

## THE DRY MOAT, THE SOUTH ROCK WALL OF THE INNER SOUTH CHANNEL

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I am honoured to contribute to the Festschrift of Manfred Bietak. He has thrown light on a dark episode of our Ancient History; very exciting were Minoan paintings which he found at Tell el-Daba<sup>a</sup>. These paintings were the subject for a seminar in the summer of 1997 at the beautiful island of Corfu in the Ionic sea; apart from the pleasure of our work at the lecture hall we had a wonderful time.

My present article considers the little evidence there is from the site of the dry moat. In fact: the tip of an iceberg buried in the desert surrounding the step pyramid complex. In the late seventies – of the last century, during my visits to Saqqara and investigating aerial photographs, I noticed the presence of a great trench surrounding the step pyramid complex. It reminded me of medieval moats; but with no water! I thought of it as a ‘dry moat’. In 1985 I presented a paper in Munich, in 1988 an article in London, and in 1995 the meaning of the plan was discussed in Rhode Island.<sup>1</sup> The dry moat is a subsidiary to the step pyramid complex, and its diagonal, axis and corners have remarkable relationships with the monuments of the early Old Kingdom at middle Saqqara.<sup>2</sup> Adding to those studies, my present article points out that:

At the bottom of the south rock wall of the inner south channel, some spectacular compartments were tunnelled at 4 levels.

The inner south channel was completely buried and could not be seen on the maps of Lepsius and de Morgan, and does not appear on early aerial photographs in: Capart, Firth–Quibell, Lauer and Breasted Jr.<sup>3</sup> It was due to the large-scale excavations by the late Selim Hassan in 1937–1938 and the late Zaki Saad in 1939–1943 that some parts of this channel were revealed, though never considered as part of a

greater trench (dry moat) surrounding the step pyramid complex. Since then the inner south channel appeared as 2 depressions on aerial photographs in publications by: Goneim and Emery<sup>4</sup> and on the map *Le Caire*, H-22.

The present plan of the inner south channel of the dry moat (Figs. 1, 2) will help find positions mentioned in the text by their names or coordinates. It goes as far as the pyramid of Unas. Some distances are estimated with respect to the monuments in the background of reference photographs.

Similar to the other channels it is an artificially rock cut trench measuring about 410 metres in length and 40 metres in width. Over the centuries it was filled with debris and wind blown sand; but at 2 places it had been filled up intentionally as foundations for 2 groups of mastabas in the positions *B-C*, 7–9 and 2–5 on the plan. They are referred to as the ‘eastern filling’ about 100 metres and the ‘western filling’ about 90 metres. Alternating with the fillings are the ‘eastern depression’, about 80 metres and the ‘western depression’ about 140 metres.

The eastern limit cannot be determined: it is somewhere near the mastaba of Bebi, in an area which has not been investigated. The western limit is the southwest corner of the dry moat, a short distance from the complex of Sekhemkhet.

A short investigation of the north bank of the channel is followed by a more detailed one of the south bank of the channel. Both banks are divided into 3 areas.

### THE NORTH BANK OR ROCK WALL OF THE DRY MOAT

To the north of the channel-bank are the rock foundation-platform and the temenos wall of the step pyramid complex.<sup>5</sup> The channel extends beyond the

<sup>1</sup> N. SWELIM, 1988, The Dry Moat of the Netjerykhet Complex, in: J. BAINES, T.G.H. JAMES, A. LEAHY, A.F. SHORE (eds.), *Pyramid Studies and Other Essays Presented to I.E.S. Edwards*; 1995, F.D. FRIEDMAN, *JARCE* 32, 41.

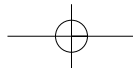
<sup>2</sup> N. SWELIM, Some Remarks on the Great Rectangular Monuments of Middle Saqqara, *MDAIK 47 Festschrift Für Werner Kaiser*, 389–402, Mainz, 1991.

<sup>3</sup> Before 1924 in: J. CAPART, *Memphis à l'ombre des Pyramides*, pl.

XIV; June 1924 in C.M. FIRTH and J.E. QUIBELL, 1935, *The Step Pyramid II* pl. 6 #1; December 1927 in: J.PH. LAUER, *La Pyramide à degrés II*, 1936 pl. II # 1 and 1933–1934 in: BREASTED JR., *Field Museum of Natural History Bulletin*, November 1981, 3.

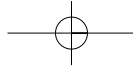
<sup>4</sup> Z. GONEIM, 1957 *Horus Sekhemkhet*, pl. 1; W.B. EMERY, *JEA* 51, 1965, pl. 2.

<sup>5</sup> J.-PH. LAUER, 1962, *Histoire monumentale des pyramides d'Égypte I*, 182, fig. 55, note that channel (cc) is 40 metres wide.









limits of the temenos to the east and to the west; see position *B 0–9* on the plan.

The first area runs for a distance of about 100 metres, along the mastabas of Simery, Nykaupthah, Bebi, (X), (W) probably built on rock,<sup>6</sup> to the mastaba of Kairer, partly built on the ‘eastern filling’; see position *B 9–7* on the plan.

The second area runs for a distance of about 170 metres along a row of rock tomes of: Iarti, Ankhi, Snofruhotep, Nedjem, and the mastaba of Mehu in the ‘eastern depression’; and the mastabas of: Sesheshtet, Idut, Unasankh, Iyefret and Haishtef, on the ‘western filling’; see their positions *B 7–2* on the plan. The third area runs for a distance of about 140 metres along the ‘western depression’; from west of the mastaba of Haishtef to the inner south west corner of the dry moat. No investigations have taken place here and in modern times it became a convenient low level area for archaeological dumps. See position *B west of 2* on the plan.

#### THE SOUTH BANK OR ROCK WALL OF THE DRY MOAT

To the south on the opposite bank are several mastabas of high officials, at least 2 underground galleries of tombs of 2<sup>nd</sup> dynasty kings, 2 mastabas of 5<sup>th</sup> dynasty queens, one mastaba of a princess and the pyramid complex of Unas;<sup>7</sup> see position *C 0–9* on the plan.

At this site the apparent sections made in the desert rock, revealed that at the surface and at a few metres below are hard rock strata of limestone, below each are soft layers. These hard rock strata serve as foundations, roofs and lintels throughout. They will be referred to as the ‘upper hard rock stratum’ and the ‘lower hard rock stratum’.

#### The first area along the south rock wall

The ancient project of constructing the dry moat was probably left incomplete. Patches of rock were not removed from the east of the channel. Later when the site became vulnerable, the mastabas of Bebi, (X), (Y), Hotep and 10 shafts were founded in such patches; while the mastabas of Kairer, (W), and (Z) were partly founded in the ‘eastern filling’.

The first area runs for about 100 metres; 40 metres of which were excavated. See position *C 9–7* on the plan. By the south rock wall are a series of deep and narrow compartments in line. At the eastern end rubble partly covers the eastern compartment and at the western end the western compartment is blocked with rubble.

The only work conducted on these compartments was during the excavations of Selim Hassan in 1937–8. By his death in September 1961 the report had not appeared, and not until February 1974 did the late Zaki Iskander rescue some field notes and edit a manuscript which appeared in 3 volumes. They saved a lot of primary material from being lost. Unfortunately the volumes were not as good as the author or the editor would have liked them to be. In the editor’s note he mentions ‘The unprepared pages were in most cases those dealing with the description ...’ it was such descriptions that would have provided information and perhaps measurements of the compartments.<sup>8</sup> Important photographs from this report, however, are referred to. They will help understand relative positions at the site and appreciate the magnitude of such an excavation, but they cannot be copied.

#### The eastern compartment

No one knew of this compartment until it was excavated in 1937. In S. Hassan’s report two photographs, taken before the clearance began, show the rails of his decauville going over a flat area towards mastaba (Z),<sup>9</sup> in other words, running over the completely buried mastaba of Ankhi, 10 shafts, the eastern and middle compartments. The clearance of the eastern compartment brought 3 rock walls to light, the 4<sup>th</sup> to the east, if it exists is still buried, see Pl. 1.

The north rock wall is directly under the south wall of the mastaba of Bebi which was built on the ‘upper hard rock stratum’. Under it is: a long horizontal and a short square cavity, with shores of wood and bricks to support the roof. Beyond the corner of the mastaba to the east is a cut in the rock wall, patched up with bricks which disappear in the rubble.

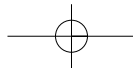
<sup>6</sup> In the references on this area there are a few unnamed mastabas or they are given uncertain names. To avoid any confusion I have referred to them by letters between brackets. In the corridor between the mastabas (X) and Bebi lies a block with an inscription of Metri. His tomb is certainly in this area, but there are conflicting reports whether mastabas (X) or (Z) belong to him. Other mastabas are

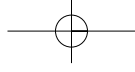
referred to in the present plan as (V), (W) and (Y).

<sup>7</sup> Unfortunately a survey carried out by Ana Tavares in 1993 has not appeared during the last 10 years.

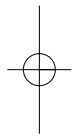
<sup>8</sup> S. HASSAN, Z. ISKANDER (ed.), 1937–1938, *Excavations at Saqqara*, 3 vols., Cairo 1975.

<sup>9</sup> S. HASSAN, vol. III, pl. XXXV a, b.





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Mastaba Z  
Hotep  
Ankhi



Mastaba of Bebi  
SE-Corner of Bebi

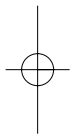


Plate 1

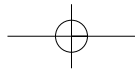




Plate 2

The south rock wall runs in a curved line and its vertical plane bulges in. Very close to it are 10 deep shafts. The sides of 4 eastern shafts were cut into the compartment wall. Above the west part of the wall the 'upper hard rock stratum' was destroyed. Consequently some shafts, part of the mastabas of Ankhi and Hotep were founded at a lower level, see Pl. 1.

The west rock wall separates the eastern compartment from the middle one. The upper part of this wall was cut in a more regular manner and has a window-corridor half way from the surface. The 'upper hard rock stratum' above extends a little over the west rock wall, suggesting that this was part of a destroyed rock roof.

In Pl. 1, we see 5 shafts, the lower courses of the east wall of Hotep, and some brickwork of Ankhi. To the south in line with the west wall below the masta-

ba of Hotep, is a cave roofed by the 'upper hard rock stratum'.

The north side of the mastaba of Hotep was built on the filling in the compartment.<sup>10</sup> The south side was built on the 'upper hard rock stratum'. The east side was founded on a lower level. The west side extends north over the west rock wall of this compartment. Three corners have survived but the 4<sup>th</sup>, the northeast corner was destroyed by removing the filling in the compartment below.<sup>11</sup>

#### The middle compartment

The middle compartment is a short rock cut trench over the rock wall, to the north and south are mastaba (X) to the north and (Y) to the south. Over the rock walls to the east and west are the mastabas of Hotep and (Z). Three rock walls are level with the 'upper hard rock stratum', the 4<sup>th</sup>, to the south, is lower because the stratum was removed. Mastaba (Y) is on this lower level, it looks confusing.

Like the eastern compartment, the south rock wall runs in a curved line and its vertical plane bulges in. Through the eastern and the western walls are 2 similar window-tunnels in line connecting this compartment to the eastern and the western, see Pl. 2.

In the west rock wall below the window-tunnel is an opening where the burial chamber, probably of mastaba (Y) or (Z) had broken into the middle compartment. The chamber lies under the western compartment and houses a large limestone sarcophagus which had been plundered. The roof had been shored by wooden beams in modern times.

Plates 3 and 4 show that the 'upper hard rock stratum'; not only tops the 3 walls mentioned, but also extends over parts of the compartment. The middle compartment was most probably tunnelled through the window-tunnels!

#### The western compartment

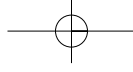
The middle and western compartments are separated by a rock wall, with a window-tunnel, 5 metres long. The floors of the compartment and the window-tunnel seem to be level and extend under mastaba (Z). The western compartment is filled with rubble; a limited clearance reveals neatly cut corners to the east and a light brown coloured rock roof.

Mastaba (Z) is a great monument built on a plat-

<sup>10</sup> S. HASSAN, vol. III, 53-58.

<sup>11</sup> S. HASSAN, vol. III, pl. XXXVII b, is a photograph showing that the northeast corner of the mastaba was in tact

before the clearance; the caption refers to the compartment as 'the great passage under this Mastaba'.



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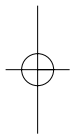
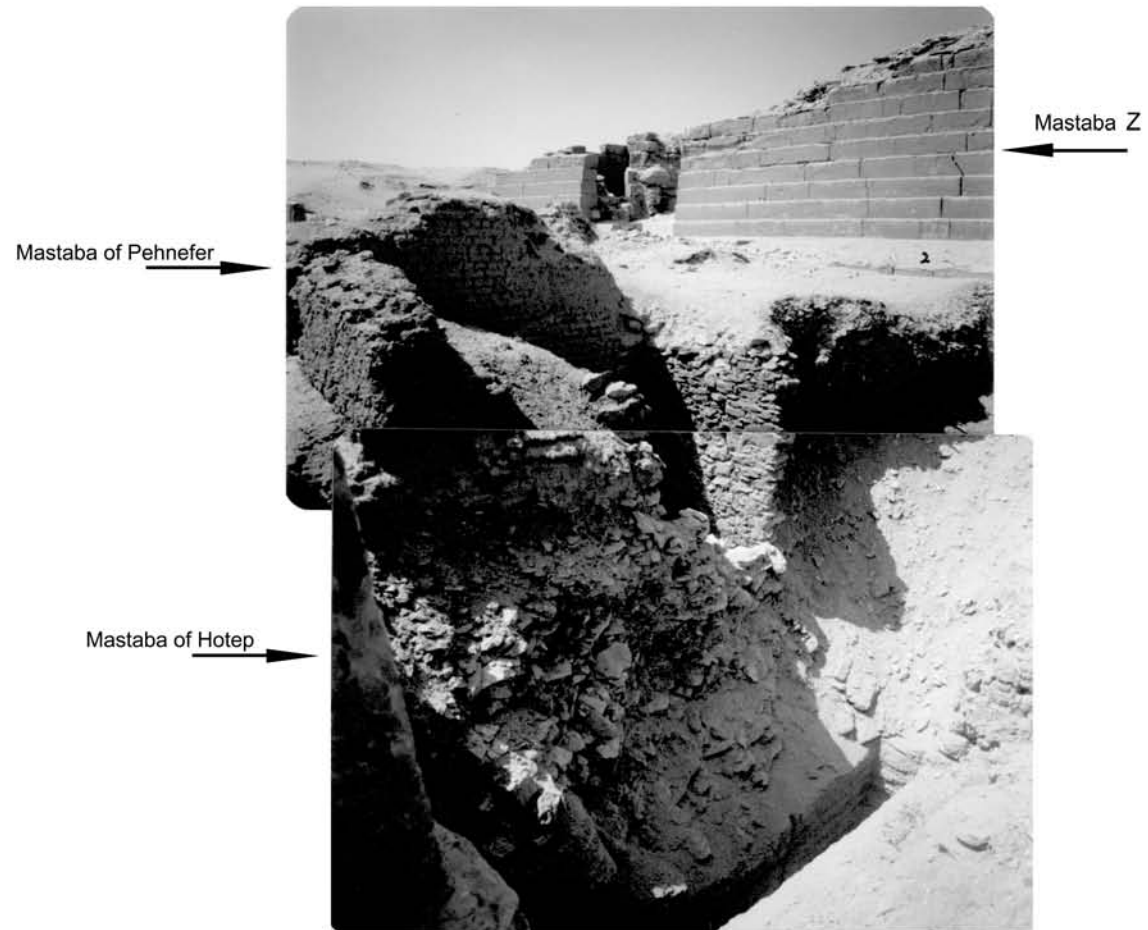
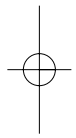
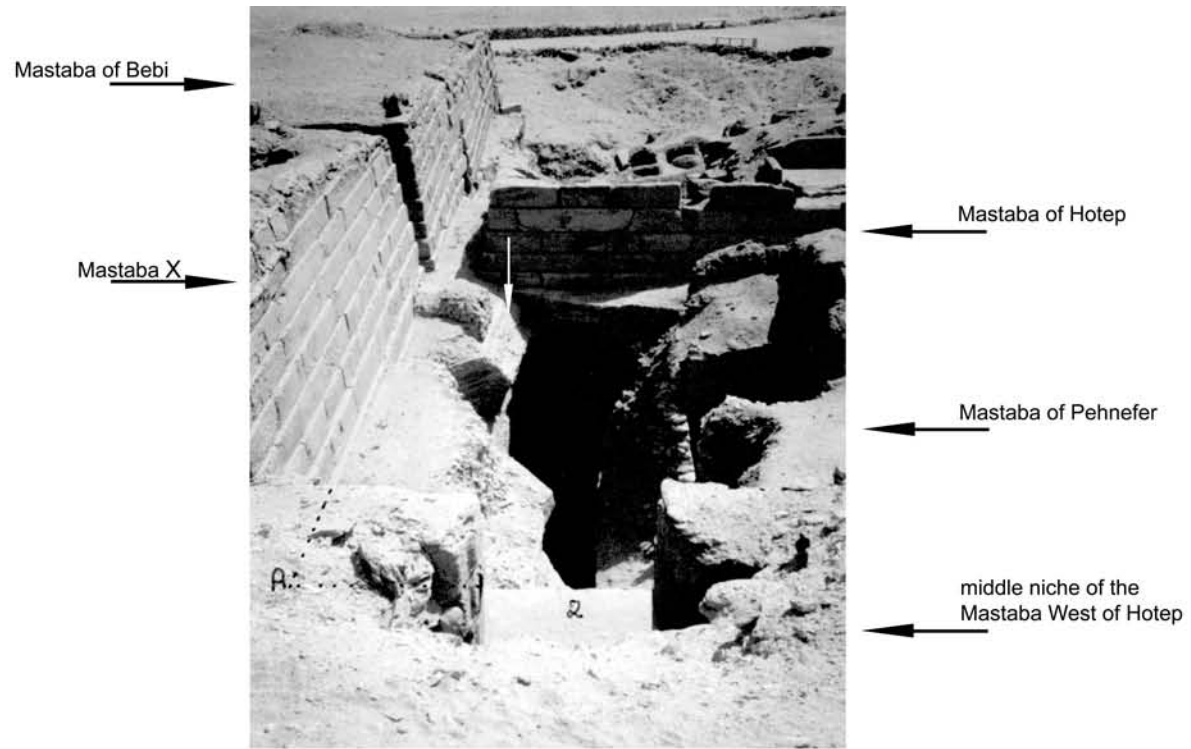
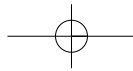


Plate 3



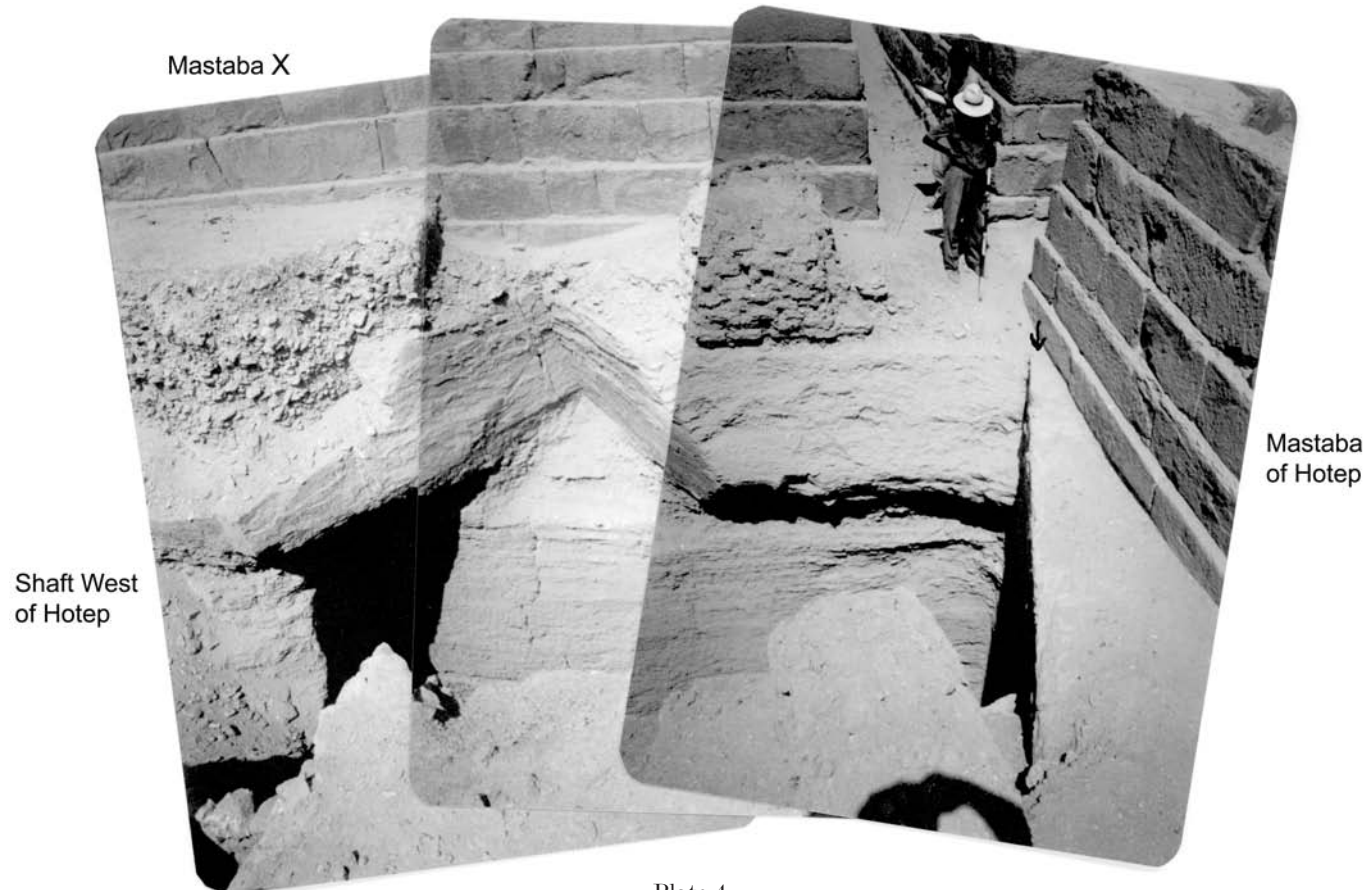


Plate 4

form of large blocks of limestone which bridge the compartment.<sup>12</sup> Vertical cracks in line with the axis of the 3 compartments are seen on the east and west sides of its superstructure.<sup>13</sup> Consequently it is logical to believe that the length of the western compartment will exceed the width of the mastaba.

#### West of the western compartment

West of mastaba (Z), are the mastabas of Kairer and (V). The former was partly or totally built on the 'eastern filling'. The latter was built on the desert rock surface by the causeway of Unas. The narrow passage between these mastabas is in line with the 3 compartments. Without an investigation or by the removal of the rubble inside the western compartment we will be

unable to know what lies beneath. Whether we have an extension of the western compartment, an additional one or nothing will remain unknown.

It is for certain that the level of the northern rock wall in this area declines, to continue topped by the 'lower hard rock stratum'. The south wall maintains its original level; topped by the 'upper hard rock stratum'.

#### The second area along the south rock wall

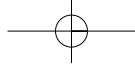
The greater parts of the second and third areas were excavated by Zaki Saad at the beginning of World War II. He spent 2 interrupted seasons: 1938–1939 and 1942–1943.<sup>14</sup> Plates 5, 7–10 illustrate part of his work. They were printed from negatives at the Saqqara inspectorate # 1906, 2097, 2095, 2776 and

<sup>12</sup> Mastaba (Z), sometimes called Metri. It occupies an area from the causeway of Unas, over the west compartment till mastaba (W). It was built on a platform the upper courses of which were dressed while the lower courses were rough. The superstructure is made of walls retaining a rubble core with an outer casing; 3 courses of which have survived on the west side.

<sup>13</sup> The crack on the eastern side can be seen since 1937, S. HASSAN, vol. III, pls. XXXV and XXXVI.

<sup>14</sup> Z. SAAD, 1940, A preliminary report on the excavations at Saqqara, 1939–1940, *ASAE* 40, 692; 1947, *Royal Excavations at Saqqara and Helwan (1941–1945)*, Supplement *ASAE* Cahier No. 3, 55–67.





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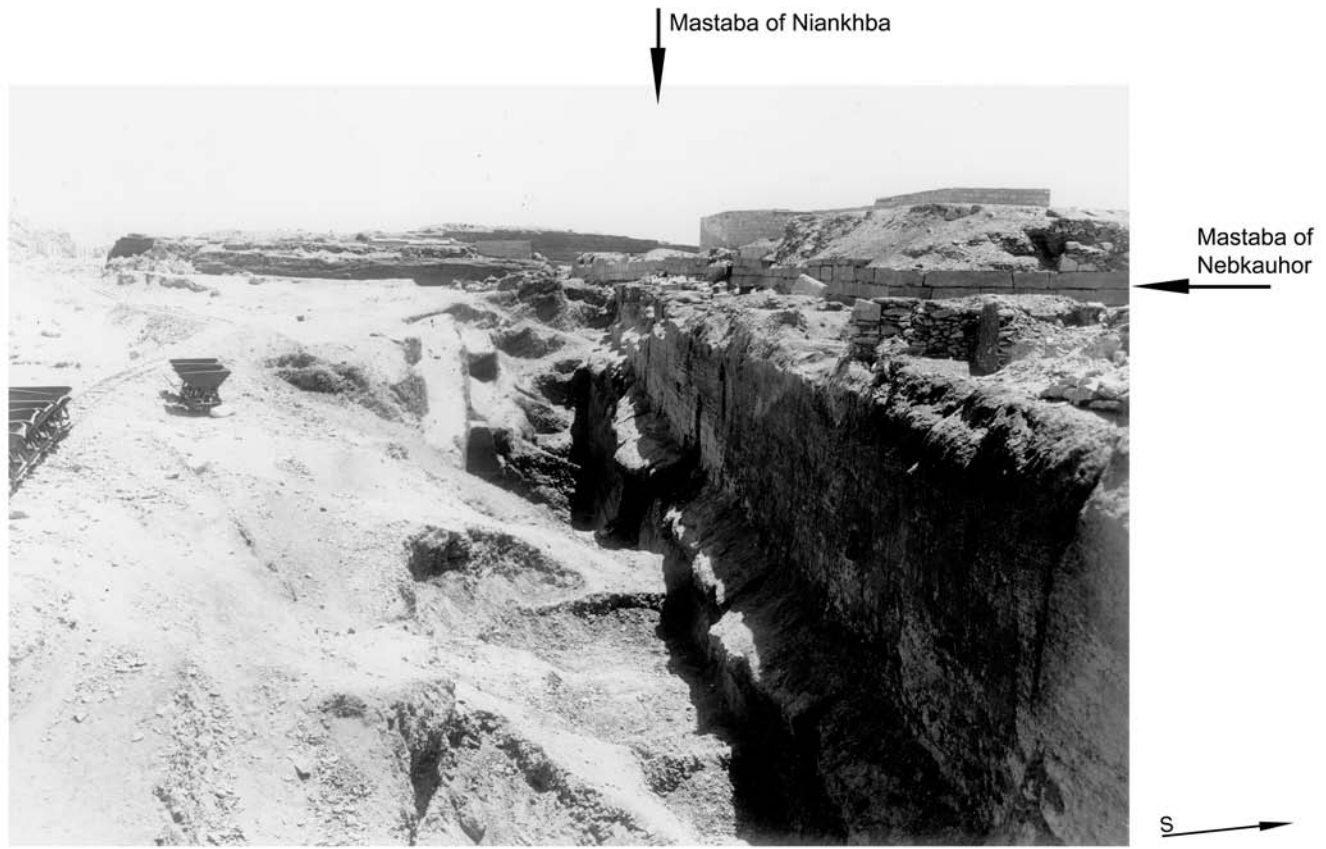


Plate 5

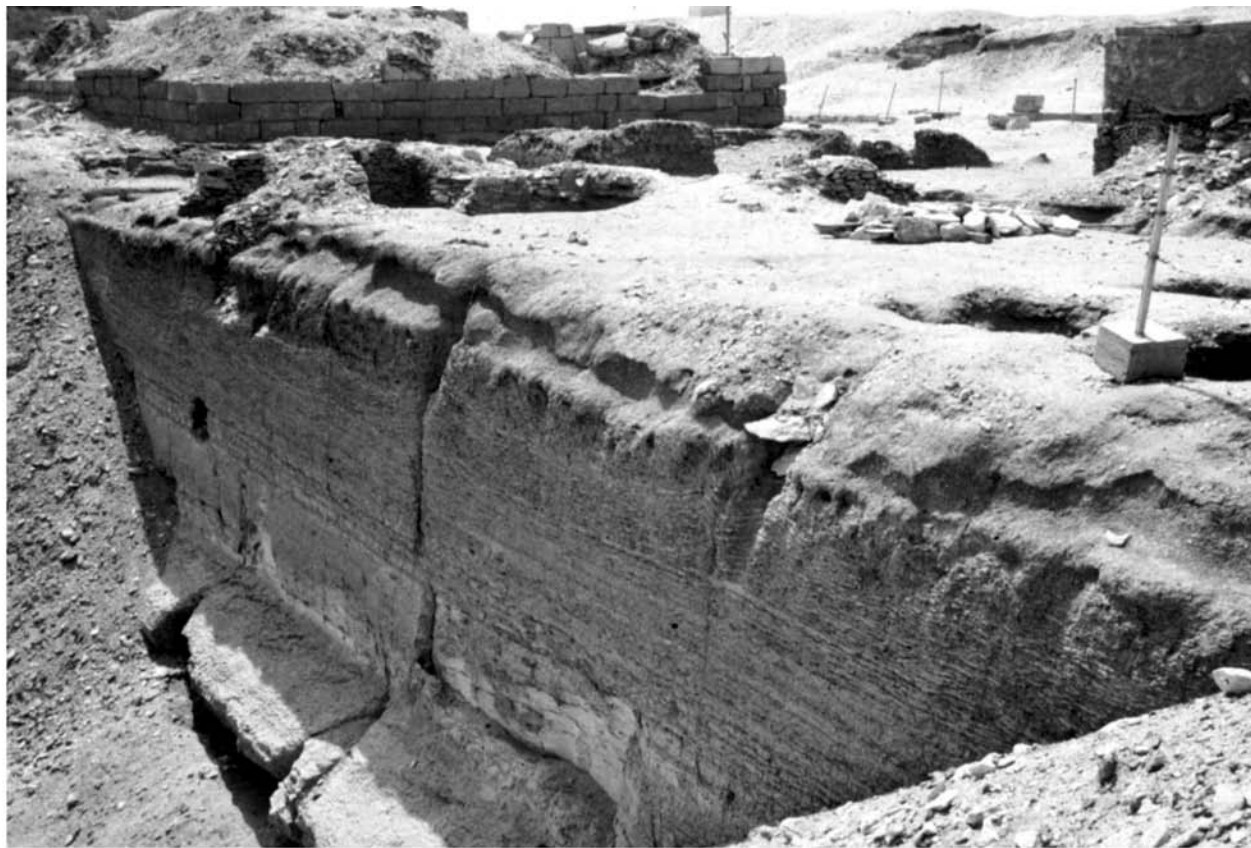


Plate 6

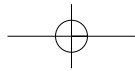
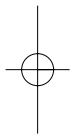
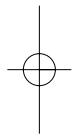




Plate 7

2790. Other photographs referred to but not published were printed from negatives # 2143, 2144, 2778 and 2791, illustrating his excavations at the third area.

The second area begins at an undetermined point 'west of the west compartment' by the south rock wall of the inner south channel, through the 'eastern filling', the 'eastern depression' and the 'western filling'; covering a distance of about 170 metres. In other words from the mastaba of Kairer to the mastabas of queens Nebet and Khenut, see position *C 7-2* on the plan. The queen's mastabas were built partly on the rock and partly on the 'western filling'. On the south side of the channel are the mastabas of Niankhba,

<sup>15</sup> Z. SAAD, 1940, 692; we cannot determine to what extent was that similarity? The stairway of the southern tomb descends in the opposite direction and the north wall was built of stone masonry to narrow the rock cut corridor, as the situation is at the entrance of the pyramid of Sekhemkhet. In that respect we can refer to the illustra-



Plate 8

Nebkauhor, Iy, Isi, Khenu and the galleries of king Nynetjer. Here the great compartment was excavated.

In 1939 Z. SAAD worked from west to east and reports that: 'To the south east of the mastaba of queen Nebet we came upon a very big descent cut in the rock. At a depth of 25 metres from the ground level we reached steps leading westward. It resembles very much the descent leading to the south mastaba of Zoser (Neter-khet). We were obliged to stop the work in this place until next season'.<sup>15</sup>

In his report of season 1942 he mentions that the area '..... already excavated from the east to the mastaba of queen Nebet in the west was about 80 metres'.<sup>16</sup> This means that there are 120 metres in the second area which could not be excavated: at: 'east-

tions published in C.M. FIRTH, J.E. QUIBELL and J.-PH. LAUER, 1935, *The step pyramid II*, Plates, Cairo, pl. 36 I, and pl. 47 'K'. (Position *A-B 3-4* on the plan). GONEIM, 1957, *Excavations at Saqqara, Horus Sekhemkhet, The Unfinished Step Pyramid at Saqqara*, Cairo, pls. XX, XXI. The masonry blocks the entrance corridor only.

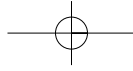


Plate 9

ern filling', part of the 'eastern depression' and the 'western filling'.

Pl. 5 shows the excavation; at the positions *C 7-4* on the plan. Investigating Pl. 5, we see: a clearance underway and the great compartment beginning to appear. The excavation has shown that the south rock wall is taller than the north one. The 'lower hard rock stratum' projects out of the south rock wall continuously.<sup>17</sup> To day the protrusion is still exposed below the area of the mastaba of Iy, on Pl. 6 and in position *C 5* on the plan. If this protrusion is the remaining part of a destroyed roof, we have to remember the levels: the great compartment lies beneath the 'lower hard rock stratum'; and that the 3 compartments lie beneath the 'upper hard rock stratum'. The change level would be found in the 'eastern filling'.

<sup>16</sup> Z. SAAD, 1947, 55-67

<sup>17</sup> A section at the opposite side in the 'eastern depression', shows rubble and bricks above which is a red layer, more

On Pls. 5 and 6 a rough rock niche is seen; it is similar to, and at the same level as 10 niches in the third area, see below.

#### The third area along the south rock wall

The third area runs from the mastaba of queen Khenut at position *C 2* on the plan to the south west corner of the dry moat, for a distance of about 140 metres.

In the report of 1942-1943, Z. Saad mentions that he had already excavated 30 metres of a new compartment west of the mastaba of Khenut 2 years earlier.<sup>18</sup> This excavation would be almost 90 metres west of the stairway of the great compartment in the second area and at position *C 1* on the plan.

During the season 1939-1940, on Pl. 7 we see the mastaba of queen Khenut in the background and

rubble and a second red layer on top. The red layers come from the desert crust, but the presence of bricks is curious.  
<sup>18</sup> Z. SAAD 1947, 65.

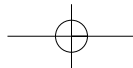




Plate 10

the new compartment in the foreground. The west rock wall extends beyond the east rock wall to disappear in the 'western filling'. Both the northern and eastern rock walls are short of the 'lower hard rock stratum'. No window-tunnel or stairway can be seen. The projection of the 'lower hard rock stratum' appears as a continuation of the one at the second area and suggests a destroyed rock roof covered the new compartment.

On Pl. 8 we are looking at the new compartment

from the opposite direction. We can see, much rubble north of the pyramid of Unas and the first pit of the galleries of king Hotepsekhemwy. From these photographs we learn that the excavation of the new compartment was not finished and the work was resumed 2 years later.

In season 1942–1943, Z. Saad reports that his intension '... was to clear the area to the northwest of the Pyramid of Unas in order to reach the end of this great trench (the new compartment)'.

According to our estimation Z. Saad started excavating 20 metres east of the corner of the dry moat.<sup>19</sup> He cleared 60 metres and discovered the tombs of Seshemnefer<sup>20</sup> and Princess Khentkawes.<sup>21</sup> In a search for the entrance of the latter's tomb, he uncovered '... a rough construction of local stone and mortar. It resembled the buildings ... under the temenos wall of the step pyramid' and it was about 14 metres long. On Pl. 9 one sees that it was built over the 'lower hard rock stratum' and preserves at least 5 courses. The bulk of it seems to be composed of 2 or 3 accretion layers along the south rock wall.<sup>22</sup>

East of this construction at the end of the 60 metres, Z. Saad found that the rock had been excavated to a depth of 26 metres and finally realised that here was the west end of the new compartment which he began clearing in 1939–1940. It measured 3 metres across. At the bottom he found a pavement of stone and mortar which he removed to reach the natural rock at a new depth of 27.5 metres. Then he proceeded to complete the clearance of the new compartment. We note from a sketch in the report (Z. SAAD 1947, fig. 7) that the floor was irregular and unfinished. According to our estimate, the length of the new compartment was about 60 metres.

In Z. Saad's report nothing was mentioned about the west end; Pl. 10 however, illustrates the south rock wall with the 'lower hard rock stratum' projecting. Similar to the east end the rock walls to the west and to the north stand short of the 'lower hard rock stratum'. Here the projection stretches to span the cavity above the west rock wall like a rock vault.

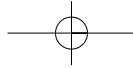
<sup>19</sup> This estimate is based on a study of photographs printed from negatives # 2143 and 2144 at Saqqara; (not published).

<sup>20</sup> Z. SAAD 1947, believes it dates to the fifth dynasty, and describes 'It was built partly with mud bricks and partly with limestone. This mastaba had been previously found and published by BARSANTI (*ASAE* 1, 150) and then reburied.'

<sup>21</sup> Z. SAAD 1947, reports that the owner was 'The elder daugh-

ter of the King, of his body, Khent Kaw-Es. We noted that the chapel and burial place of Khent-Kaw-Es were exactly in the line of the trench, and came to the conclusion that its end would be to the east of this mastaba.'

<sup>22</sup> On a photograph printed from negative # 2668 at Saqqara; (not published) the east end of the rough construction is in line with a point, 20 metres east of the northwest corner of the pyramid of Unas; in the background.



The cavity was blocked by modern masonry. On the same plate over the north rock wall is a small block of ancient masonry supporting another cavity.

The sketch mentioned in the report shows that a row of 'niches cut in the face of the southern rock wall of the trench from above the end of the trench towards the east. There are ten of these niches all similar with the exception of the ninth which is larger. Nine metres below these niches were found three similar ones. The first to the west is in one line with the ninth niche above it. The distances are equal.'

A print of negative 2791, not published, shows that the upper 10 niches were roughly cut in clay like layer in the limestone above the 'lower hard rock stratum'; similar to the one mentioned in the second area, the lower 3 niches would be below the rock roof. One also sees a sharply cut part of the 'lower hard rock stratum' above the east rock wall, as far as I can tell, it looks like the corner of an opening in the rock roof.

#### AN OVERVIEW (Figs. 1, 2)

The excavators of the inner south channel were unable to achieve a thorough clearance; because the idea of a great trench did not present itself and they were more concerned with other parts of their excavation. The plan shows that out of 410 metres along the south rock wall only 240 metres were excavated. They were unable to work at 4 areas measuring at least 170 metres in length: an unknown distance east of the eastern compartment, 60 metres in the 'eastern filling' between the excavations of S. Hassan and Z. Saad, 90 metres in the 'western filling' between the 2 excavations of Z. Saad and 20 metres before the corner of the dry moat.<sup>23</sup>

In the first area, mastabas at position *A-B 7-9* on the plan were constructed on a rock surface and on the 'eastern filling'. Thus the east ends and depths of the channel and the eastern compartment within are not known. At the second area by the north bank: the rock tombs at position *B 6* on the plan are cut in an unfinished part; to the south the work on the great compartment had made much progress. This situa-

tion makes it difficult to decide where the 'eastern filling' begins and where it ends. One could think, however, that the depth of the finished parts of the channel between the north and south banks in the two depressions is a few metres to the level of the 'lower hard rock stratum'.

The south rock wall at all the areas was topped by the 'upper hard rock stratum' while the north rock wall of the compartments was topped by the same stratum at the first area and by the 'lower hard rock stratum' at the second and third areas. The drop in level of this wall should be found in the 'eastern filling'.

The excavators brought 5 compartments to light, 2 of them: the middle compartment in the first area and the new compartment in the third area were probably cleared. The others were not: the east end of the eastern compartment, the west end of the western compartment in the first area and both ends of the great compartment in the second area were not reached. The compartments were about 3 metres wide. They revealed: 2 window-tunnels, a stairway, a possible opening in the roof, 14 niches, a pavement and layers of masonry.

In the first area, the floors of the eastern and the middle compartments are deep below the window-tunnels but the floors of the western compartment and the window-tunnel are level. In the second area, the bottom of the great compartment is 25 metres deep and a stairway descends to a lower level which is lost in the 'western filling'. In the third area the depth of the compartment reached a pavement at a depth of 26 metres and by its removal 27.5 metres. Thus we have 4 levels at the compartments discovered.

The 'upper hard rock stratum' was probably the rock roof of the compartments in the first area; while the 'lower hard rock stratum' was probably the rock roof of the compartments in the second and third areas.<sup>24</sup>

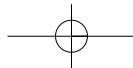
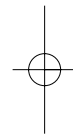
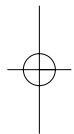
As far as I know there are no parallels to this extensive plan in the Old Kingdom. The depths excavated here are comparable to those beneath: the step pyramid, the southern tomb, Sekhemkhet, and Zawyet el Aryan south.<sup>25</sup>

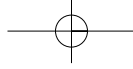
<sup>23</sup> Our estimate of the work of Z. Saad adds up to 200 metres only; it does not balance the figures he reports: 'the overall length of the trench from where we started in 1939 to the section to the east of the tomb of Seshem-nefer, is 235 metres' and our estimate of the work of S. HASSAN is 40 metres. Thus our total of 240 metres.

<sup>24</sup> We unfortunately do not know if parts of the destroyed

roofs were found in the course of the clearance to conform the subterranean nature of the compartments.

<sup>25</sup> This marks a sharp contrast with the subterranean galleries of the royal tombs of the 2<sup>nd</sup> dynasty, which are tunnelled below the 'upper hard rock stratum', or by digging shallow trenches and roofing them with limestone blocks; as seen at the galleries of king Hotepshemwy.





The step pyramid, subsidiary buildings, galleries and dry moat are unique for being oriented 6° east of north. Close by, the royal galleries of the 2<sup>nd</sup> dynasty are oriented north. Due to the difference in orientation, and without evidence, it is difficult to believe that the dry moat or parts of the step pyramid complex date to the 2<sup>nd</sup> dynasty.

So far we know a little about the archaeology of the dry moat. An explanation of the discoveries is premature and the religious significance is hitherto unknown. Nevertheless, the dry moat developed from

trenches surrounding earlier funerary monuments and physically separated the step pyramid complex from the royal tombs of the 2<sup>nd</sup> dynasty. It was, perhaps, meant to protect the complex from future intrusions. The absence of remains of the 3<sup>rd</sup> and the 4<sup>th</sup> dynasties are the best proof of that. Then kings Userkaf and Unas violated the taboo and the spaces between the dry moat and the temenos wall were invaded by subsequent dynasties. Notably within the temenos wall there were only a few intrusions although it became a source of building material for others.

