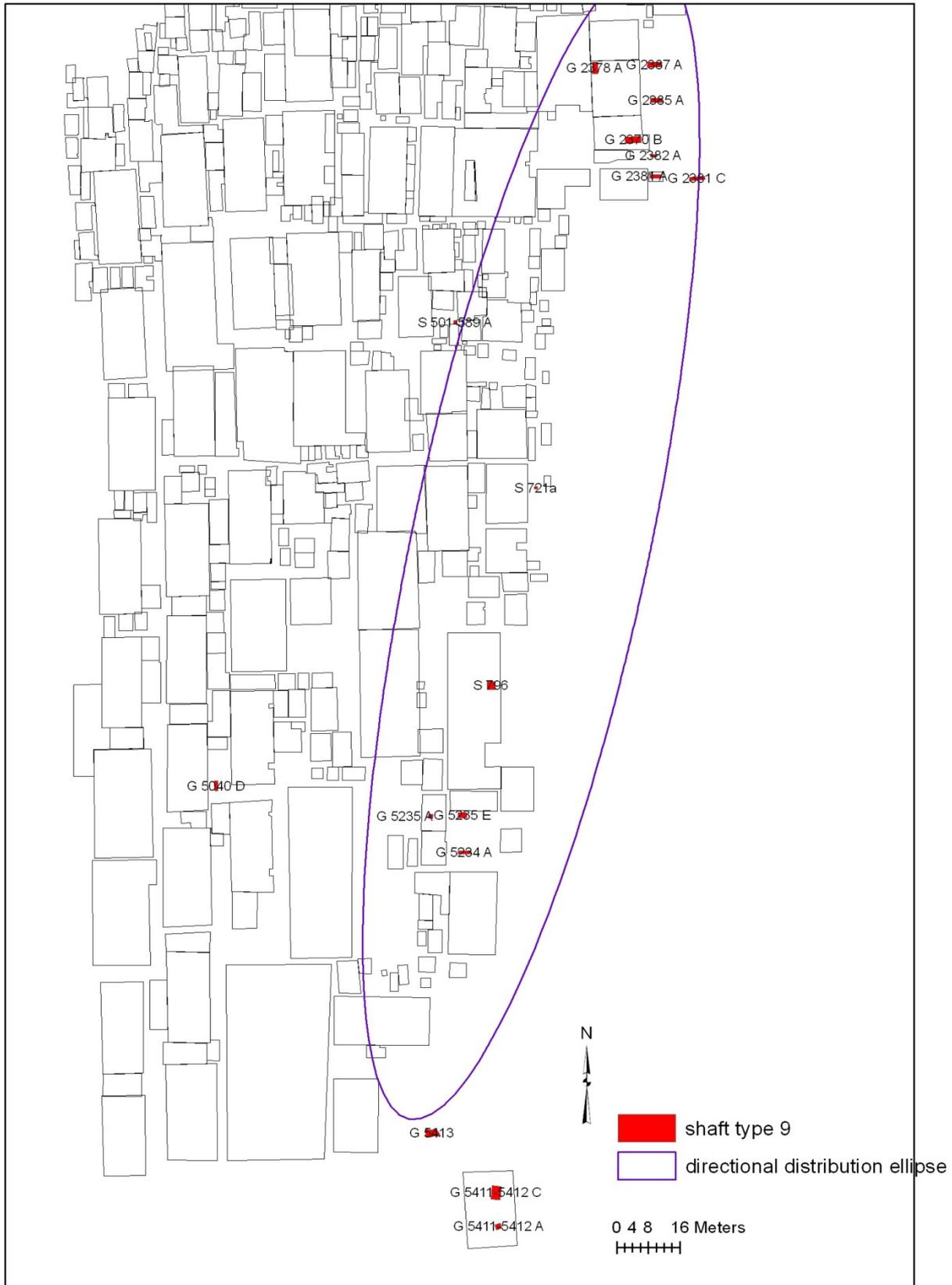
Map 6.5: status of decoration of CEE tombs



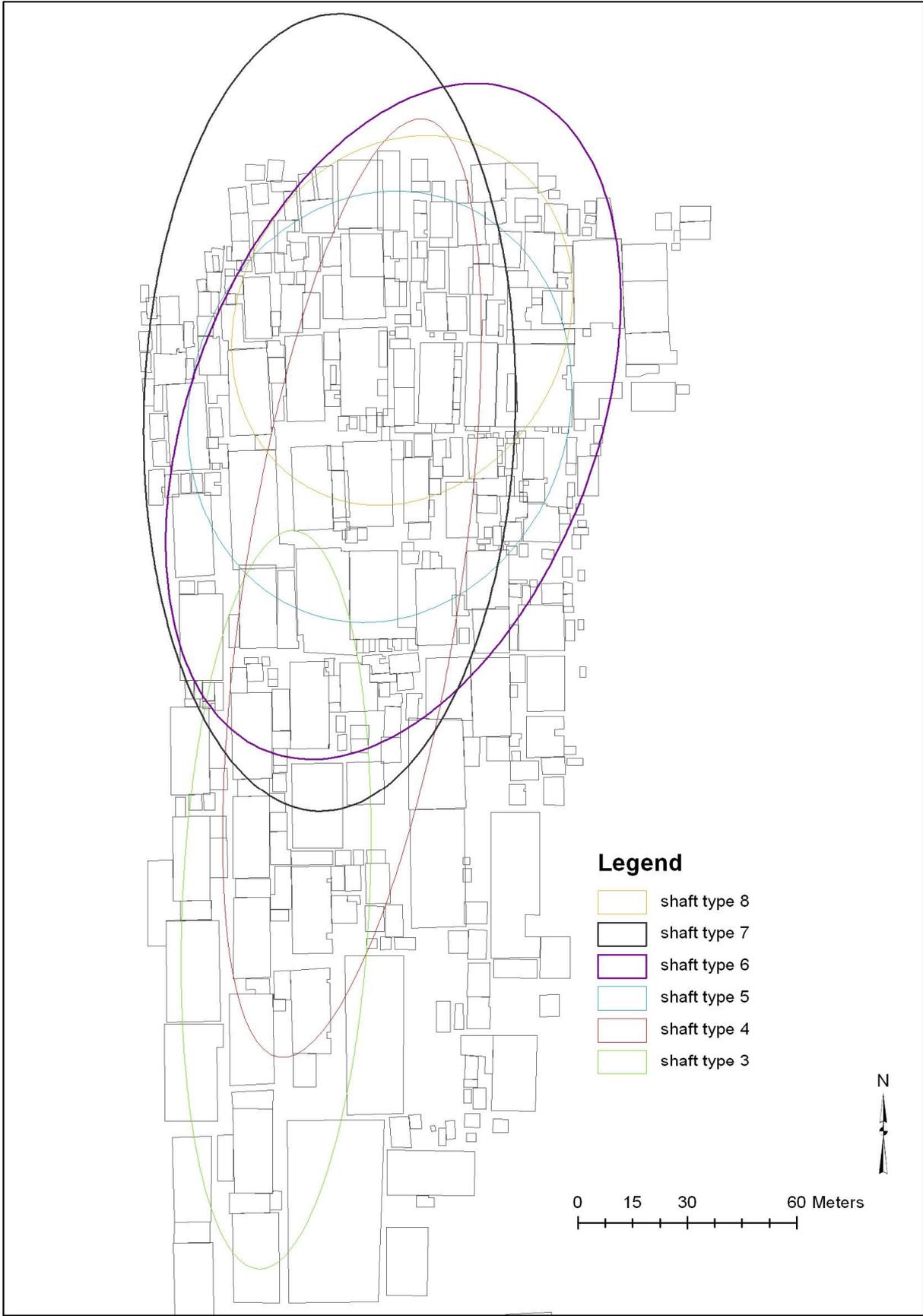
Map 6.6: distribution of serdabs in CEE



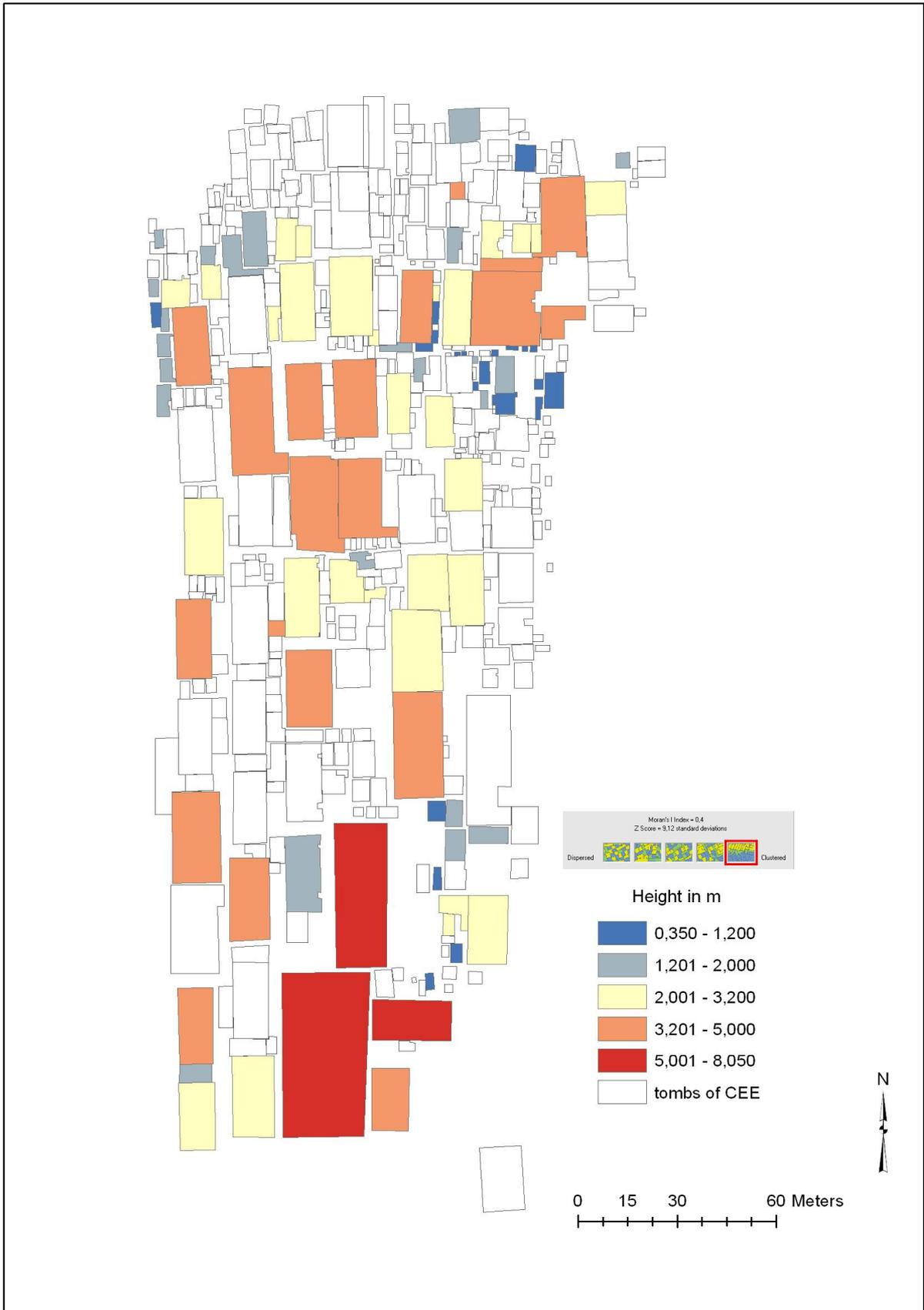
map 6.7: shafts of type 8 with nearest neighbour analysis and directional distribution ellipse



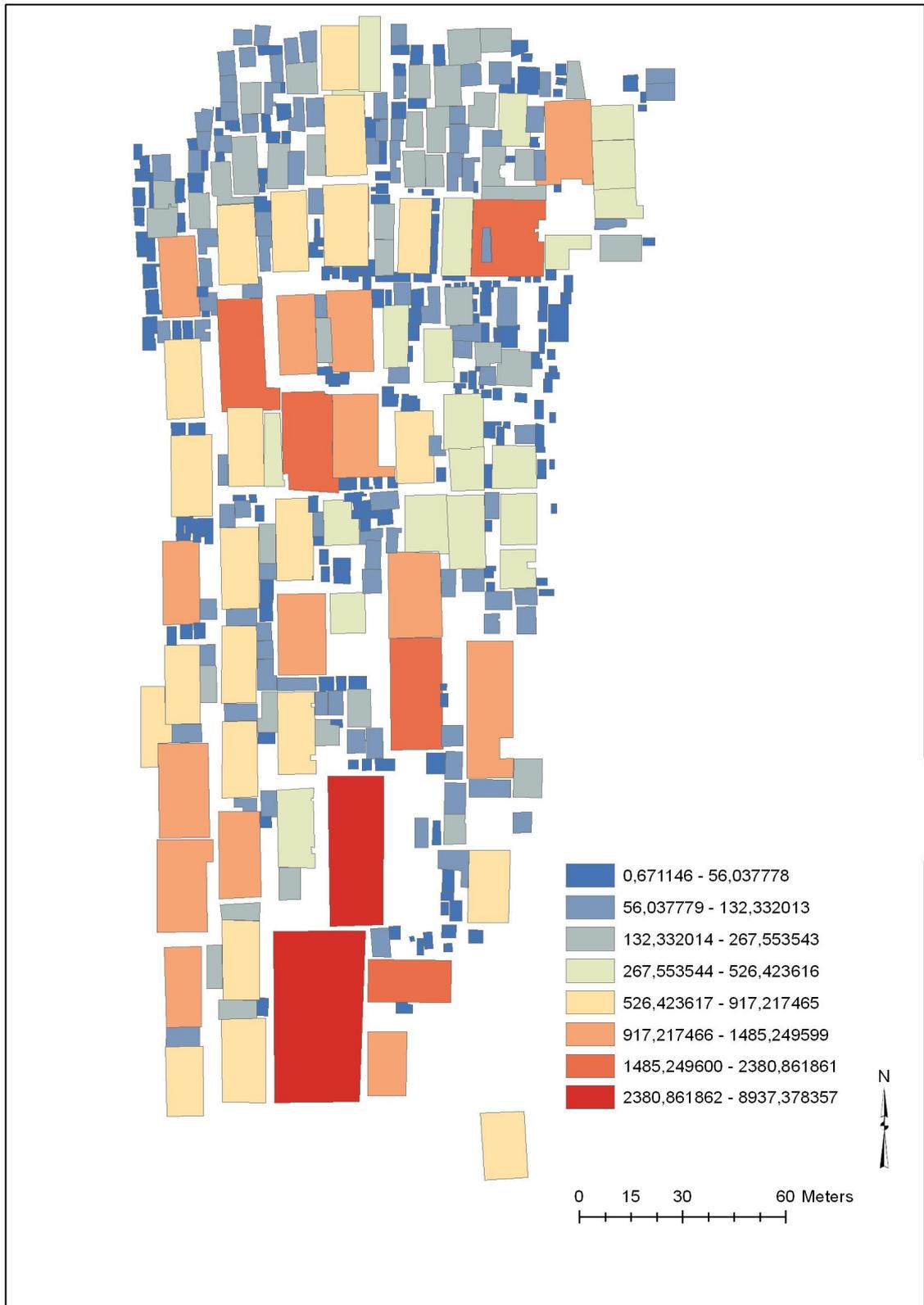
map 6.8: distribution of shaft type 9 in CEE



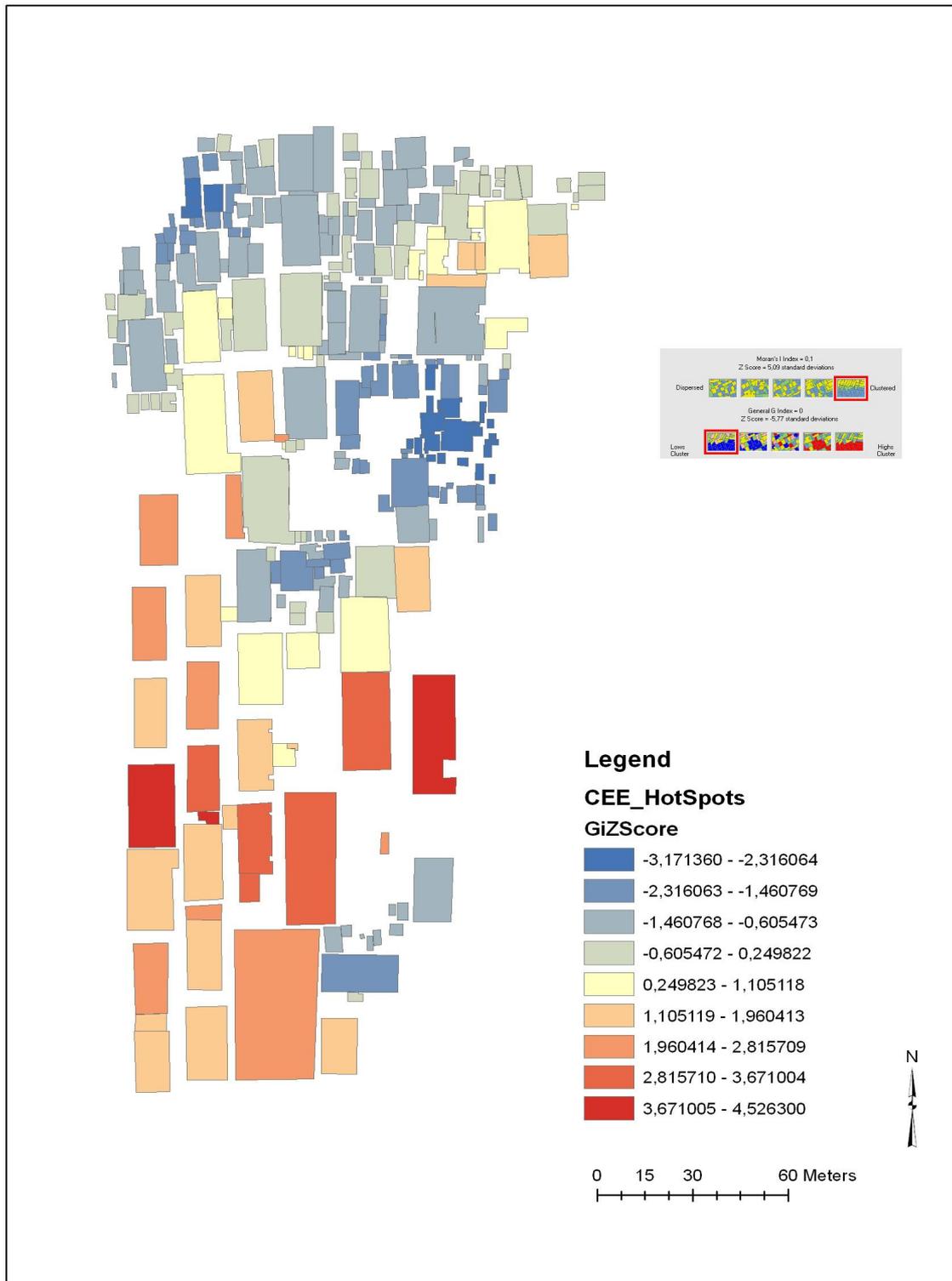
Map 6.9: directional distribution ellipses of shaft types 3 to 8 in CEE



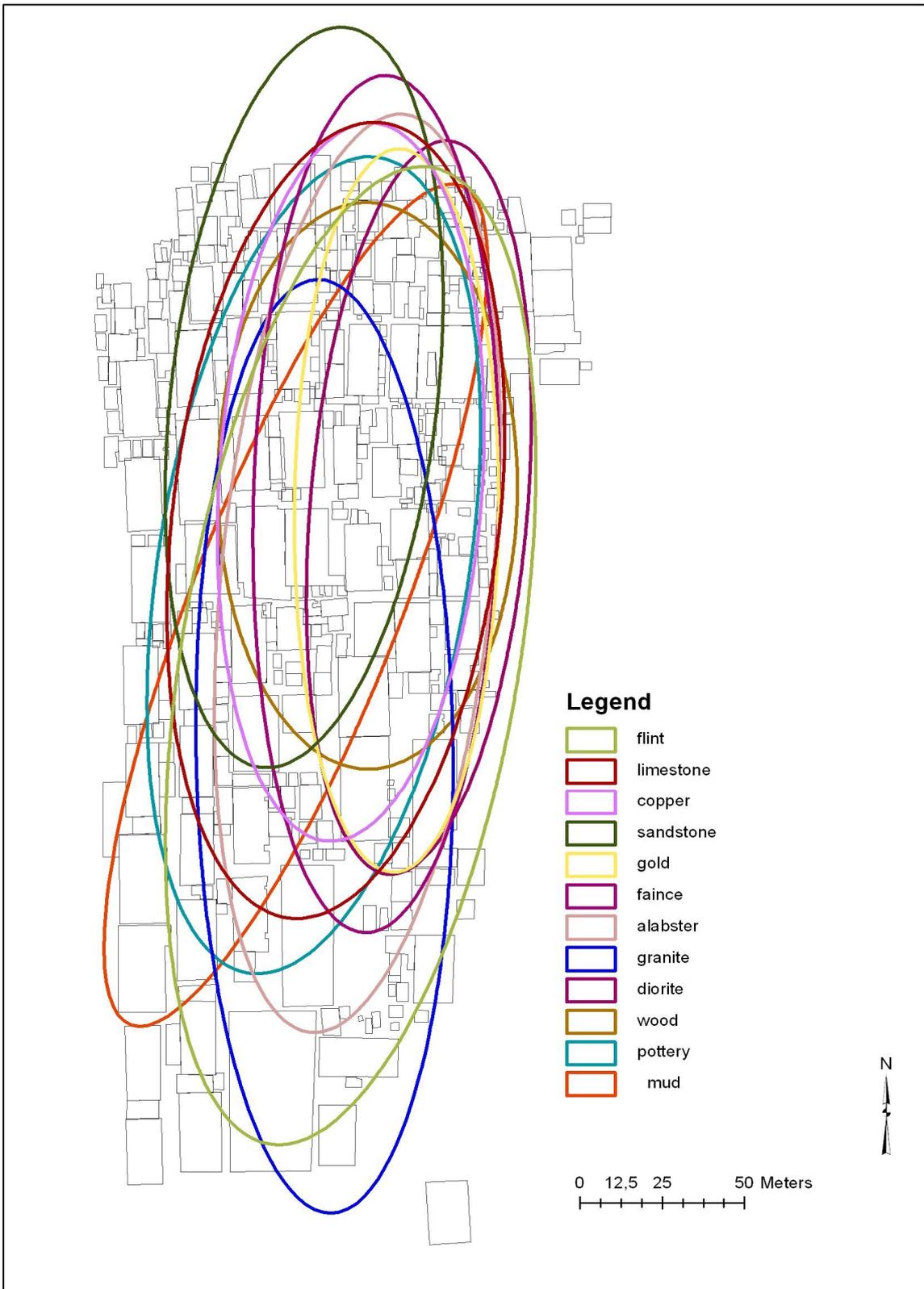
Map 6.10: mastabas with recorded height, with Moran's I index outcome



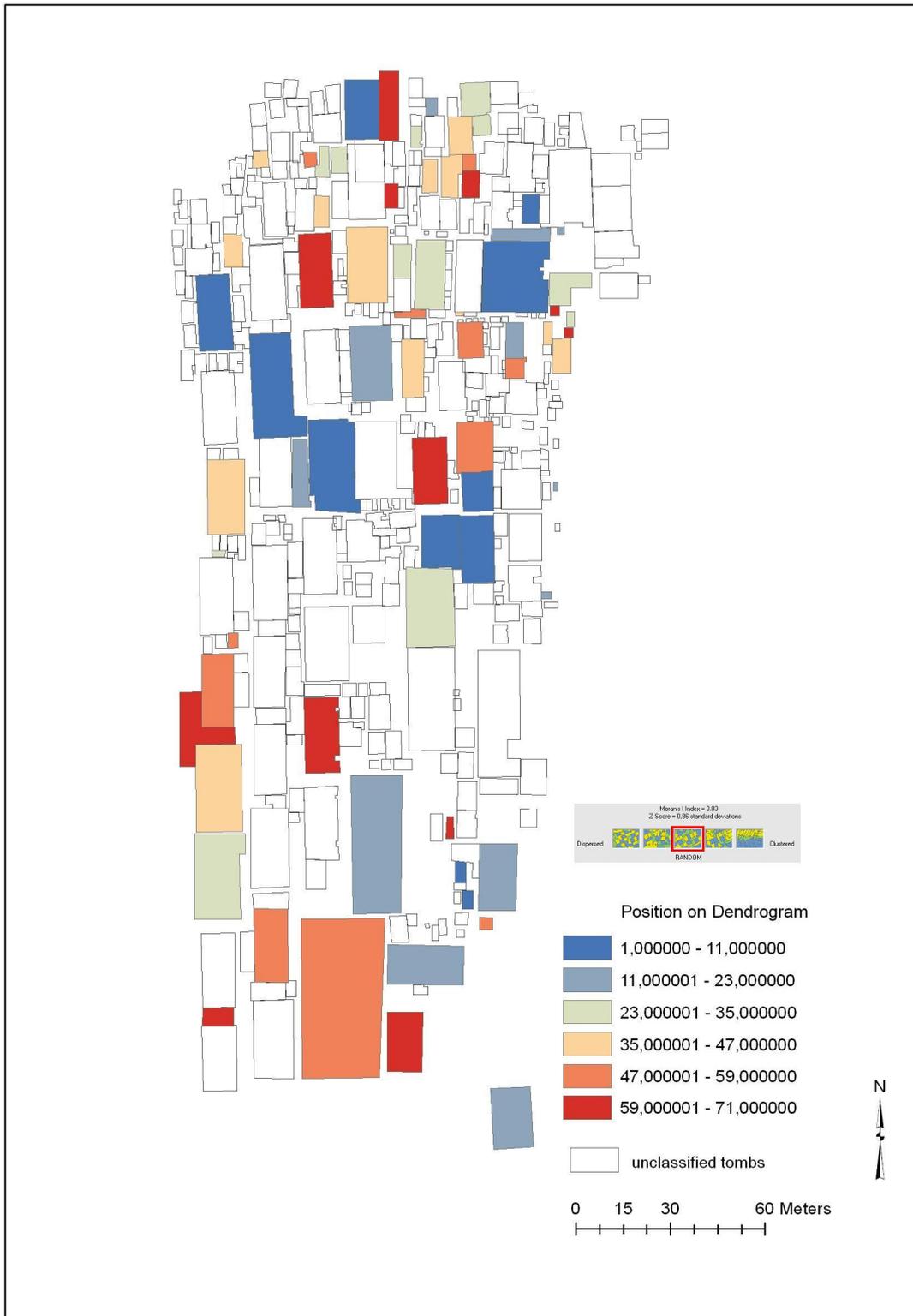
Map 6.11 : superstructure volume for cores of CEE



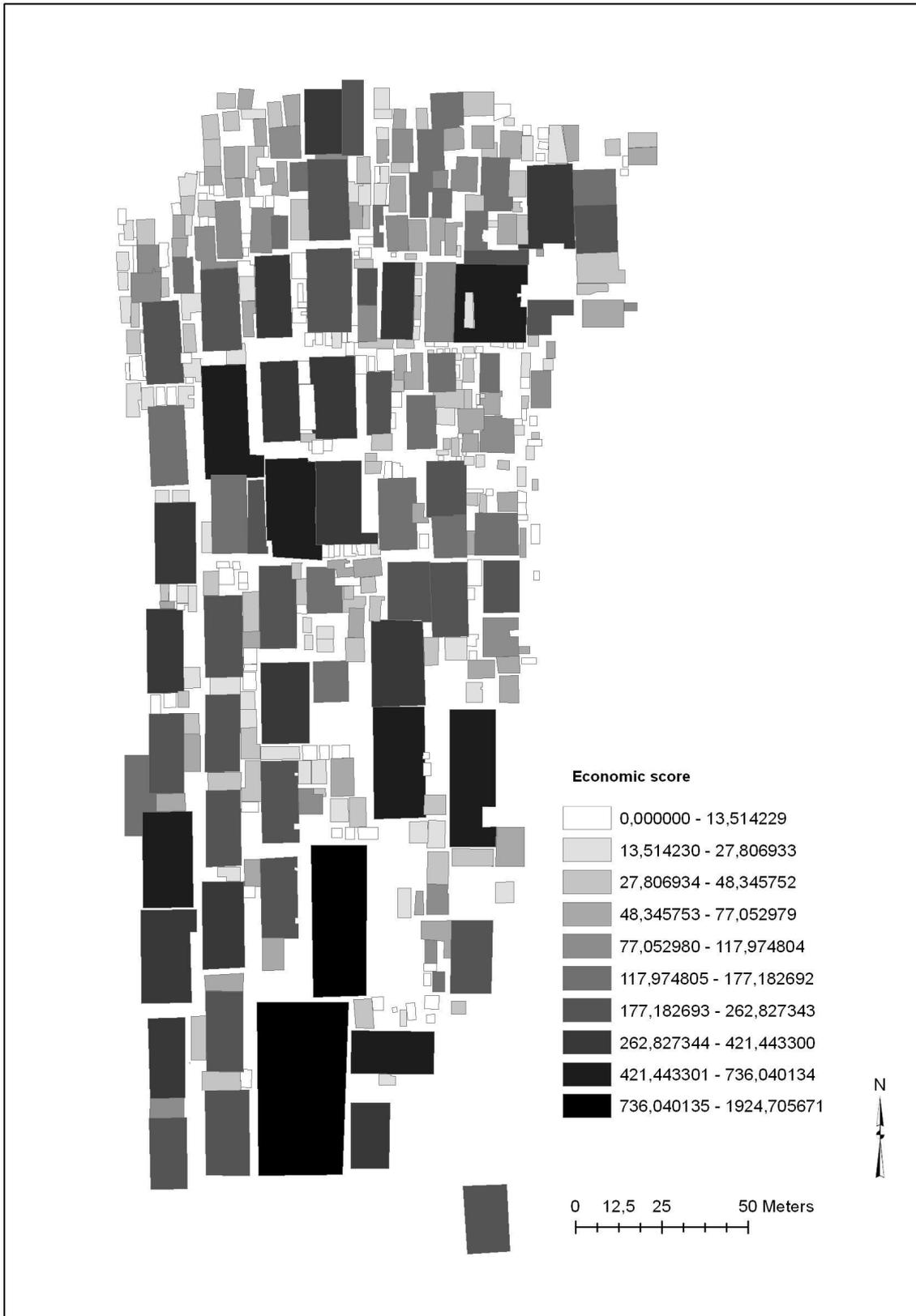
Map 6.12: substructure volume of CEE tombs with Moran's I, high-low clustering and hot spot analysis outcomes



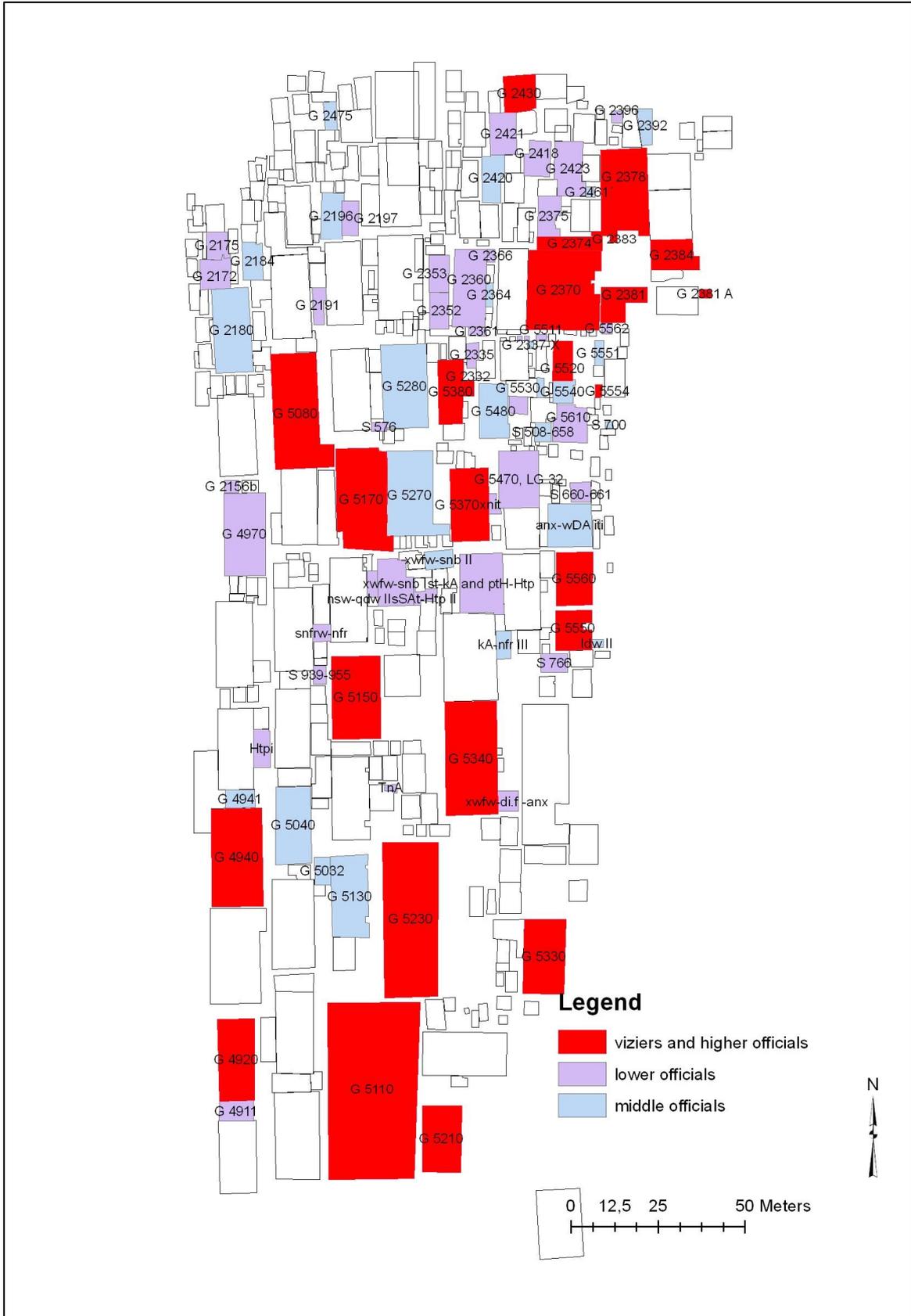
Map 6.13: Directional distribution ellipse for grave goods materials



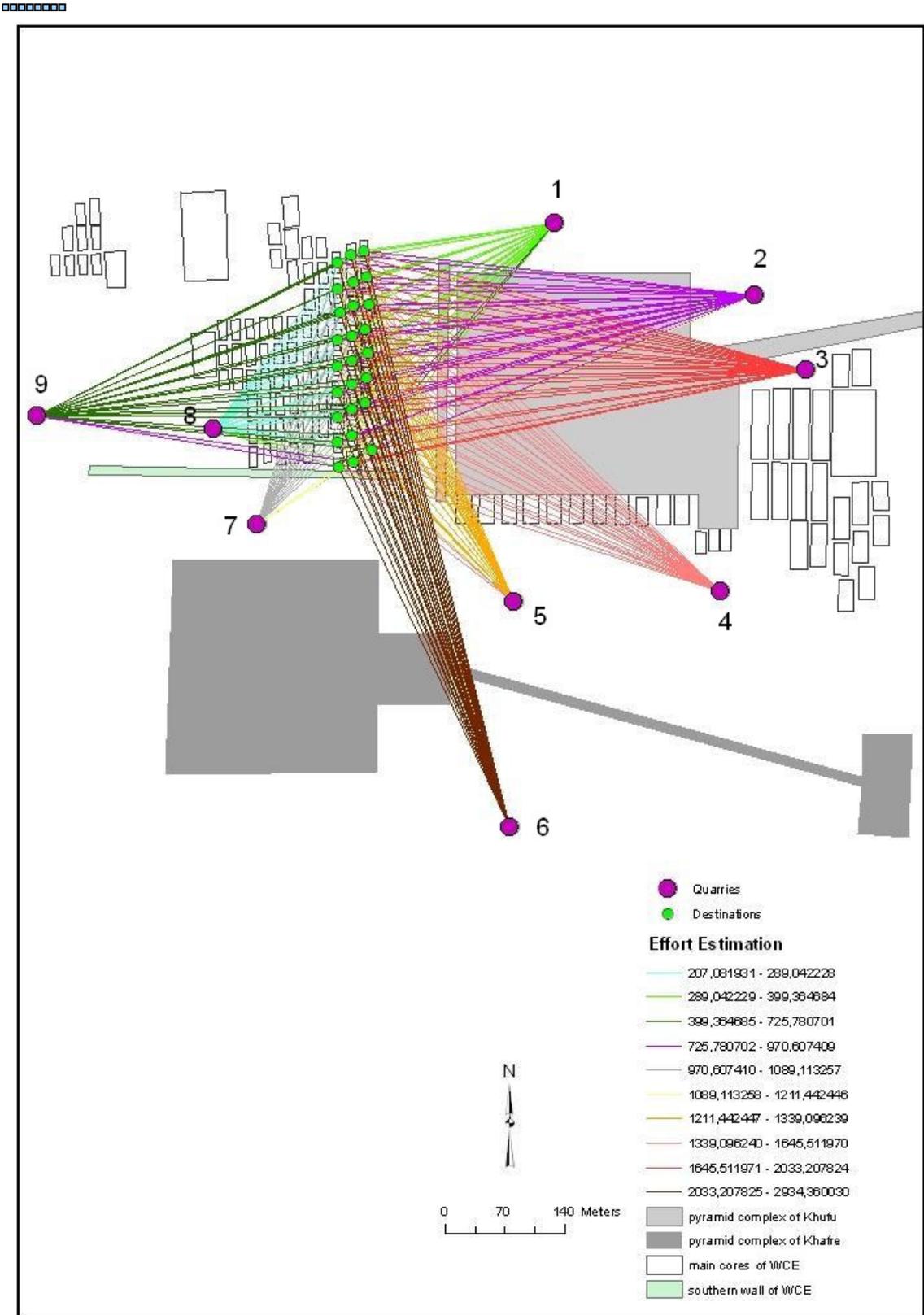
Map 6.14: tombs of CEE classified by Dendrogram 6.1 and the Moran's I index outcome



Map 6.16: Tombs of CEE represented according to their economic scores



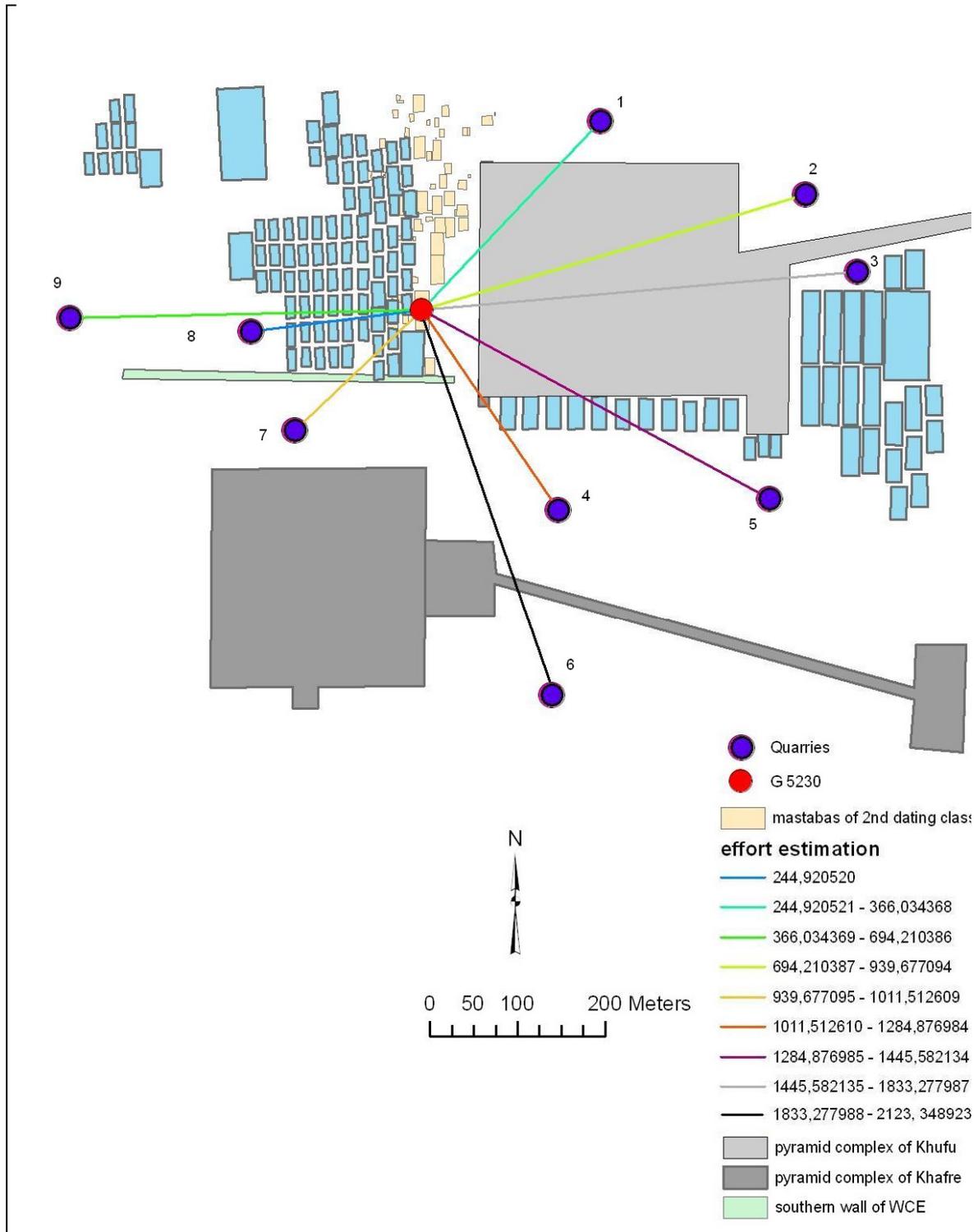
Map 6.17: Three categories of title bearers in CEE



Map

Map 7.1: Effort estimation for the transportation of stone from 9 quarries to the first 26 mastabas of CEE

In this and the following maps which are intended to show the Network analysis, the pyramid complexes of Khufu and Khafre were represented as large undetailed polygons, only to indicate that this area is inaccessible for the network solvers.



Map 7.2: Effort estimation for the transportation of stone from 9 quarries to G 5230



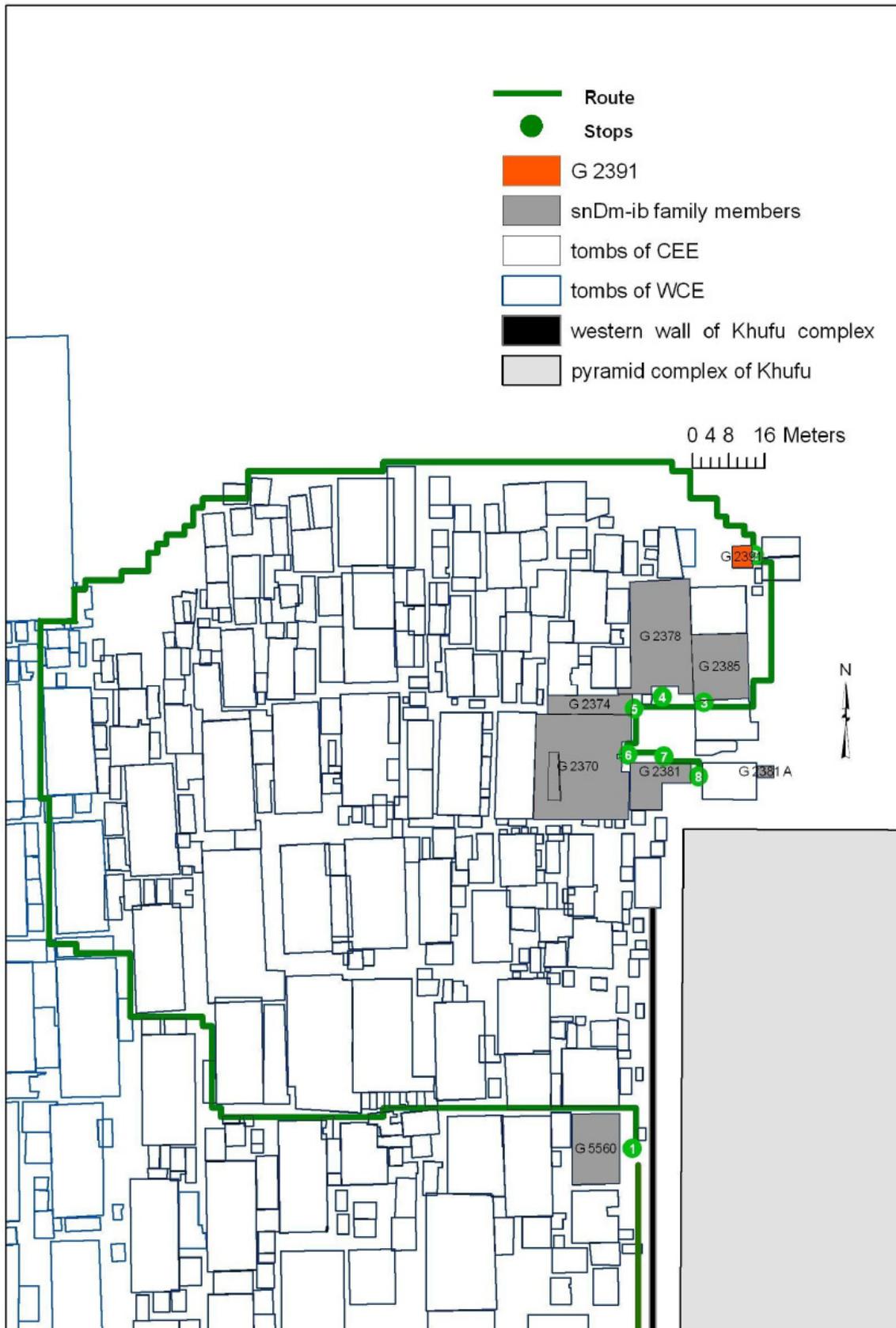
Map 7.3: Real route described by Reisner and the suggested route by network solver



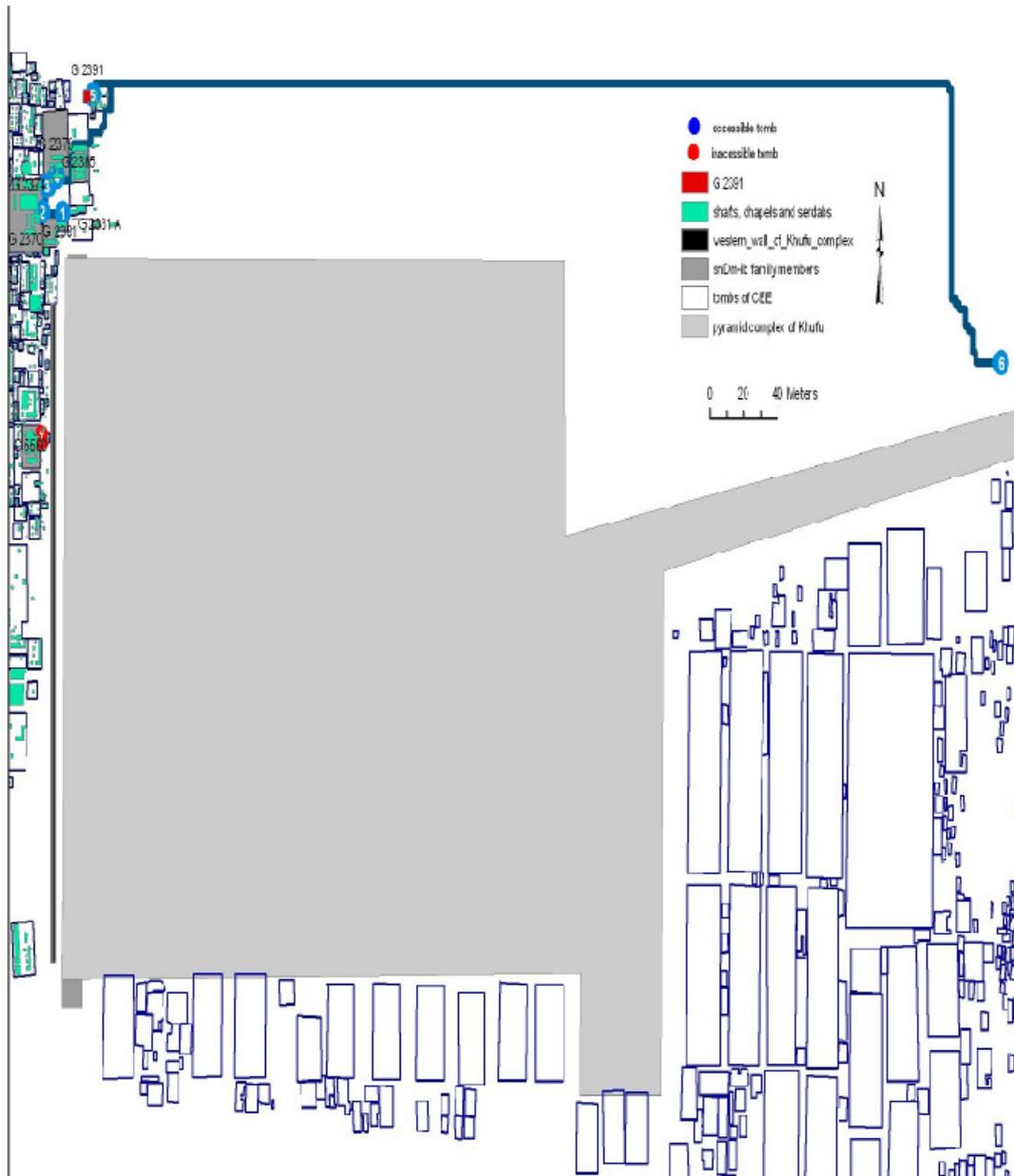
Map 7.4: Accessible and inaccessible points in CEE



Map 7.5: Suggested itinerary for *nfr-mḥi* with dating class 9



Map 7.6: Suggested itinerary for *nfr-mhi* with dating class 10



Map 7.7: Suggested itinerary for *nfr-mhi* with dating class 11

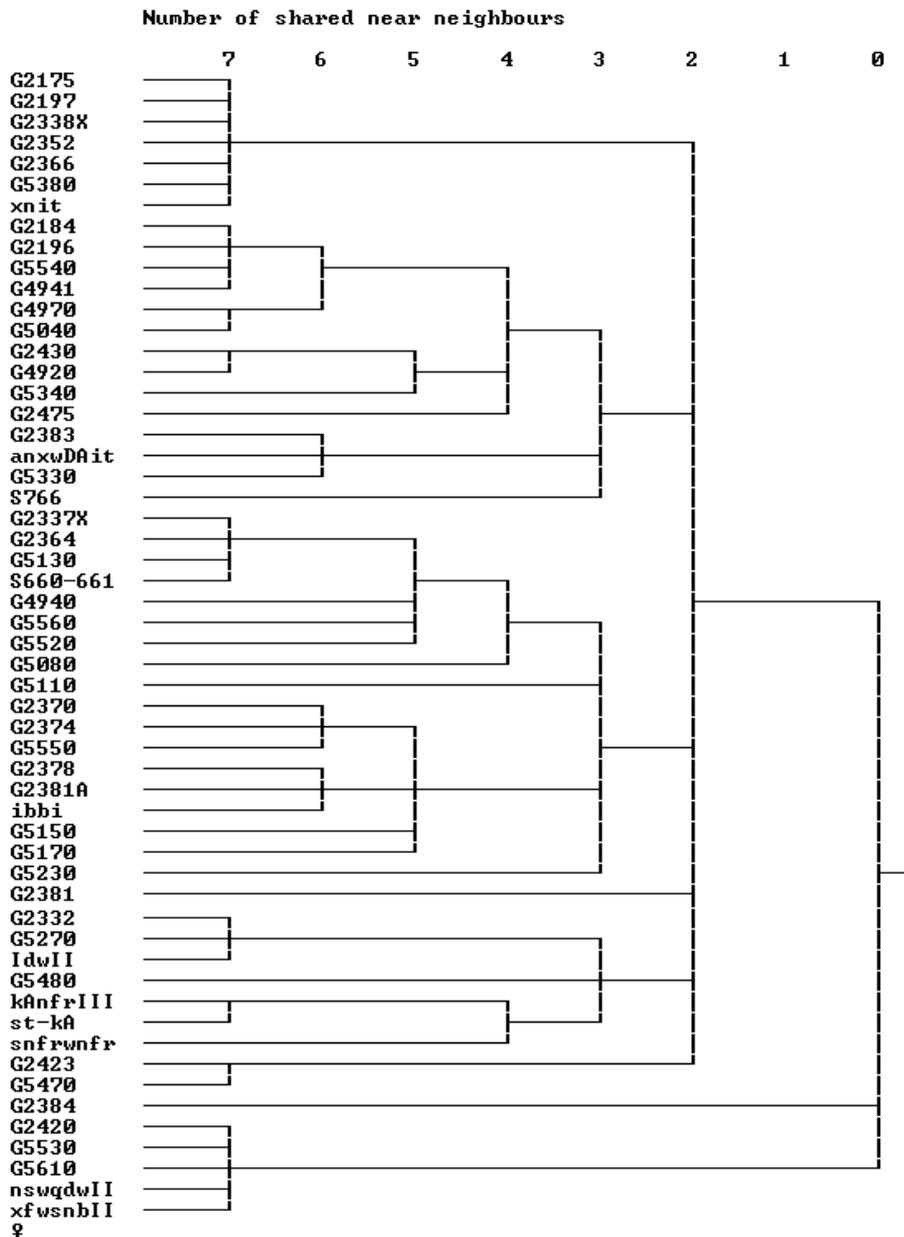


Map 7.8: Suggested itinerary for *nfr-htp* with dating classes 5-10

Dendrograms

Near Neighbour Clustering of titles

Similarity Coefficient: Jaccard
 Number of Neighbours considered: 7

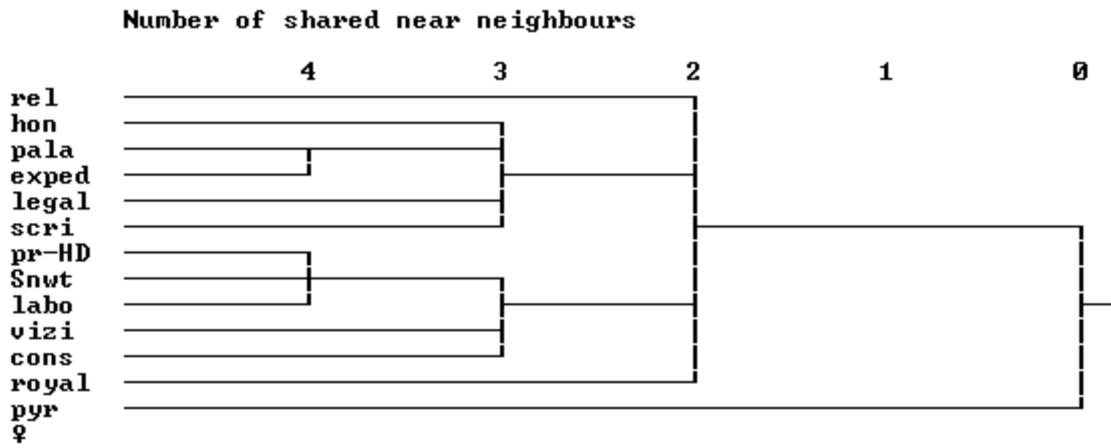


Level	#Clusters	mean # el.	#el. in Residue
2	2	27.0	1
3	5	10.2	4
4	8	5.9	8
5	8	5.3	13
6	8	4.3	21
7	5	4.6	32

Dendrogram 5.1: Clustering of tombs according to titles

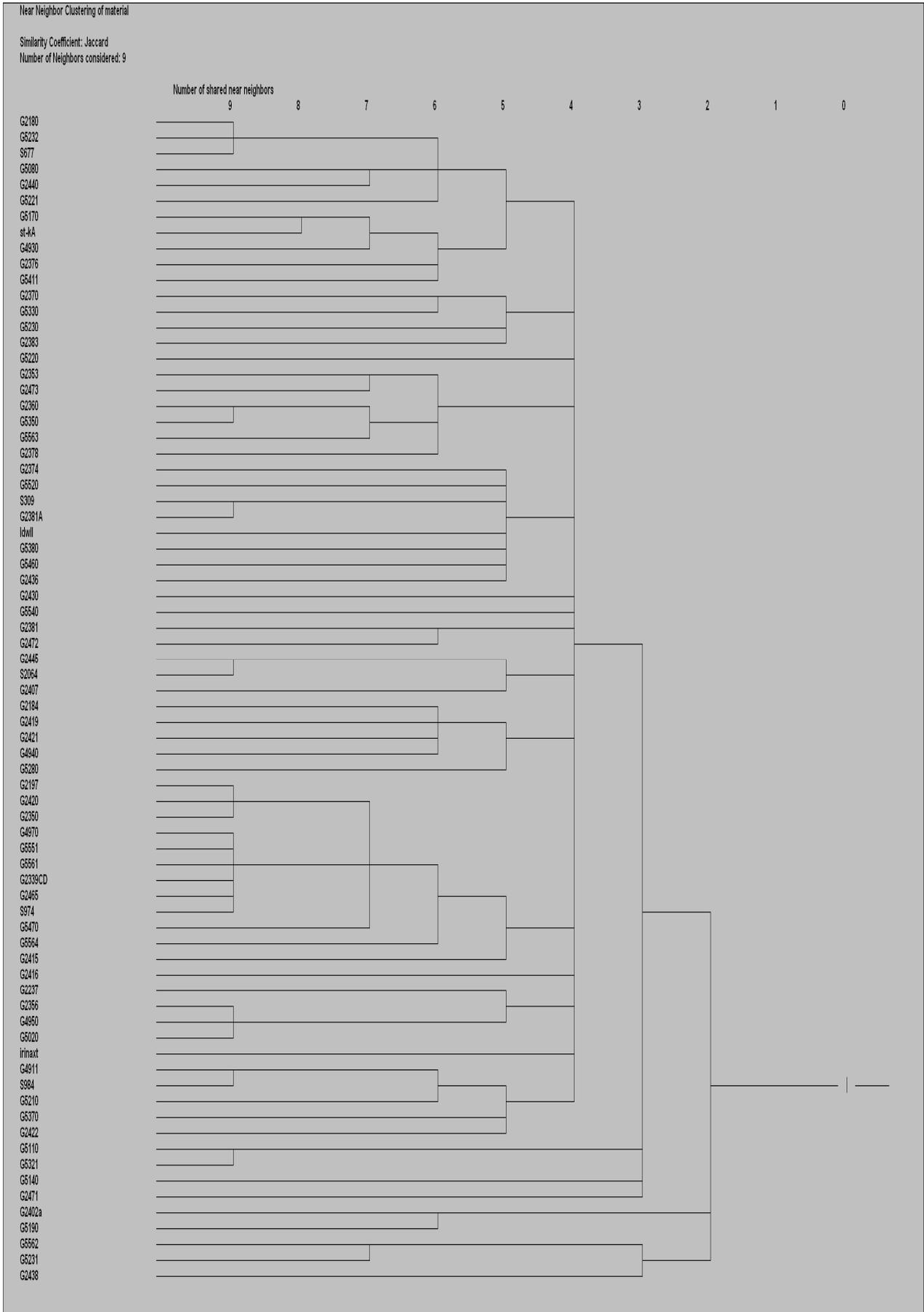
Near Neighbour Clustering of titles

Similarity Coefficient: Jaccard
 Number of Neighbours considered: 4



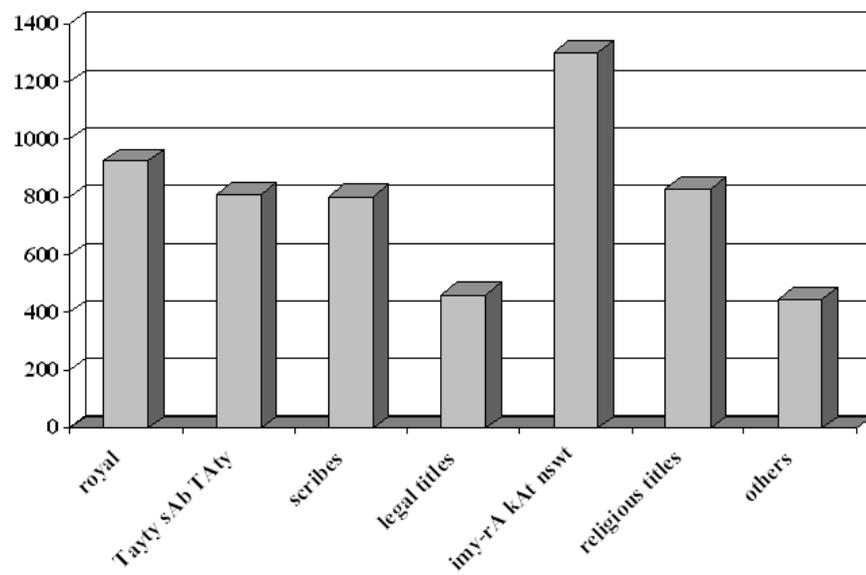
Level	#Clusters	mean # el.	#el. in Residue
2	1	12.0	1
3	2	5.0	3
4	1	3.0	10

Dendrogram 5.2: Clustering of titles co-occurring in same tombs

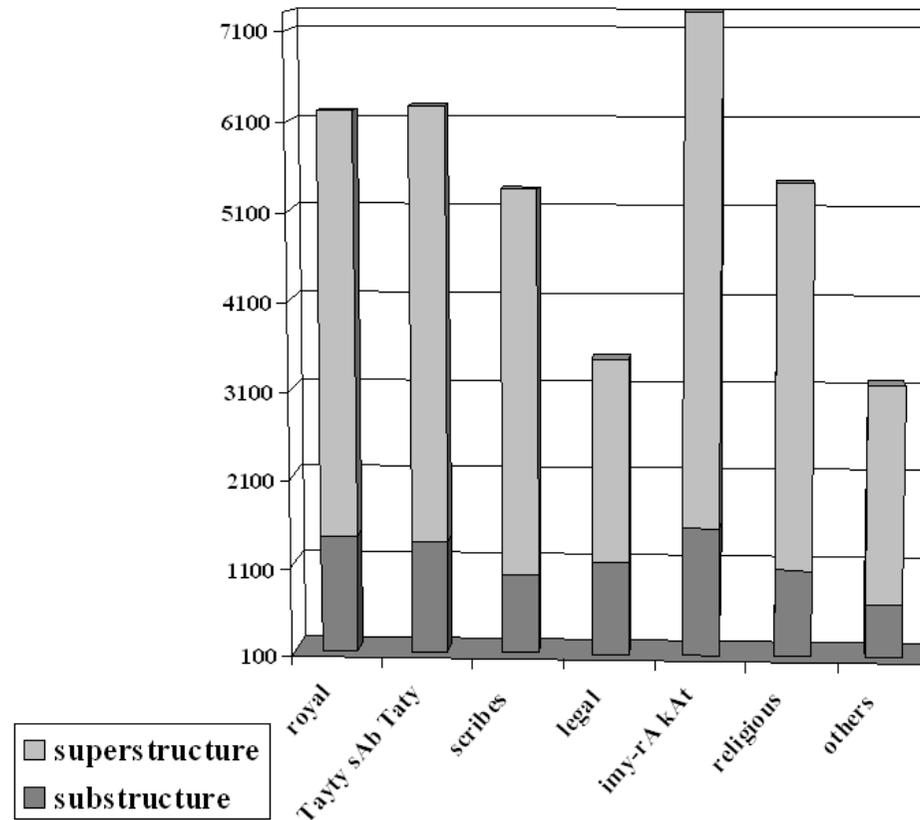


Dendrogram 6.1: The clustering of tombs of CEE according to the materials of grave goods attested in their shafts.

Graphs

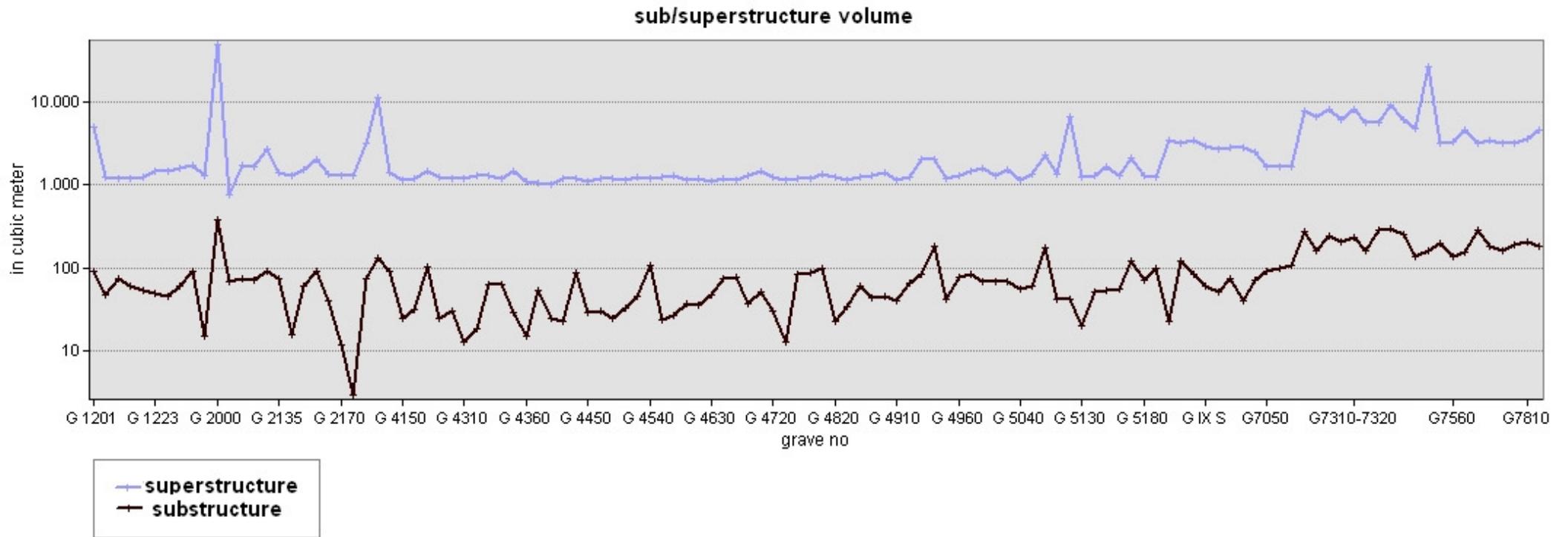


Graph 1.1: means of tomb area of seven title categories

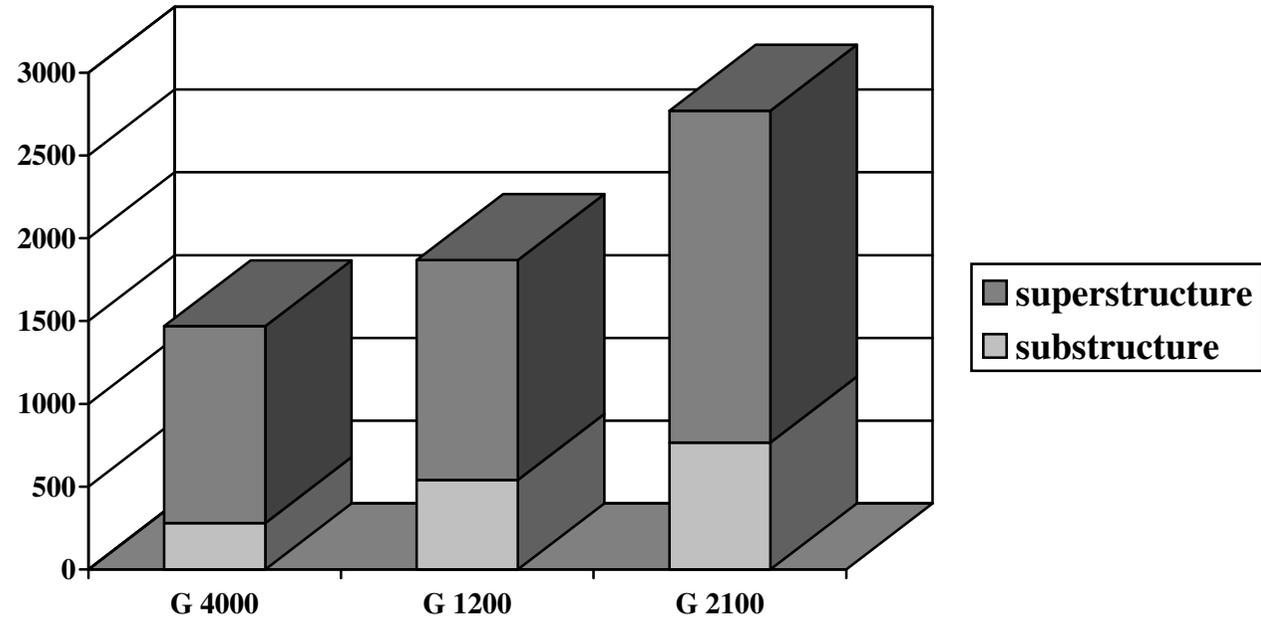


Graph 1.2: means of volume of superstructure and substructure for seven title categories¹

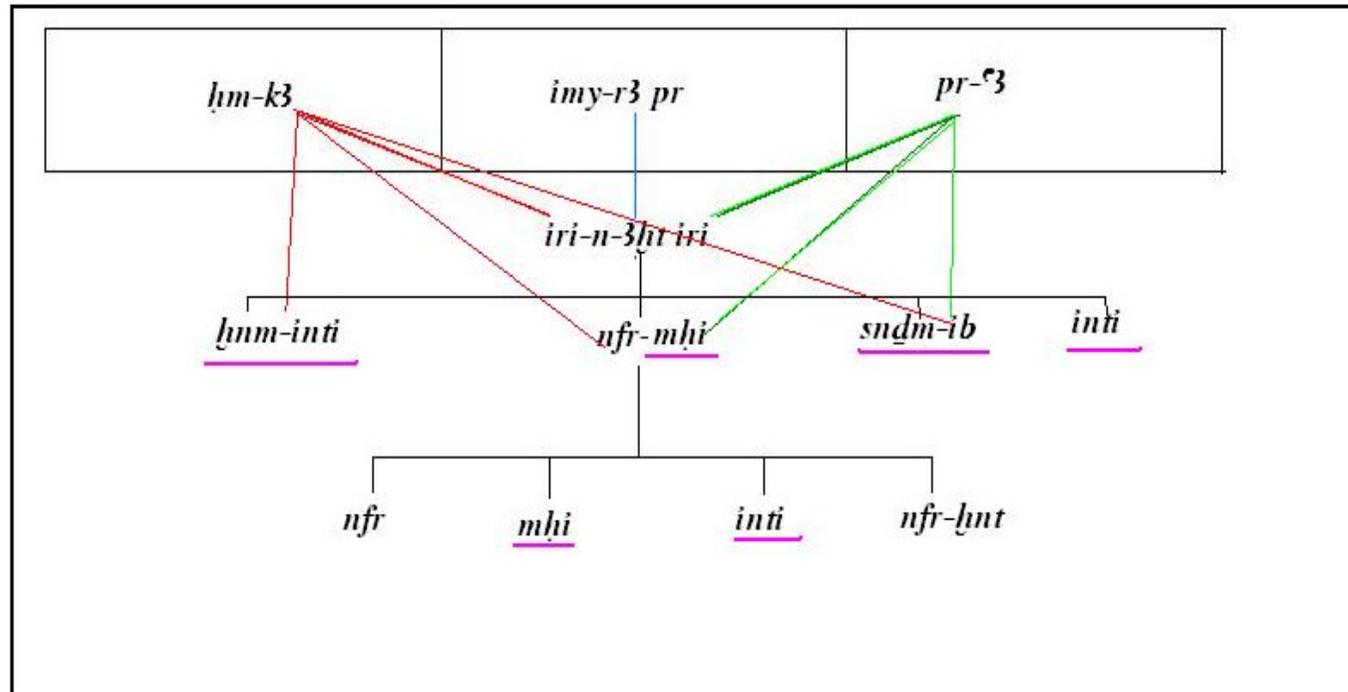
¹ For purpose of presentation the volume of substructure was multiplied by 10 for each group.



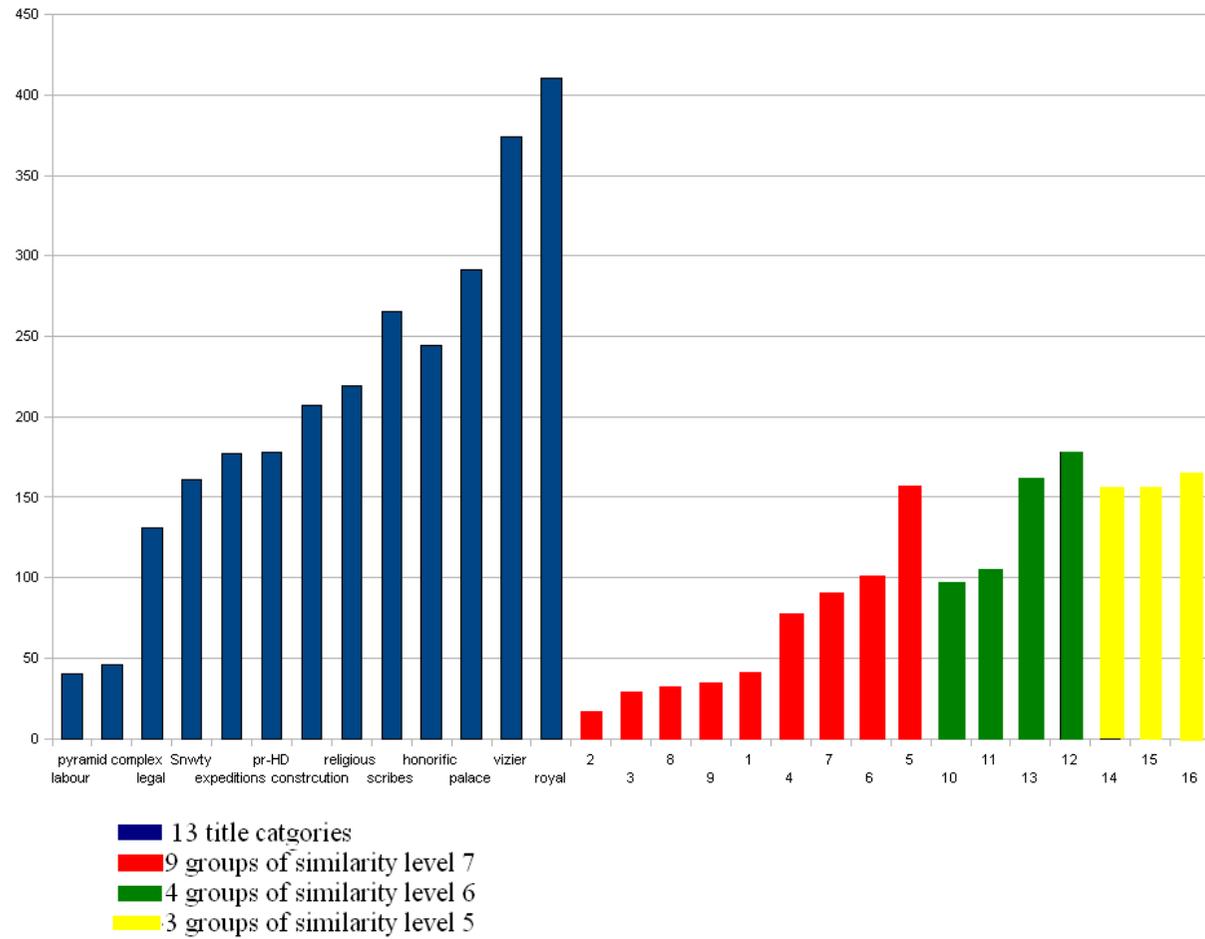
Graph 1.3: Volumes of substructure and superstructure of main cores



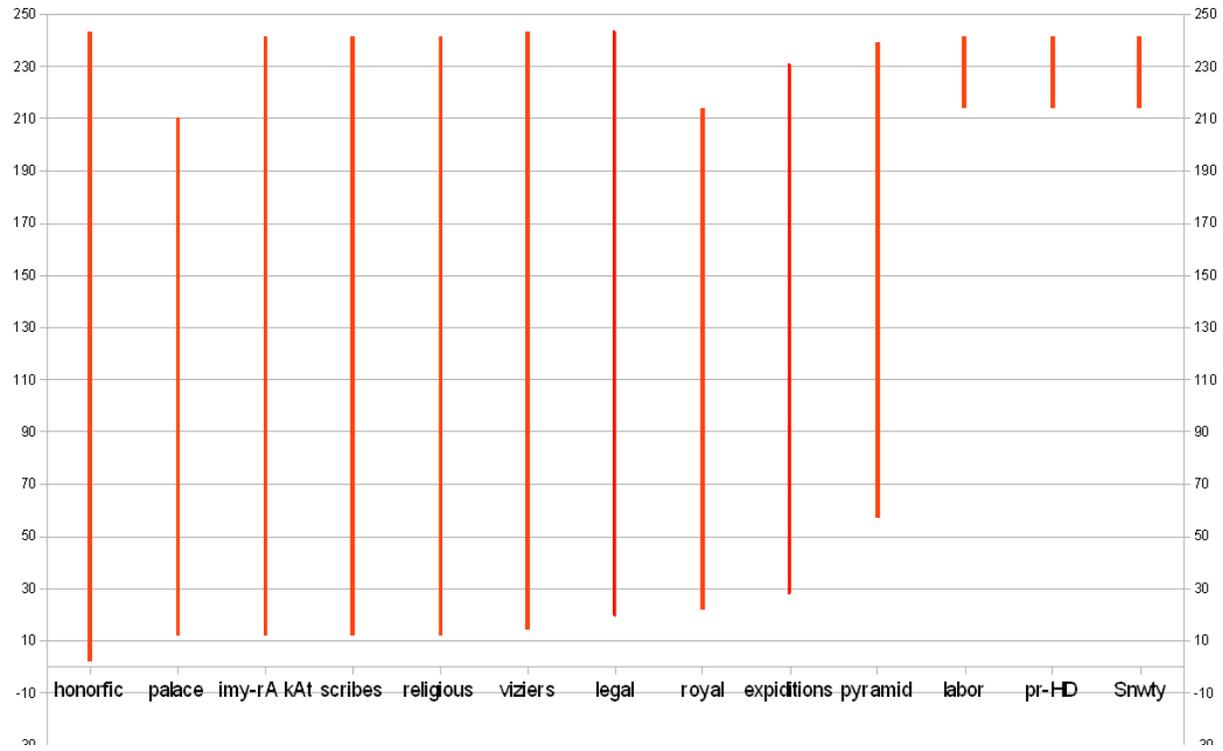
Graph 1.4: means of volume of superstructure and substructure for the earlier cores in 3 nucleus cemeteries



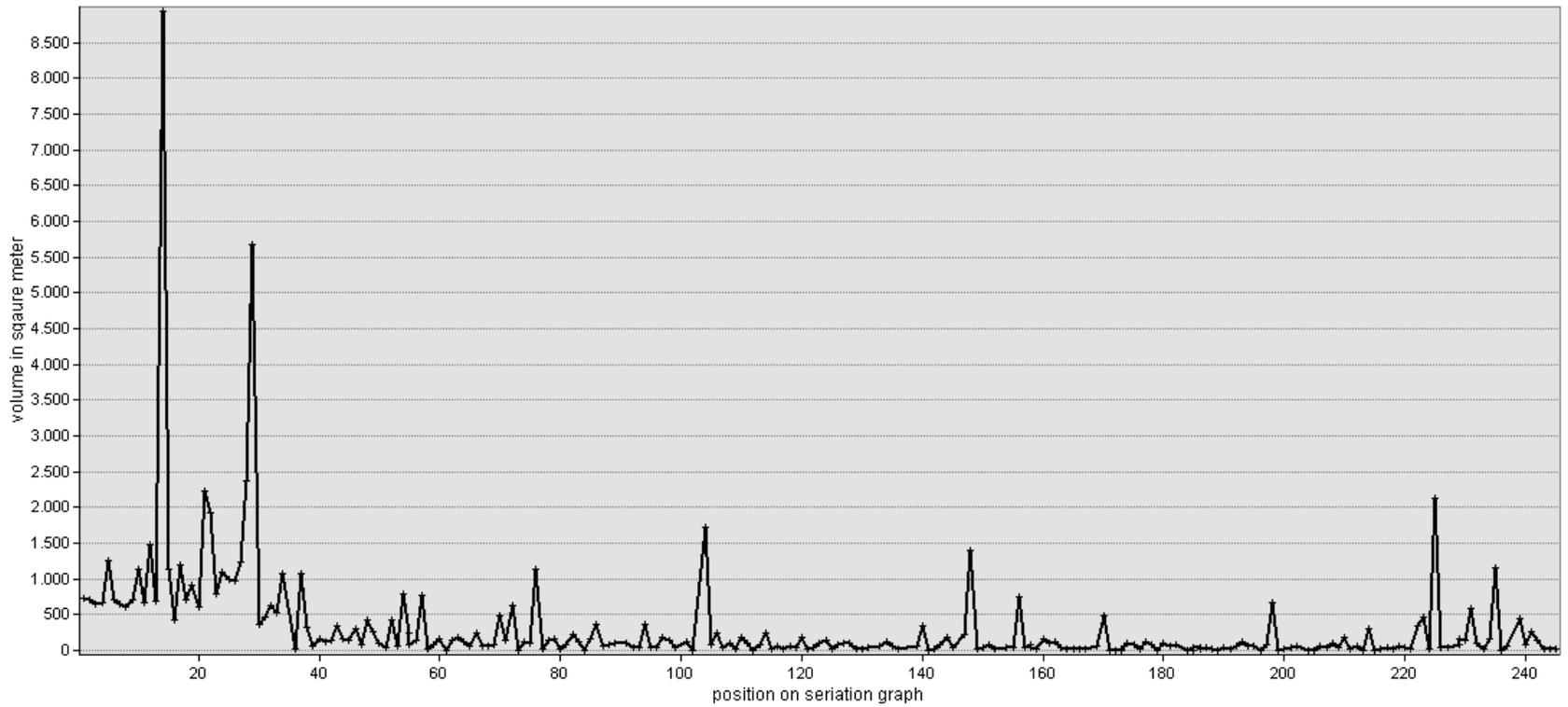
Graph 4.1: genealogy and careers of males in the *inri-n-3ht iri* family (G2391)
 namesakes of *sdm-ib* family underlined



Graph 5.1: Values of standard deviation of tomb areas



Graph 5. 2: A time line of 13 title categories

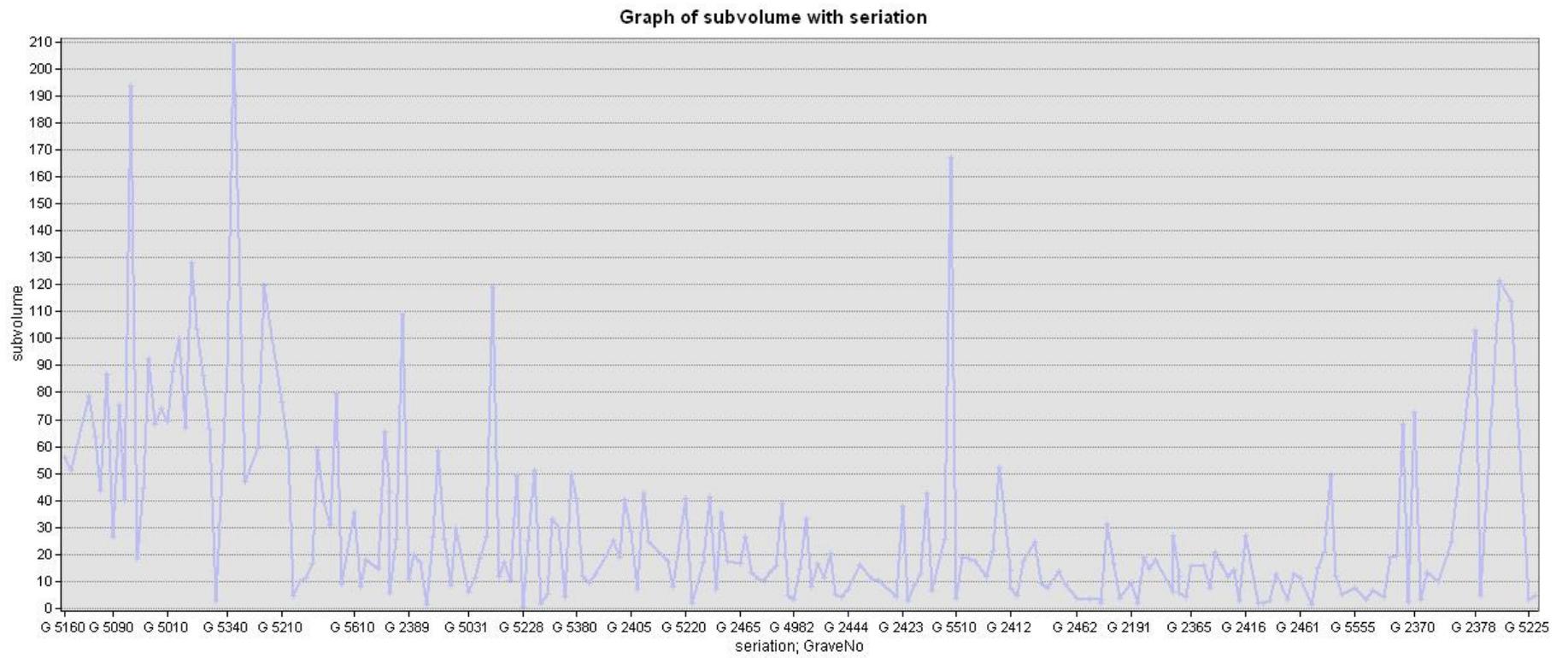


■■■■■■■■■■

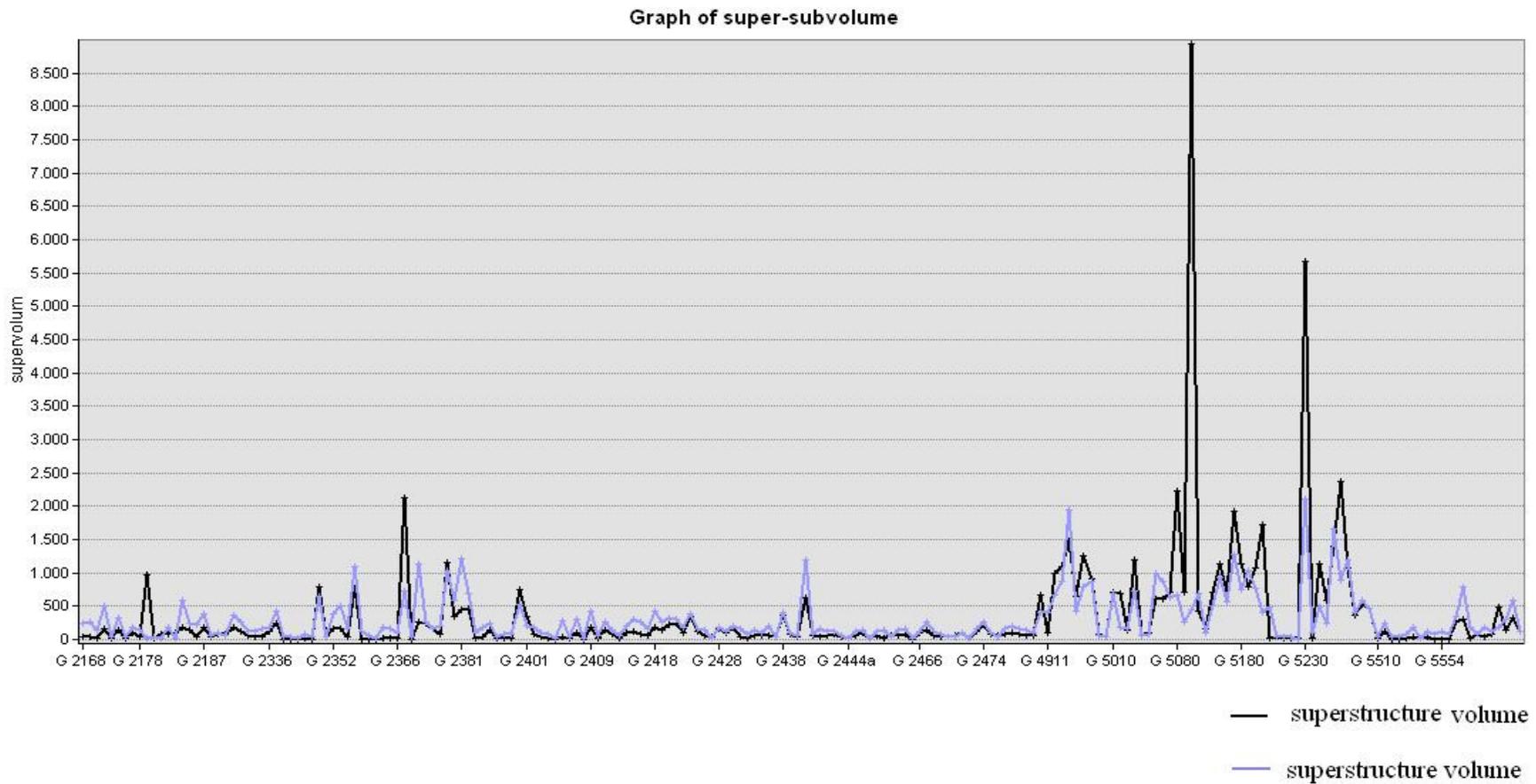
Graph 6.1: superstructure volumes of CEE cores over time²

2

Tombs G 5230 and G 5110 were excluded from this representation for their extreme values



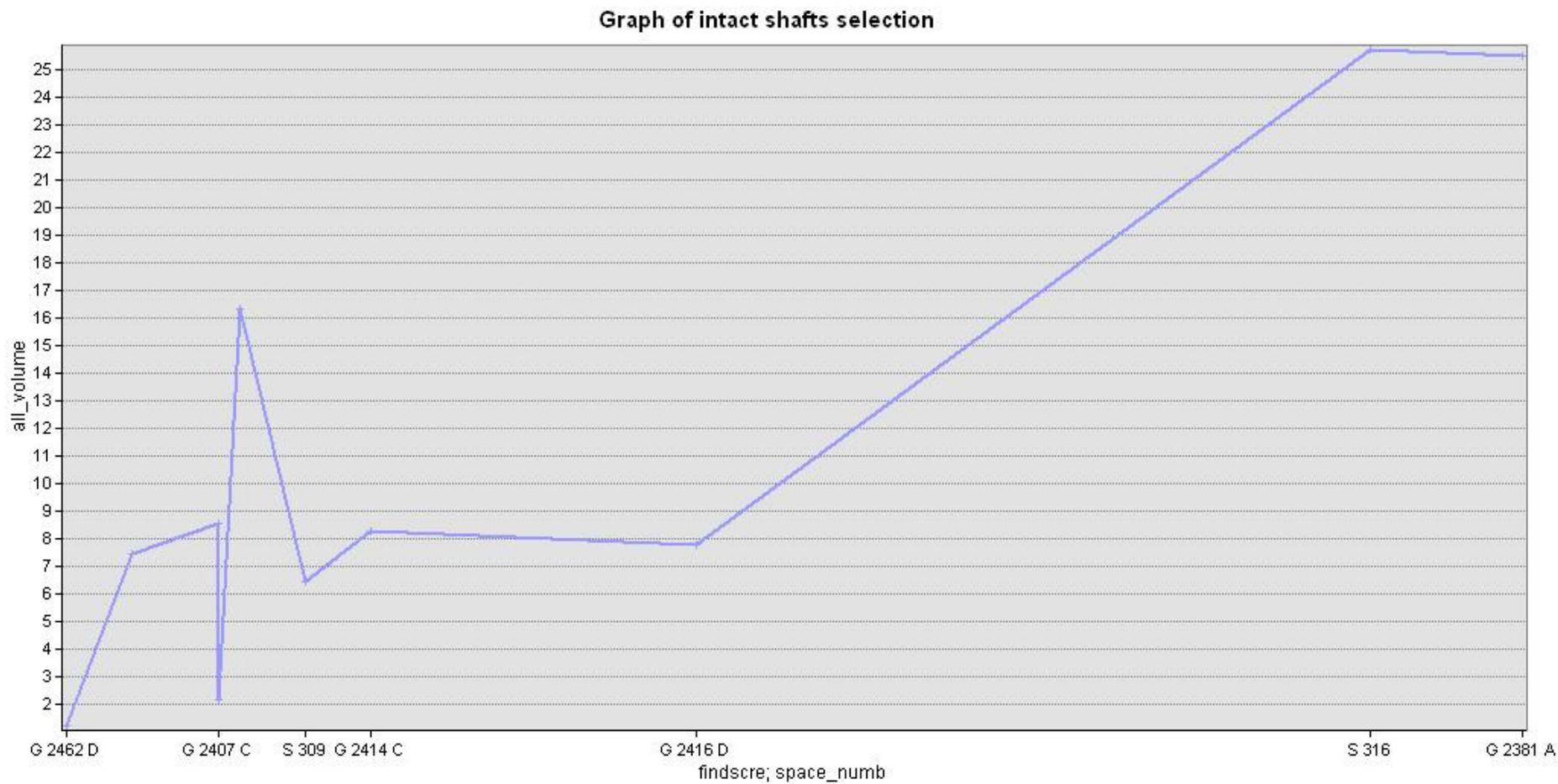
Graph 6.2: subterranean volume of CEE tombs over time



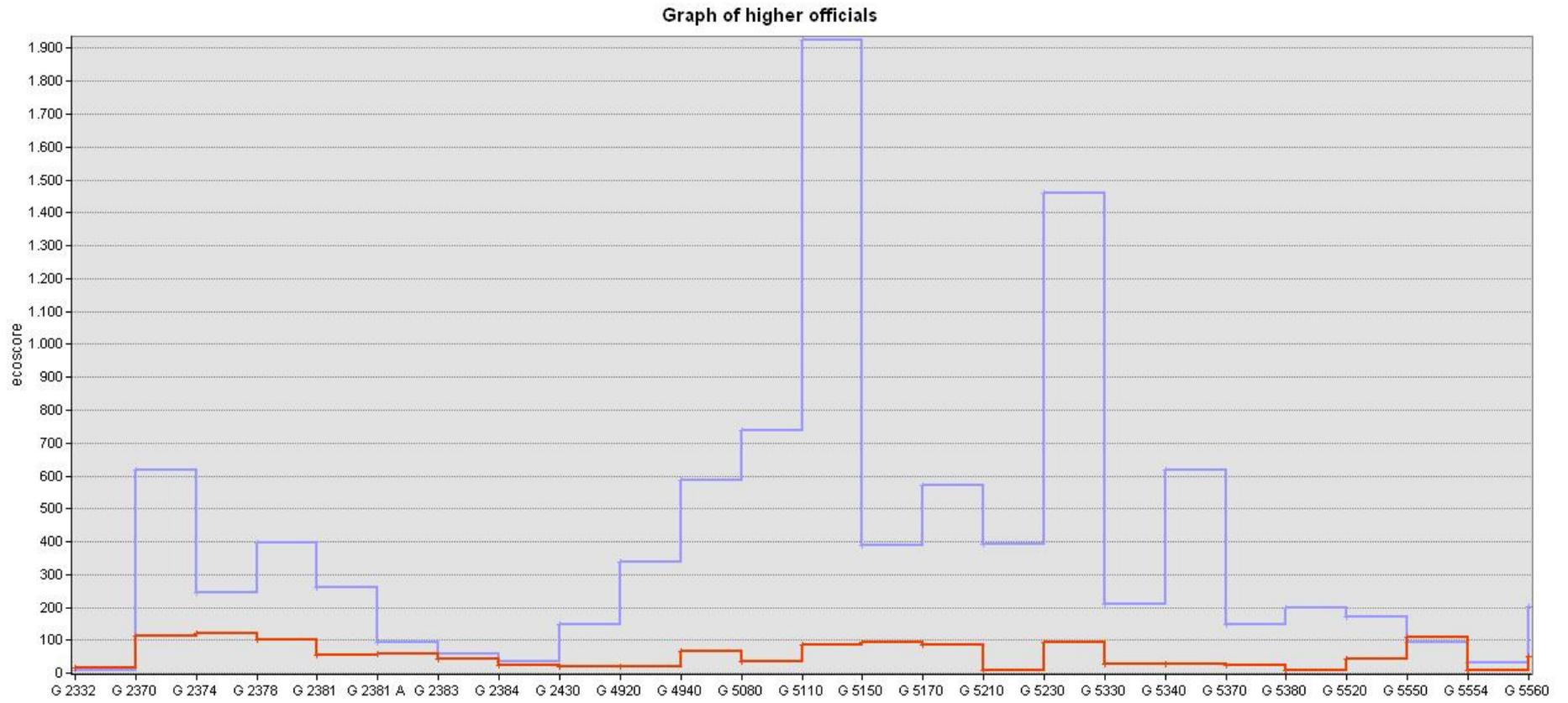
Graph 6.3: volume of substructure² and superstructure for CEE tombs³

³

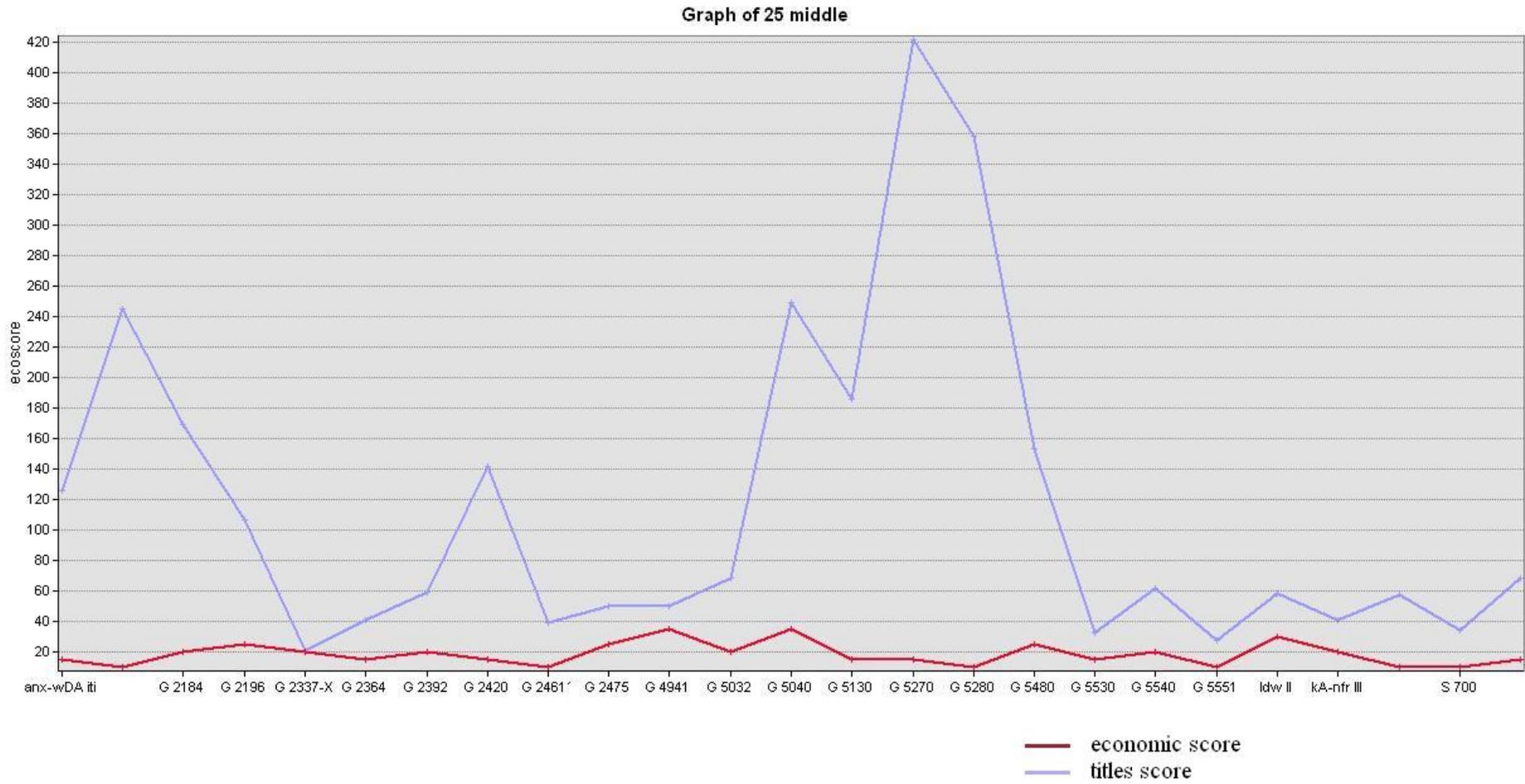
The volume of substructure was multiplied by 10 for clarity of representation



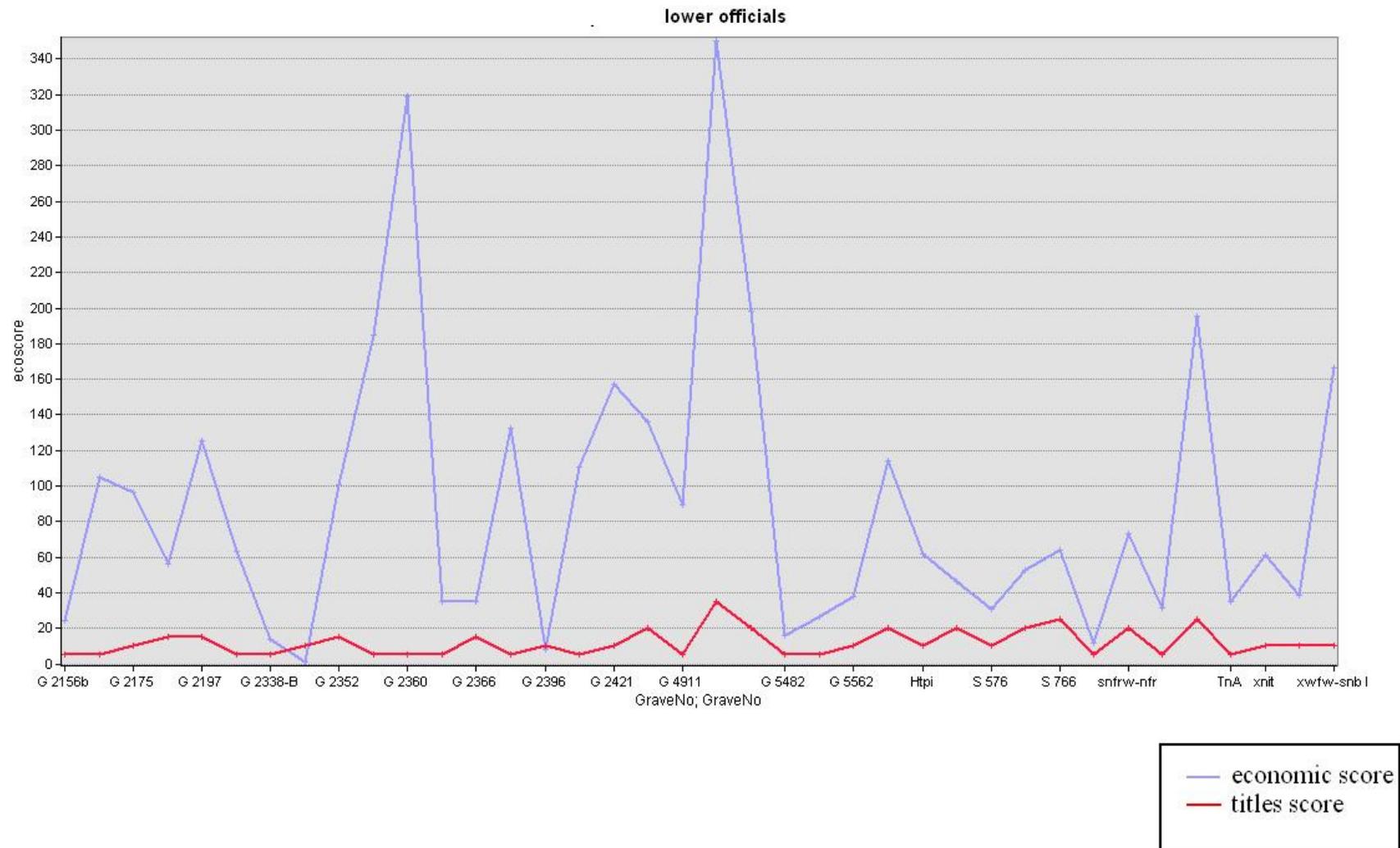
Graph 6.4: relationship between volume of intact shafts and score of their grave goods



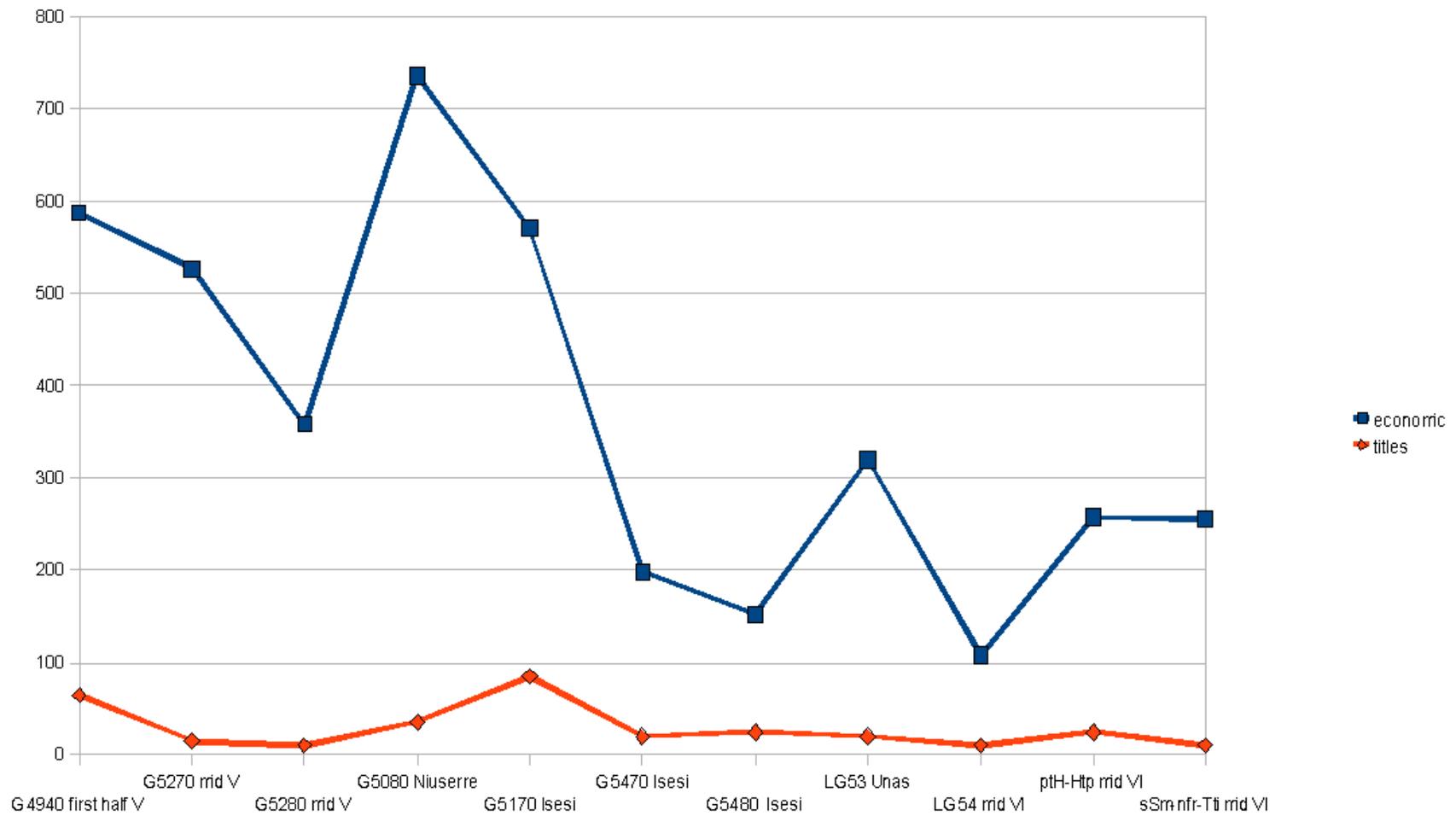
Graph 6.5: economic and titles scores for viziers and higher officials



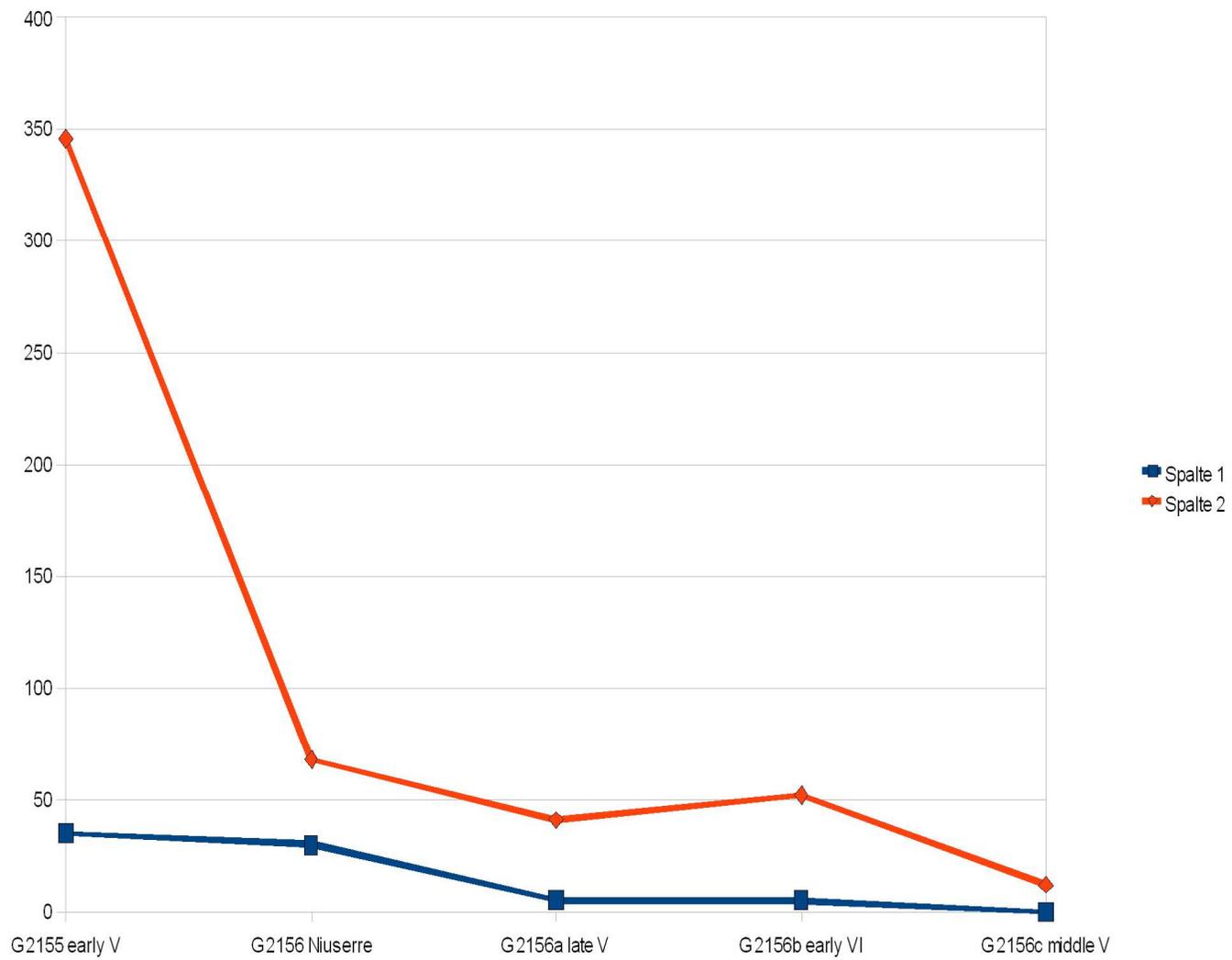
Graph 6.6 : economic and titles scores for middle officials



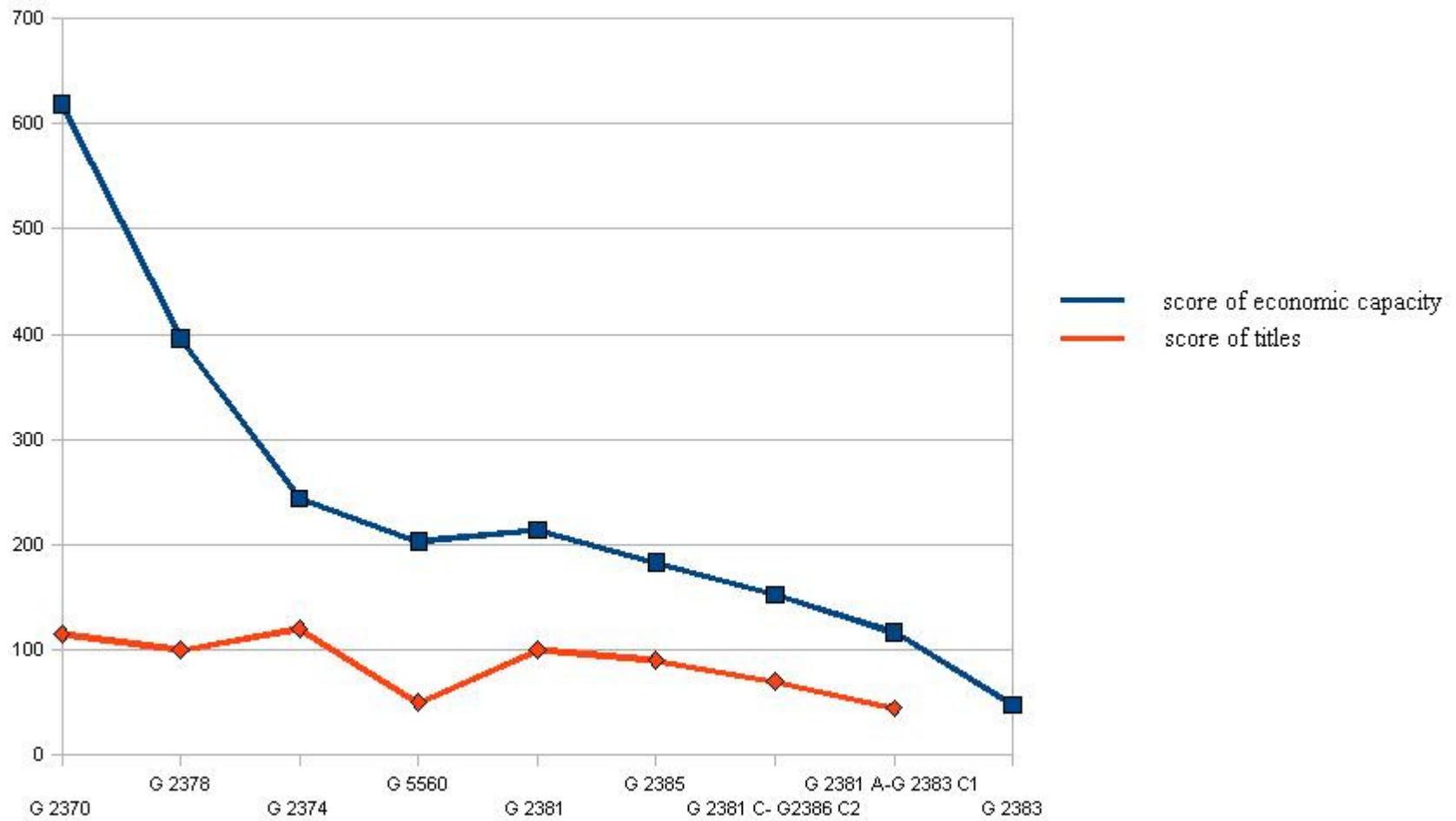
Graph 6.7: economic and titles scores for lower officials



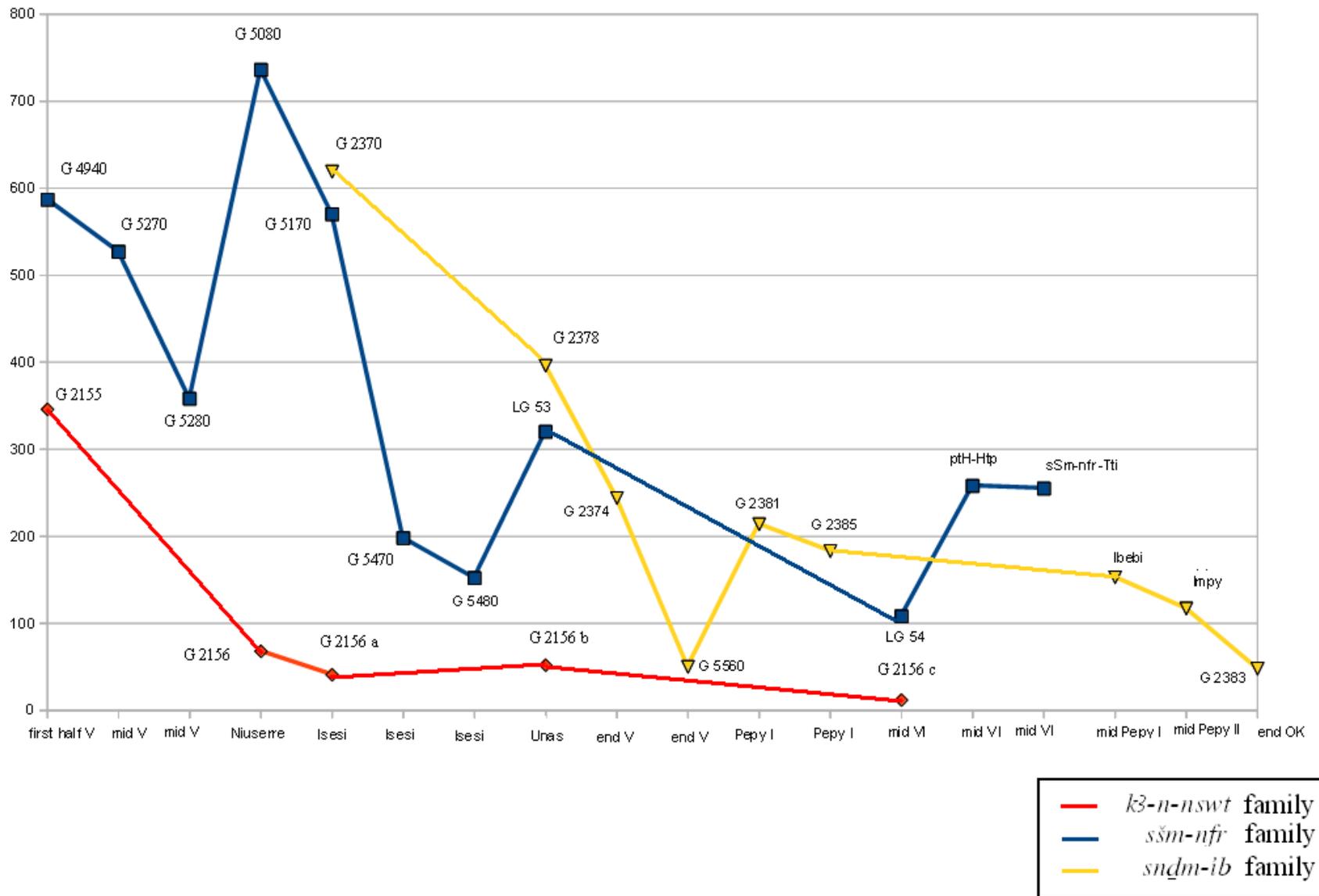
Graph 6.8: scores of titles and economic capacity
for *sšm-nfr* family members



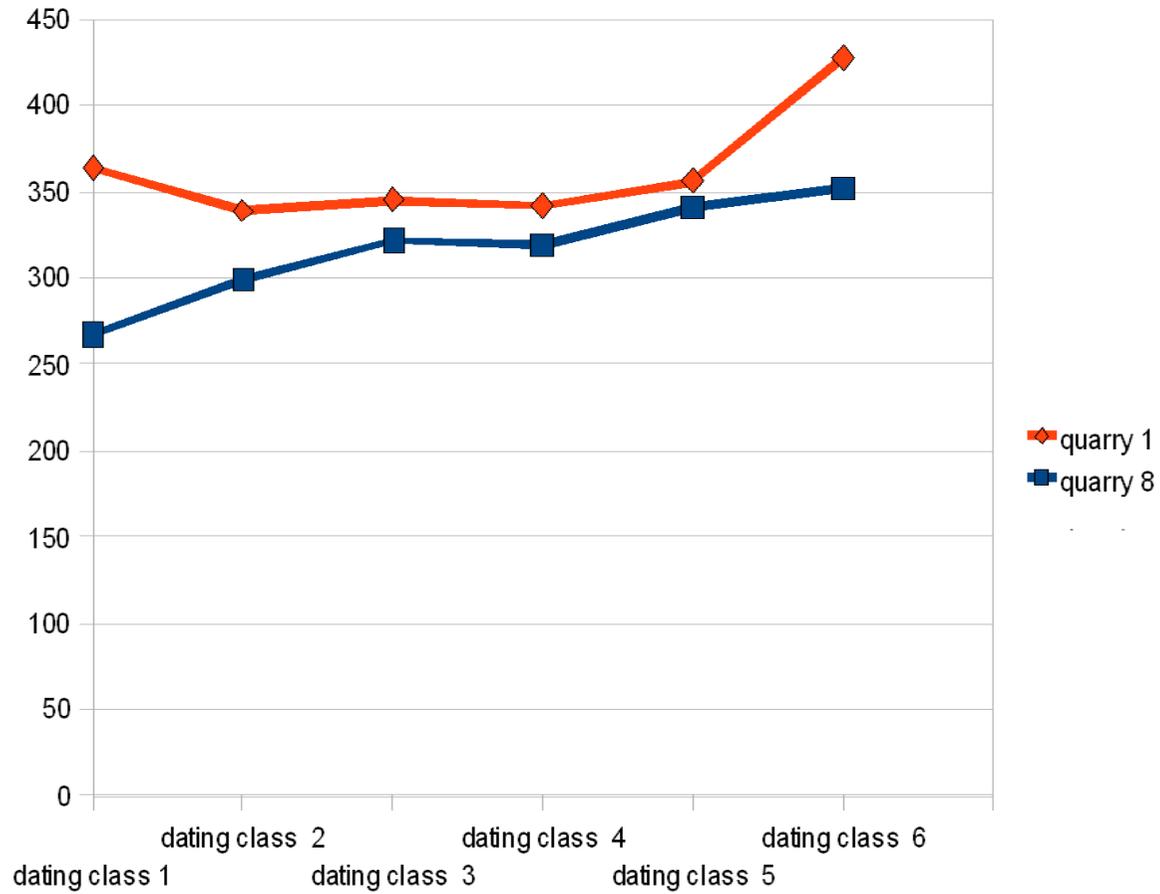
Graph 6.9: scores of titles and economic capacity for *k3-n-nswt* family members



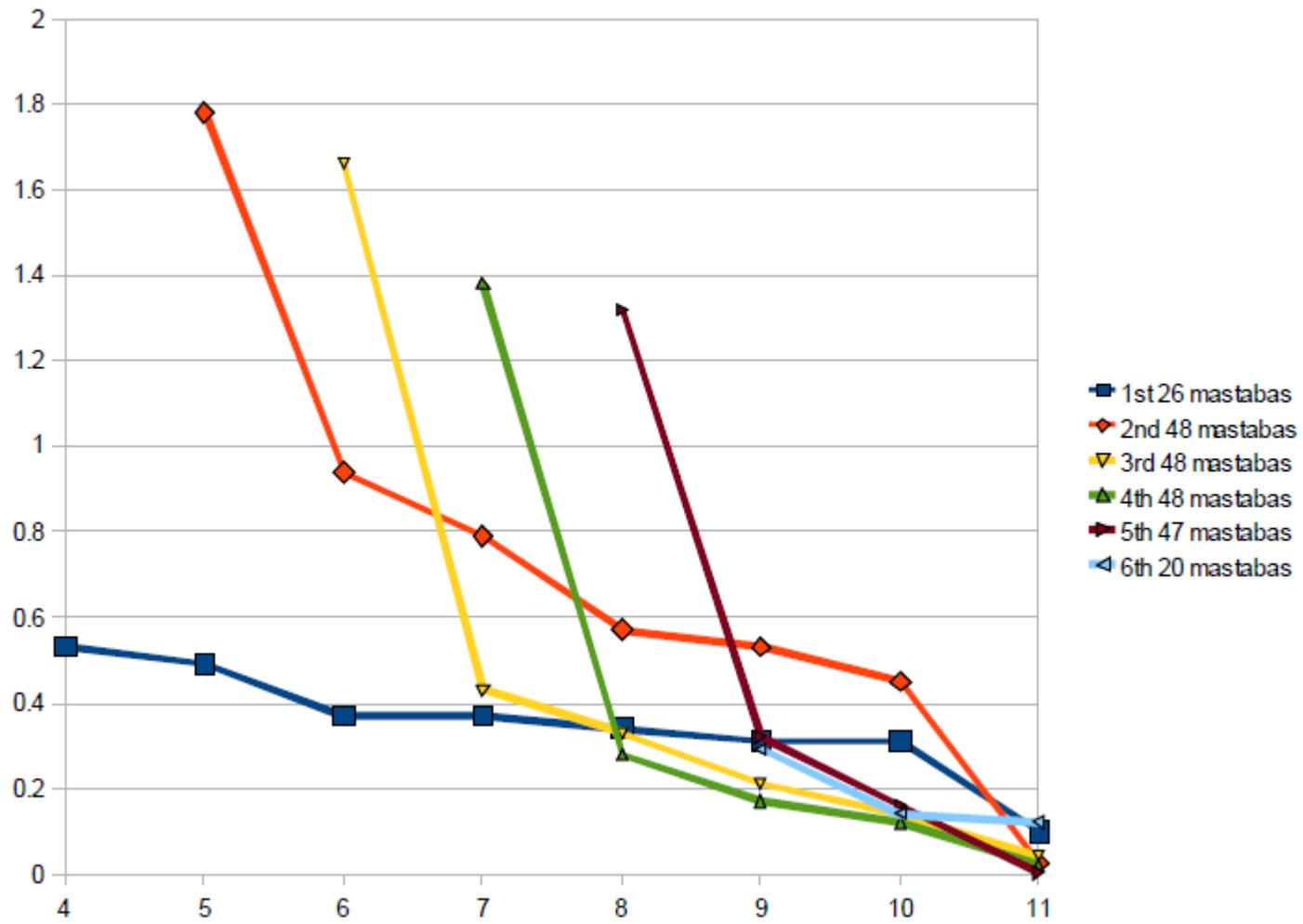
Graph 6.10: scores of titles and economic capacity for *sndm-ib* family members



Graph 6-11: Time line for the economic capacity of three families

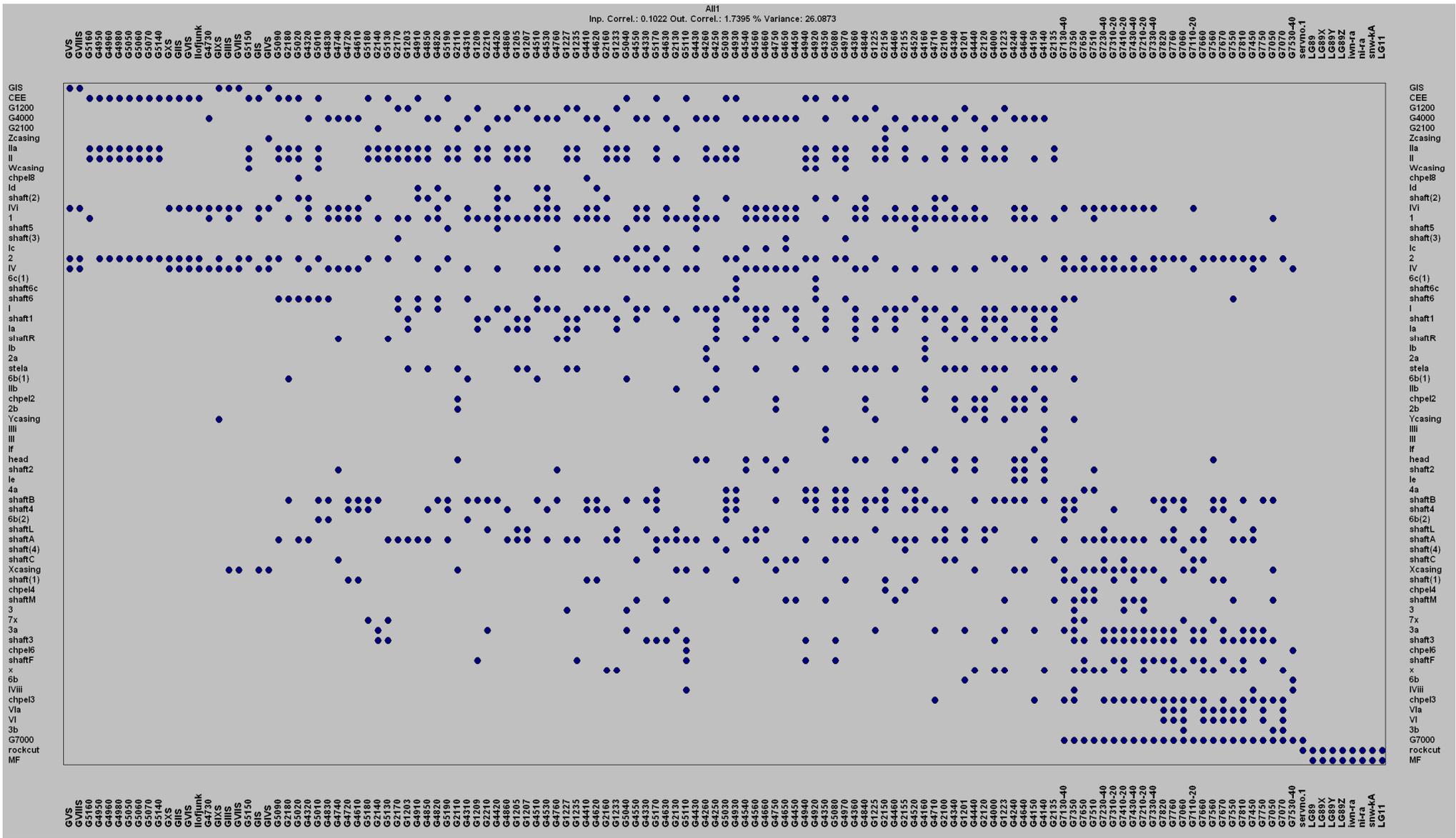


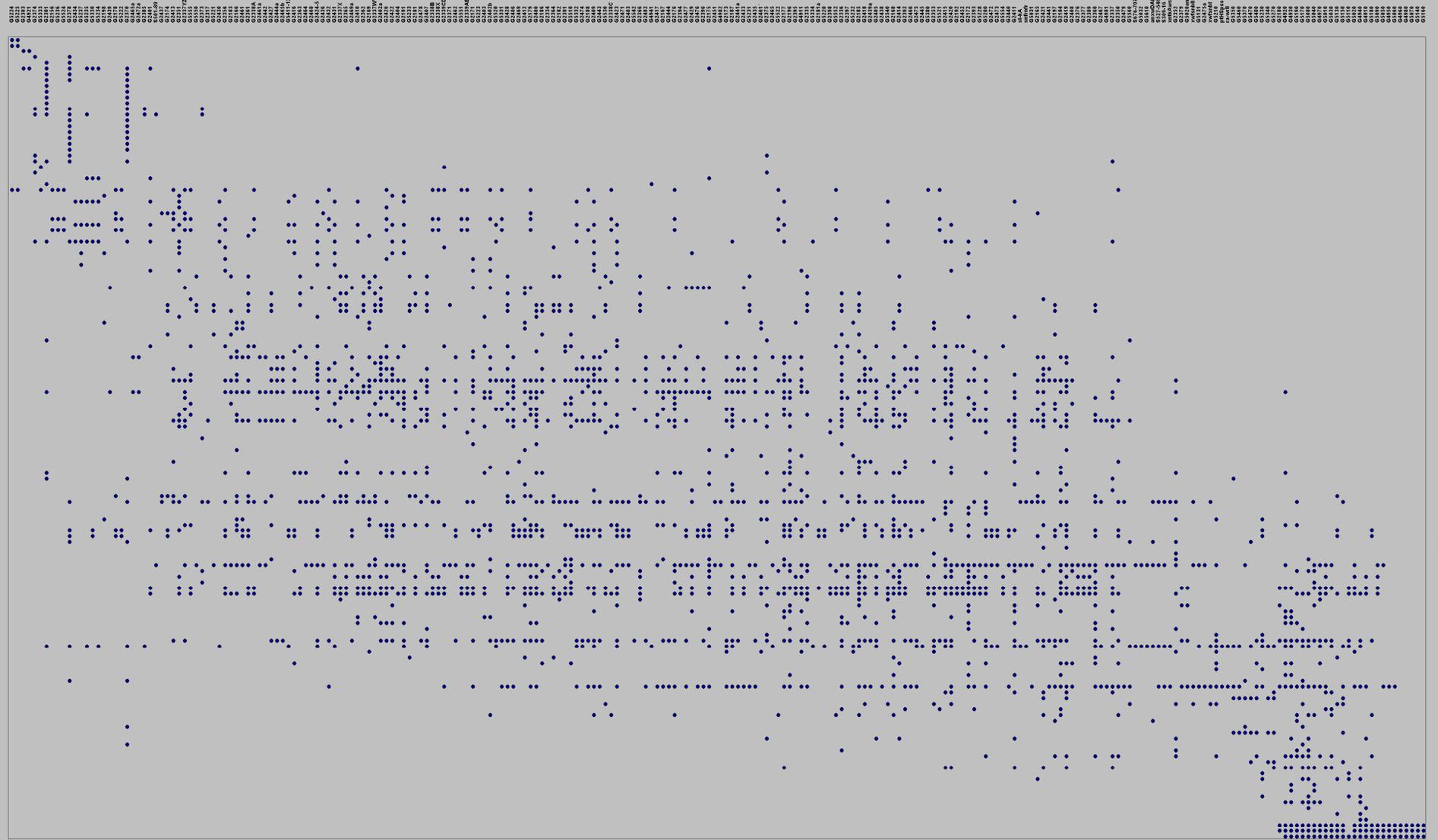
□ Graph 7.1: Means of effort estimation of quarries 1 and 8 during the 6 dating classes



Graph 7.2: Accessibility index for CEE during the 6 dating classes

Seriation Graphs





Seriation Graph 3.2

Plates



pl. 4.1 Architrave of G 2391

courtesy GA



pl. 4.2: part of the north stela in G 5554

courtesy GA

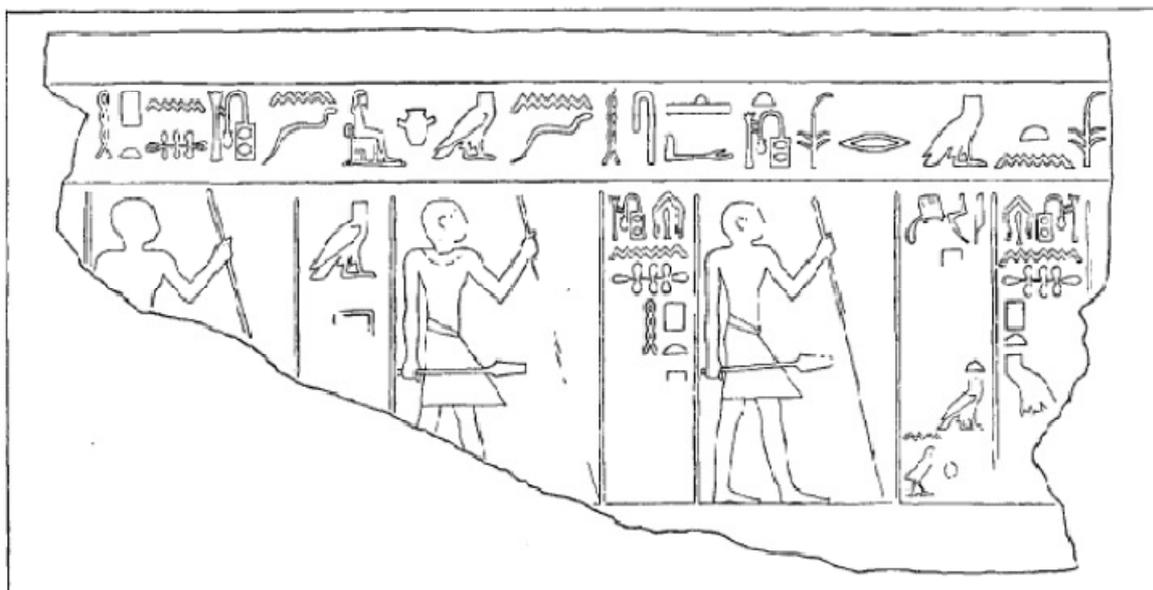


pl. 4.3: architrave of G 5562

courtesy GA



Pl. 4.4 fragment of G 2362 courtesy GA



Pl. 4.5: a fragment from S 660-661 after LD Text I, 62.



pl. 4.6: fragment of G 2396

courtesy GA



Pl. 4.7: Architrave of G 2338 B

courtesy GA



pl.4.8: fragment of G 5551

courtesy GA



Pl.4.9: View for the eastern wall of CEE from G 5220



Pl.4.10: View for the northern wall of CEE from G 5010



Pl.4.11: View for CEE from the northeastern corner



Pl.4.12: View for CEE looking east from G 5060



Pl.4.13: View for CEE view looking northeast from G 5280



Pl.4.14: View of CEE looking west from G 2378



Pl.4.15: The area to the north of snDm-ib complex



Pl.4.16: Façade of G 2370



Pl.4.17: Façade of G2378



Pl.4.18: Façade of G 2380



Pl.4.19: Façade of G 5110



Pl.4.20: Façade of G 5130



Pl.4.21: Façade of G 5140



Pl.4.22: The snDm-ib complex looking west



Pl.4.23: The snDm-ib complex from southwestern corner



Pl.4.24: G 5210 (right) and G 5220 looking north



Pl.4.25: Façade of G 5210



Pl.4.26: Façade of G 5230 with G 5330



Pl.4.27: Façade of G 5230 and a part of G 5330 (left)



Pl.4.28: Façade of G 5370



Pl.4.29: G 5411-12 looking south



Pl.4.30: Façade of G 5040



Pl.4.31: Entrance of G 5040



Pl.4.32: Façade of G 4910



Pl.4.33: Façade of G 5140



Pl.4.34: Façade of G 4930



Pl.4.35: Façade of G 4950



Pl.4.36: Façade of G 4970



Pl.4.37: Façade of G 5050



Pl.4.38: Façade of G 5080



Pl.4.39: Road between G 4910 and G 5010 looking north



Pl.4.40: Road between G 5050 and G 5150 looking south



Pl.4.41: Road between G 5050 and G 5150 looking south



Pl.4.42: Space between G 4940 and G 5040 looking west



Pl.4.43: Space between G 5110 and northern wall of CEE looking east



Pl.4.44: Space between G 5210 and G 5110 looking north