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٣٥ .....	جيهان زكي الصراع الكهنوتي في منطقة الشلال الأول في القرنين الثاني والثالث قبل الميلاد

For abbreviations, see: *Lexikon der Ägyptologie*, Bd. 7: Nachträge, Korrekturen und Indices, begr. v. Wolfgang HELCK u. Eberhard OTTO, hrsg. v. Wolfgang HELCK u. Wolfhart WESTENDORF. Wiesbaden: Harrassowitz Verlag, 1992; add. <http://aaew.bbaw.de/tla/servlet/S04?f=h016>.

# Reconstructions of the Layer Monument of *Snfrw* at Seila

Nabil Swelim

## Introduction

This contribution is presented to Professor Gaballa Aly Gaballa, a friend and a scholar who has held some of the highest posts of our beloved science on Ancient Egypt.

My subject presents one of the results of many years of research, which followed two excavation seasons I voluntarily conducted at the site of the layer monument of *Snfrw* at Seila for the Brigham Young University in 1986 and 1987.

My subject comes under the field or objective investigations of pyramid studies, which covers

- geology of the pyramid site,
- archaeology of the pyramid complex,
- architecture of the buildings of the complex.

The academic pyramid research however which is lightly dealt with here, is the subjective branch of pyramid studies which determines:

- Pyramids properties regarding geometry, stability and orientation.
- Terms for pyramid identity, subjects to research and objects to investigate.
- Pyramid concepts, which are monumental, historical and religious.<sup>1</sup>

This investigation deals with the ruins of a monument, which so far is not sepulchral, but is unique for having two chapels in which some rituals were performed. The ruins themselves were originally cased like five others at Hebenu, Abydos, Nubt, el Kula and Elephantine.<sup>2</sup> Hebenu is the only one, which preserves a few courses of the outer facing in situ. At Sinki and Elephantine the outer facing foundation has been discovered. Yet we cannot be sure of the ultimate shape of these layer monuments at present.

## Background knowledge

The suggested shapes of step, layer and benben monuments reconstructed so far, including this one of *Snfrw*, have followed various methods supported by archaeological material, logical calculations and hypothetical suggestions:

1 From my Abstract: *Pyramid Status. What is a Pyramid?* ICBP, Sarajevo, 2008.

2 To Seila and the 5 mentioned a 7th ruined uninvestigated monument at el Ghenimiya can be added.

1. The Step pyramid of Netjerykhet (Djoser?)<sup>3</sup> by Lauer.
2. The unfinished construction of Sekhemkhet<sup>4</sup> by Lauer.
3. The layer pyramid at Zawyet El Aryan south<sup>5</sup> by Lauer.
4. The brick pyramid at Abu Rawash<sup>6</sup> by Swelim.
5. The layer monument of *Sḥfrw* at Seila<sup>7</sup> by Lauer.
6. The pyramid of Meidum<sup>8</sup> by Borchardt.
7. The step pyramid of a Queen of Menkaura at Giza, G3b (no reconstruction).
8. The step pyramid of a Queen of Menkura at Giza, G3c (no reconstruction).
9. The benben in the sun temple of Userkaf<sup>9</sup> by Ricke.
10. The benben in the sun temple of Nyusera<sup>10</sup> by Borchardt.
11. The pyramid of Nefeirkara at Abu Sir<sup>11</sup> by Verner.
12. The layer monument of Hebenu<sup>12</sup> by Lauer.
13. The layer monument 'El Sinki'<sup>13</sup> by Dreyer.
14. The layer monument of Nubt<sup>14</sup> by Lauer.
15. The layer monument 'El Kula'<sup>15</sup> by Stienon.
16. The layer monument of El Ghenimiya (no reconstruction).
17. The layer monument of Elephantine<sup>16</sup> by Dreyer.

Fourteen of the seventeen cases mentioned above, present all the background knowledge we possess for the reconstruction of the seven layer monument at Seila, Hebenu, Abydos, Nubt, el Ghenimiya, el Kula and Elephantine. The methods followed in their reconstruction are discussed in their respective reports mentioned in the footnotes.<sup>17</sup>

- 3 LAUER, J-Ph., *Fouilles a Saqqara, La pyramide a degres l'architecture*, T II, Planches, Cairo 1936, pl. XIX, XX.
- 4 GONEIM, M. Z., *Excavations at Saqqara. Horus Sekhemkhet, The Unfinished Step Pyramid at Saqqara*, Cairo 1957, pl. IV.
- 5 LAUER, J-Ph., *Histoire monumentale des pyramides d'Égypte. Les Pyramides à Degrés (III<sup>e</sup> Dynastie)*, Cairo 1962, plans, 27.
- 6 SWELIM, N., *The Brick Pyramid at Abu Rawash, number "I" by Lepsius: A Preliminary Study*, Alexandria 1987, 70.
- 7 LAUER, J-Ph., *Histoire monumentale des pyramides*, Text, 224.
- 8 BORCHARDT, L., *Die Entstehung der Pyramide an der Baugeschichte der Pyramide bei Mejdum nachgewiesen*, Berlin 1928, plate 3.
- 9 RICKE, H., *Das Sonnenheiligtum des Königs Userkaf*, Bd. I, BABA 7, Kairo 1965, plans 1–3, 6.
- 10 BISSING, *Re-Heiligtum*, Bd. I, Bl. 1–4.
- 11 VERNER, M., Remarks on the pyramid of Neferirkare, *MDAIK* 47, 1991, 414, fig. 2.
- 12 LAUER, J-Ph., *Histoire monumentale des pyramides*, Text, 227.
- 13 DREYER, G., / SWELIM, N., Die kleine Stufenpyramide von Abydos-Süd (Sinki). Grabungsbericht, *MDAIK* 38, 1982, 83–95.
- 14 Ibid.
- 15 STIENON, J., El Kôlah, Mission de la Fondation Égyptologique Reine Élisabeth, *Cd'É* 1950, 1949, 42–45.
- 16 DREYER, G., et al, Stadt und Tempel von Elephantine VII, *MDAIK* 36, 1980, 276–280.
- 17 At Seila because of the earthquake of 1500 hours on October 12 1992, it is urgently necessary to protect the projecting blocks of layer 3, which backed the outer facing and secure the inner sides of the pit dug into the core by the robber's.

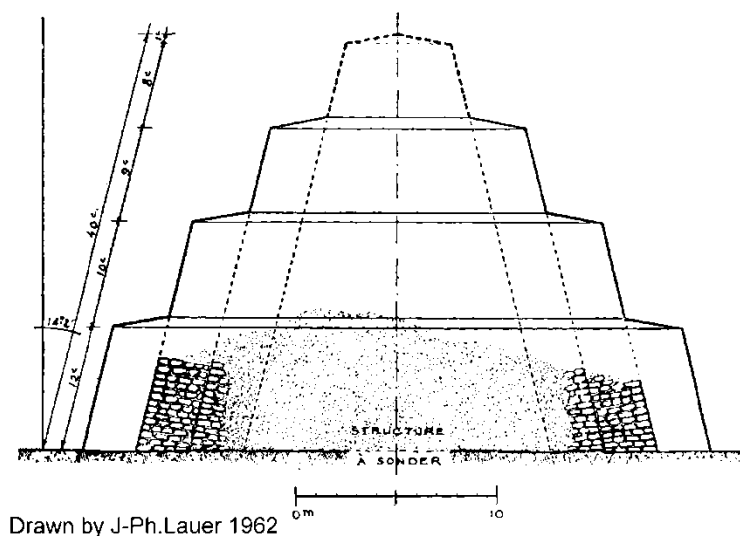


Fig. 1: Seila as reconstructed by J-Ph. Lauer, note how it is drawn on a level area

## Chapels

### The North Chapel

The north side of the monument was completely covered by a large mound of rubble. This mound was the result of the work of treasure hunters. We removed the central part of this mound and revealed the limit of the outer facing foundation, cut in the pliocene conglomerate followed by a level pavement and the remains of a brick wall at a distance of 4.40 meters. The conglomerate slopes westwards and was covered with an artificial filling on which the pavement extended. This pavement was topped with powdered limestone mixed with sand.

It seems that a chapel stood here because of fragments of a seated statue, probably of king *Snfrw*, a triple basin, outer facing: stone objects 'B', 'C', 'H' and a rough limestone table: stone object 'K'. In the filling at the North West corner, were outer facing chipping of good quality, early Old Kingdom chards, cloth, organic matter and broken bricks. The bricks may have belonged to markers like those at Sinki. North east of the monument, nine small pits filled with blown sand; when cleared, revealed nothing. They were strikingly similar to 12 pits west of the layer monument Sinki.<sup>18</sup>

### The East Chapel

At the east chapel two stele stood, one bearing the names of *Snfrw* and the other destroyed. Stone object 'F' (Fig. 9) probably the monolithic roofing block of a small shrine for a model boat, a wooden oar was also found (Fig. 10); stone object 'H' an outer facing header and 30 small fragments of fine stone were found. In the Late Period part of this area had been badly destroyed and two pits were dug at the original position of the stele.

18 DREYER, G., / SWELIM, N., in: *MDAIK* 38.

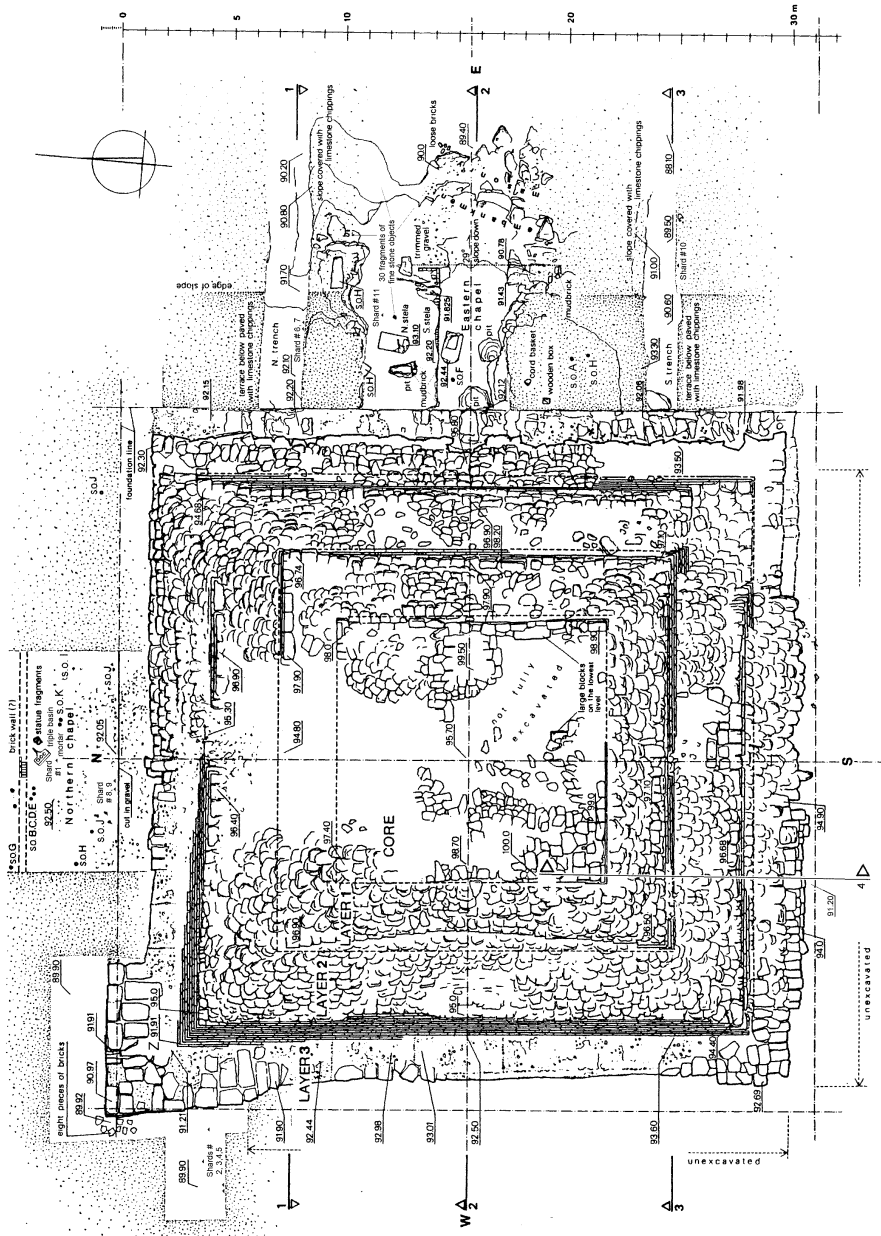


Fig. 2: aerial view of the layer monument of Seita

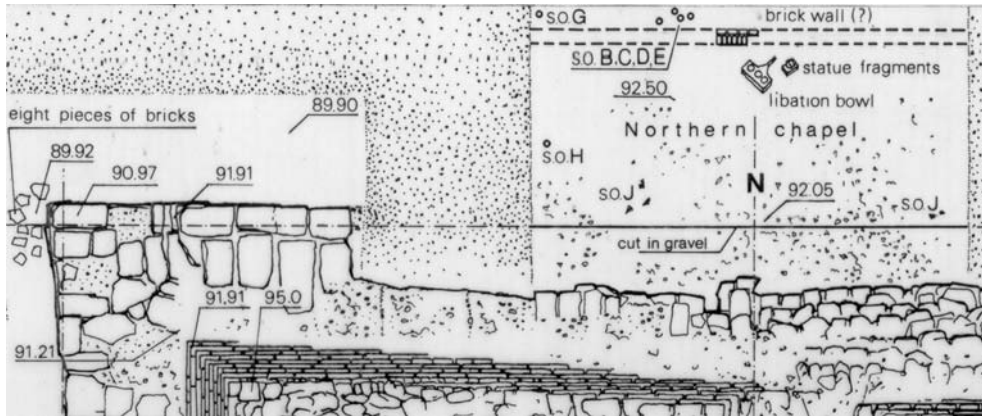


Fig. 3: the north Chapel and North West corner of the monument

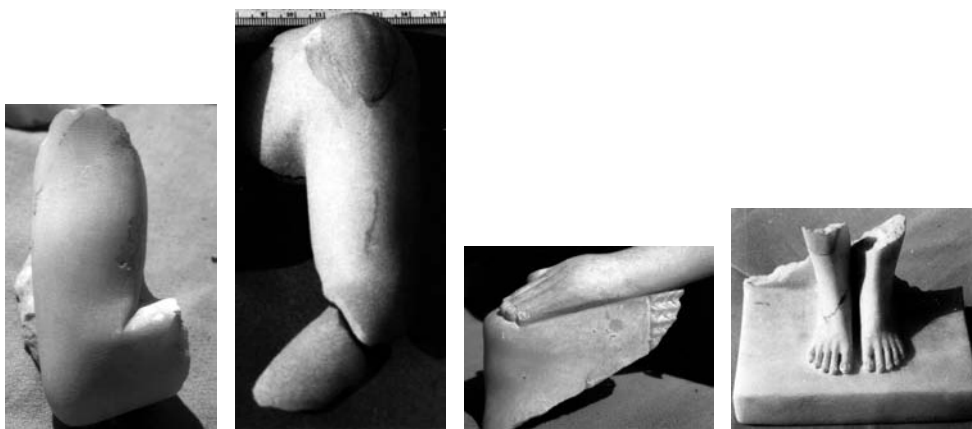


Fig. 4: fragments of a seated statue found in the north chapel

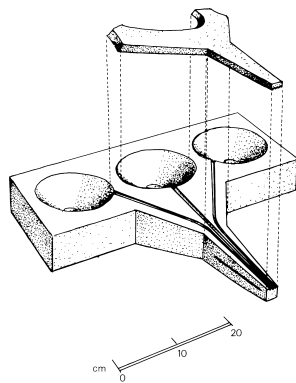


Fig. 5.1: a triple basin with canals and a cover

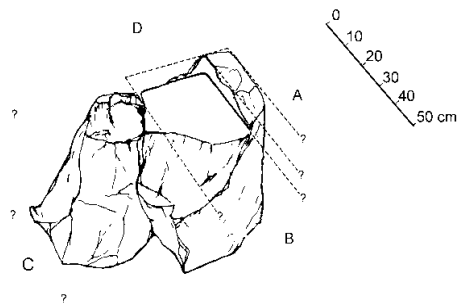


Fig. 5.2: stone object K, a fragments of a stone table found in the north chapel

The chapel extended approximately 12 cubits east of the layer monument' thus 3 cubits wider than the pavement. North and south beyond the embankment construction, the sides of the wadi were trimmed to agree with the slope. The remains of a brick wall were found by the trimming. Investigating the extent of the trimming two trenches tell us, that the Pliocene conglomerate was worked and covered with limestone chapping to agree with this angle for a distance of approximately 3 and 6 meters at the north and south sides of the wadi respectively. It is hard to tell at present how the sides of the embankment masonry and the conglomerate joined and what material was used for the final facing of the embankment and the possibility of a stairway. A preliminary examination of the embankment shows that the method of construction is similar to the revetment of the archaic temple of Hieraconpolis,<sup>19</sup> the fourth Dynasty dam at Wadi Garawi<sup>20</sup> and the revetment of the terrace of the sun temple of Nyusera.<sup>21</sup>

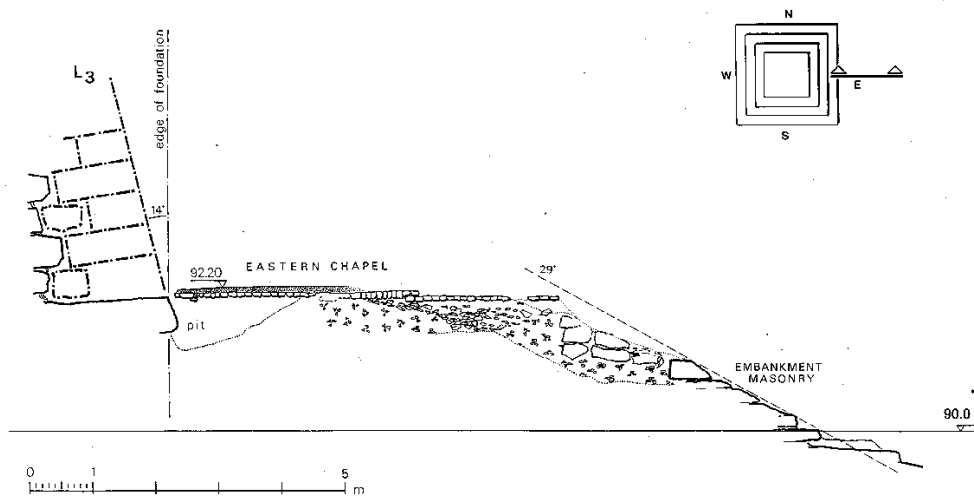


Fig. 6: east section of profile 2 showing the brick paving of the east chapel a and the stone embankment sloping down to the Nile-Fayum divide

## Reconstructions

### Outer Facing Masonry

During the field investigations many discoveries were made. We are interested at this moment in stone objects from the outer facing and for other uses in the building. Stone objects "H" are outer facing stones with the exposed side being polished. Two of these stone objects were found north and south of the eastern chapel (Fig. 7). The one found to the north was fitted as a header into the receding courses of layer 3, and the one found to the south of the chapel was fitted as a stretcher in front of the projecting courses of layer 3.

19 QUIBELL, *Hieraconpolis*, pt. I., pl. IV.

20 Leichtweiss-Institut für Wasserbau der Technischen Universität Braunschweig, Der Sadd el Kafara, Mitteilungen Heft 81/1983, Braunschweig 1983.

21 BISSING, *Re-Heiligtum*, Bd. I., Bl. 1-4



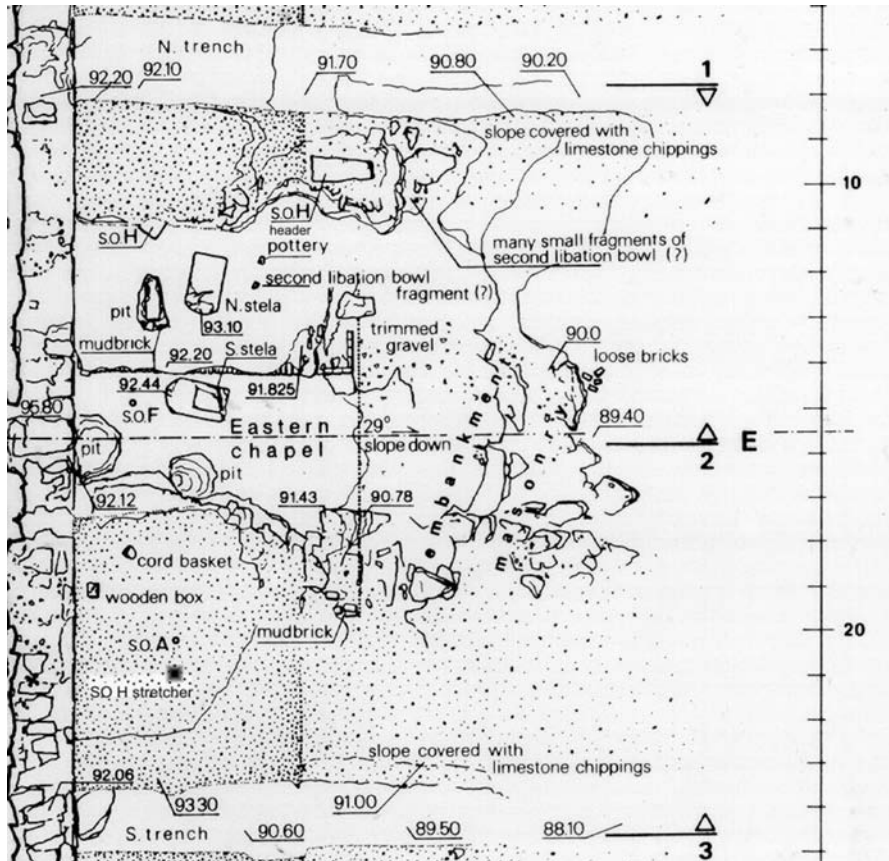


Fig. 7: the east chapel

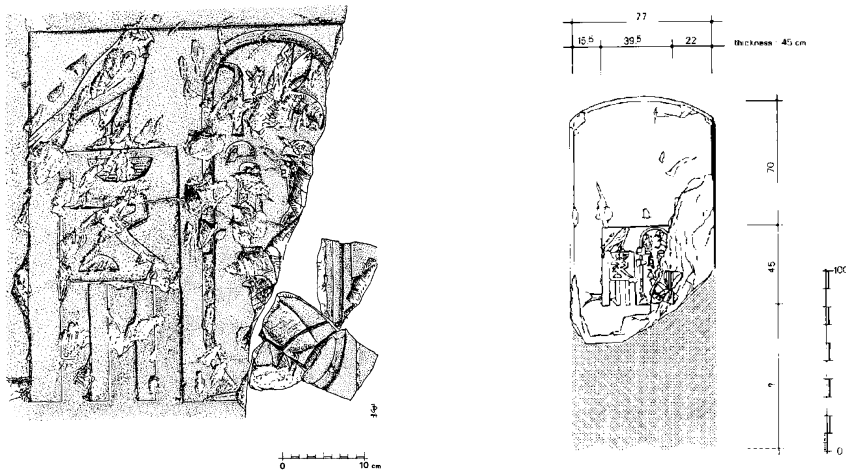
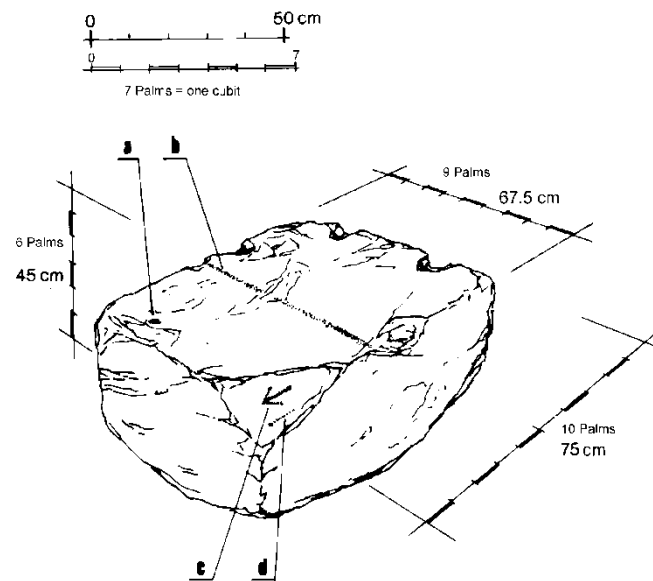


Fig. 8: the south stela found in the east chapel



*Fig. 9: stone object K, a block with remarkable dimensions, perhaps a monolithic roof of a shrine of a model boat*



*Fig. 10: a wooden oar (?) of the model boat*



*Fig. 11: stone objects from the outer facing*



*Fig. 12: layer 3 on the south side of the monument, the receding courses were the backing of the outer facing stone object H headers and the projecting courses were the backing blocks of the outer facing stone object H stretchers. Consequently the outer facing appeared smoothly when the project was complete*

The precise drawings made by George Homsey during my field investigations enabled me to acquire some basic information. And my academic research produced the final conclusions and drawings, which followed.<sup>22</sup> These enabled the preparation of this report. The essential data to reconstruct Seila are:

A drawing of the aerial view of the site

From the aerial view, Seila is built on unlevelled conglomerate formation. It has a base length of 31.1 meters. The drawing shows many other details, which are published elsewhere.<sup>23</sup> The position and directions of the profiles can be noted (see Fig. 2).

Drawings of the elevation

The elevations drawn by George Homsey show how the monument looks on the west side and the north side. Both elevations show the unevenness of the site on which the monument was built. This is a situation we need to realize before we start solving the reconstruction of the monument. Other layer monuments built on unlevelled rock foundations are at el Kula and Elephantine. The remaining four monuments at Hebenu, Abydos (Sinki), Nubt and el Ghenimiya are built on fairly levelled desert locations.

<sup>22</sup> The drawings with the appreciated help of Jaroslaw Dobrowolski.

<sup>23</sup> Seven layer monuments of the early Old Kingdom: SWELIM, N., An Aerial View of the Layer Monument of Snfrw at Seila, in: ENGEL, E. H. / MÜLLER, V. / HARTUNG, U., Zeichen aus dem Sand. Streiflichter aus Ägyptens Geschichte zu Ehren von Günter Dreyer (Menes 5), Wiesbaden 2008, 647–654.

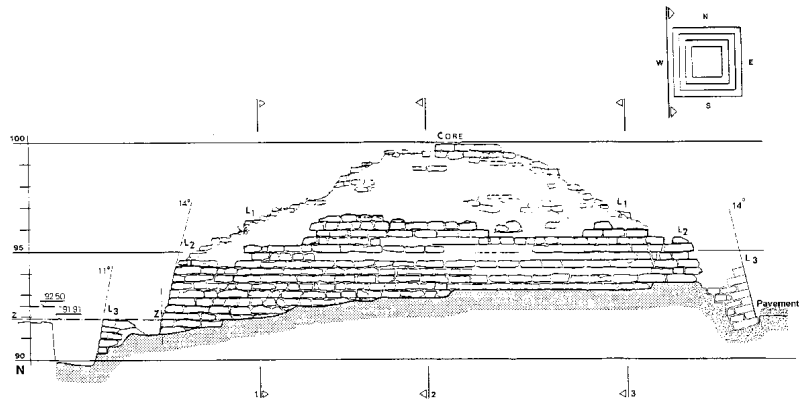


Fig. 13: elevation looking east, the arrows 1, 2 and 3 show the directions and sections of profiles 1, 2, and 3

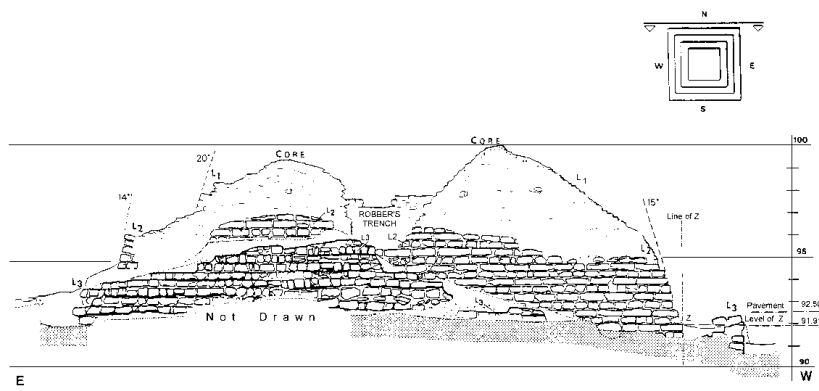


Fig. 14: elevation looking south, note the robbers trench

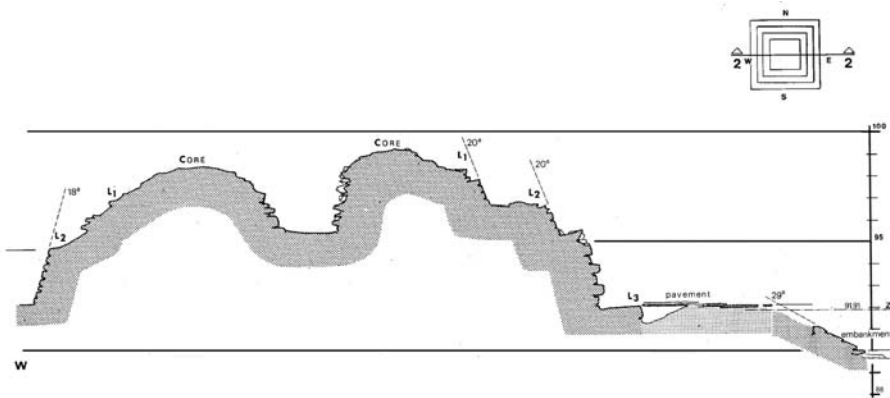


Fig. 15: profile 2

The datum line at the pavement level

The levels of the foundation of the outer facing and the pavement at the two chapels (Fig. 3, 7) have determined the ancient datum line and the pavement level for this reconstruction.

Profiles

On the aerial view (Fig. 2) and the west elevation (Fig. 13) there are profiles, three drawn in the seasons of 1988; the fourth is from the 1981 report. For our reconstruction we need profile 2 on the east-west axis (see Fig. 15).

Measurements of Angles

Most of the figures published here indicate the side angles of the layers. The following table shows their measurements. We see that the builders were not monitoring the slope of the layers sides as they were building. Thus we have side angles from 11° to 20°. This demanded corrections to be made to achieve a correct shape at the end.

Fig. <sup>24</sup>	Description	L2 N	L3 N	L2 S	L1 E	L2 E	L2 W
3	N. Elevation				20°	14°	15°
2	W. Elevation	14°	11°				
15	Profile 1					14°	14°
15	Profile 2				20°	20°	18°
15	Profile 3				14°	19.5°	14°
Kaiser-Dreyer <sup>25</sup>		12°–13° on the north side					
Kaiser-Dreyer		14° on the west side					
Kaiser-Dreyer		15° on the east side					
Kaiser-Dreyer		13.5°, 14°–15° at the outer and inner south side					

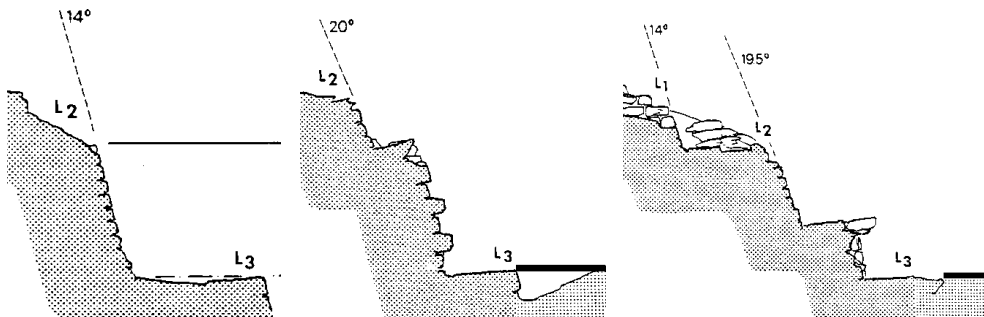


Fig. 16: different angles of slope of layer 2, as seen in profiles 1, 2 and 3, on the east side of the monument, this shows the irregularity of the outer faces of this layer and a need to correct it for the correctness of the ultimate shape of the monument

24 The figures in this report.

25 DREYER, G., / KAISER, W., Zu den kleinen Stufenpyramiden Ober-und Mittel'gyptens, *MDAIK* 36, 1980, 42.

### Other data

In addition to the base length we already know, the inaccessible thickness of layers and core at datum level need to be calculated. By comparison the original height would have been 17.8 meters.<sup>26</sup>

It remains that we have some problems:

- How did the builders correct the irregularities of the side angles?
- How can we reconstruct the shape of the step?
- How high could the steps rise above one another?
- What would the ultimate shape have looked like?

How did the builders correct the irregularities of the side angles?

Mistakes made by the builders of the layer monuments show that there were followed up by corrections, for example the steepness of the side angles of the core and layer 1, at Elephantine, were corrected by an increase in the width of layer 2 as it grows higher.

At the layer monument Sinki, the faulty plan of the core, layers 1 and 2 were corrected at layer 3 (foundation only exists). Its plan becomes fairly square and the corners correctly orientation.

I believe the outer facing at Seila had to be built at 14°, which is a seked of 7 or a simple ratio of an inclination of 1:4.

The sloping faces of the core and layers however show some variation from 20° to 11° consequently they do not maintain a flat plane. Stone object 'A' (Fig. 18) was probably used to correct the faulty side angle in the manner.

How can we reconstruct the shape of the step?

At the step pyramid of Saqqara the steps were sloping 20°–25° upwards. At phases E'1' and '2' of the pyramid of Meidum the steps were built level. Seila followed the first example, by evidence of an important fragment; stone object 'B' found near the north chapel (Fig. 3, 17).

The face of the 3<sup>rd</sup> layer would be dressed with the best quality limestone and rises to create the 1<sup>st</sup> step. The exposed part rising from the second layer in turn was dressed and so on. This will lead to the ultimate shape.

Stone object 'B' displays dressed surfaces and angles of basic importance to the slope of the step or steps of the layer monument.

Fig. 19 illustrates how I suggest the composition and the appearance of the step or steps at the layer monument of Seila would have been.

Stone object C in Fig. 17 presents a curious horizontal cut at one end and remains of mortar on the surface. I suggested that the inner corner of the cut was a point from which (Fig. 19):

- The horizontal width of the lower step was measured.
- And from which the vertical height of the next step began.

26 During dynasties III and IV pyramids had a height of less than 50% of the side or the diagonal of the base length; thus acquiring the stability created by the angle of repose. It seems that earlier builders had realised the advantages of the angle of repose by trial and error on religious and funerary mounds. The existing ruins of the other layer monuments, Hebenu, Sinki, Nubt, el Kula, el Ghenimiya and Elephantine have a base length of 22–25 meters and an estimated height somewhere between 11–12.5 meters. During the Fifth Dynasty, however, some queen's and subsidiary pyramids have a height equal to the base length.

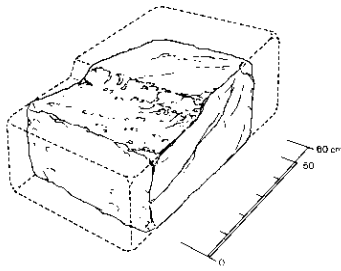


Fig. 17.1: stone object A

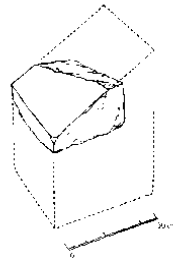


Fig. 17.2: stone object B

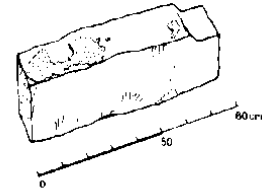
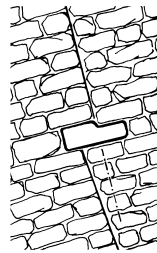
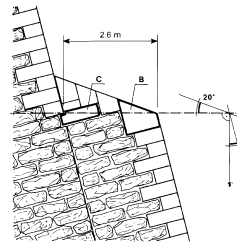


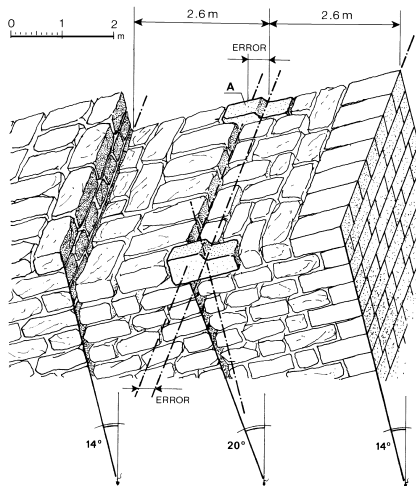
Fig. 17.3: stone object C



Use of stone object 'A' in section

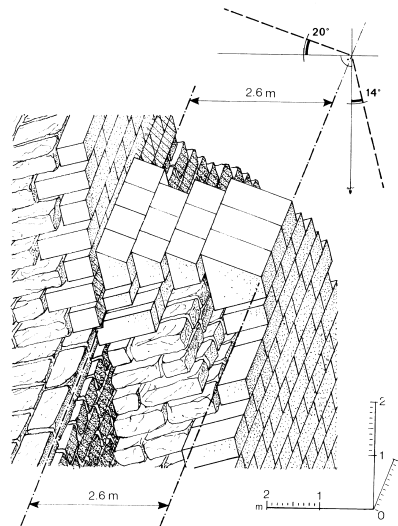


Use of stone objects 'B' and 'C' in section



Use of stone object 'A' in perspective

Fig. 18: a suggested insertion to readjust a fault in the slope of the of a layer



Use of stone objects 'B' and 'C' in perspective

Fig. 19: a section and a axonometric suggestion of how stone objects B, C and how stone objects H (headers and stretchers) were set. The latter were built with fine gypsum still seen on the backing course

In the two options for reconstruction the layer monument in Fig. 22 and 23 stone objects 'C' is built in L2. The position however is different because:

- In the step pyramid option it measures the width of the second step and the height of the third step.
- In the benben option it measures the width of the first step and the height of the shaft of the obelisk.

How high could the steps rise above one another?

Examining the step pyramid of Netjerykhet we are faced with an unusual situation having a rectangular base.

For the ultimate P1 we have a base length of: 233 x 208 cubits; 122.09 x 108.99 meters and a height of: 109.50 cubits; 57.38 meters.

For the earlier P2 a base length of: 163 x 147 cubits; 85.41 x 77.02 meters and a height of: 75.89 cubits 39.77 meters.

One observes a general tendency towards a decrease in the height of the upper steps and an equation the sloping of the top of one step with the rise of the step above it.

What would the ultimate shape have looked like?

The available data leaves us faced with a situation where all the ruins of layer monuments can lend themselves to a variety of shapes recorded on contemporary graffiti, hieroglyphs and benben determinative. Some of which are selected in the following table.

While information on the ultimate shape,<sup>27</sup> the number of steps and the original height are missing, the shapes in Fig. 20 and 21 can only furnish a general idea.

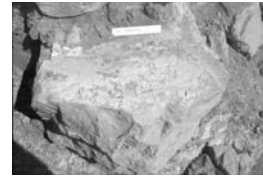
#### The step pyramid option

Since the ruins of the layer monument of Seila are composed of a core and three layers it is tempting to suggest a step pyramid with four steps. We will consider a core which would rise to create the uppermost step, the outermost, layer 3, would be the lowermost step and layers 1 and 2 in-between would be the 3<sup>rd</sup> and 2<sup>nd</sup> steps. Fig. 22 gives this suggested reconstruction, which I have worked over profile 2 of Fig. 15.

In Fig. 14 there are three profiles: profile 1, where the face of layer 1 is 14° and the face of layer 2 is 19.5°; profile 2, where the face of layer 2 is 20°; and on profile 3 the face of layer 2 is 14°. These irregularities of the face of layer 2 show the need for the rectification I suggested in Fig. 18.

The height calculated for my suggested reconstruction is 34 cubits (17.8 meters), the uppermost 2 cubits created the summit.<sup>28</sup> Each of the four steps below this summit has a vertical height of 8 cubits.

My suggested reconstruction fulfils the equation of the lengths of the slope at the top of one step with the slope of the rising step above. This length is a little less than 6 cubits (actually 5 cu, 6 pm).

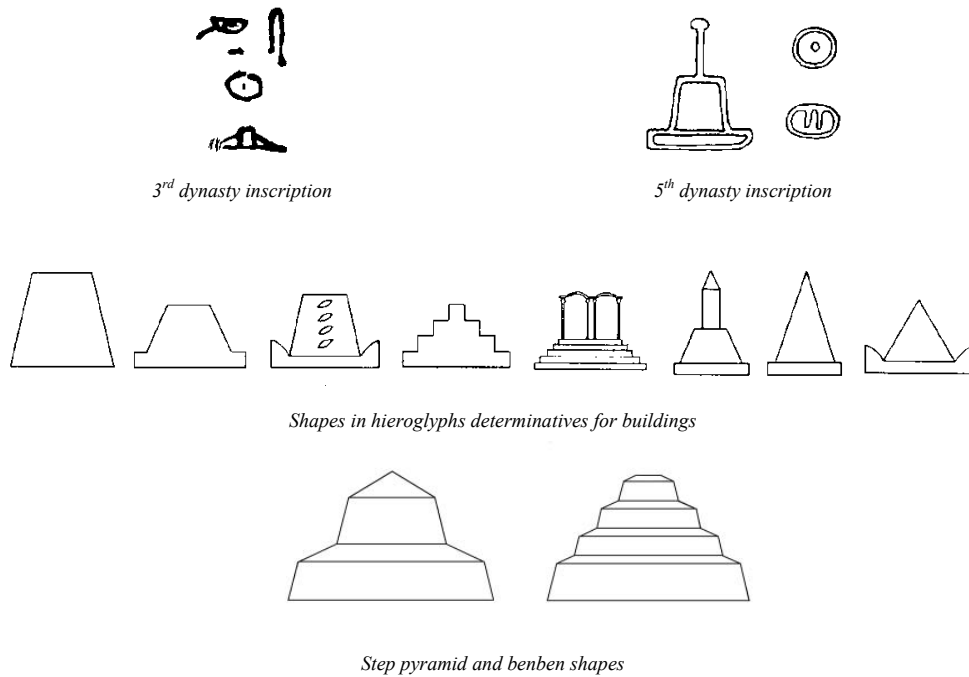


*Fig. 20: Fine gypsum on the projecting course to which the outer facing headers were fixed. The gypsum mortar is of the same type as in stone object 'C'*

27 An incision however on a limestone chip, shows a true pyramid with the angle of the Red pyramid of Dahshur.

28 Such a summit could be the forerunner of the pyramidion.





*Fig. 21: shapes that could be the ultimate shape of the layer monuments*

The effect of the decrease of the height of steps with height of the monument is a result of two factors:

- The lower step appears taller than the second, third and fourth because it rises from the pavement and is not partly obscured by a slope of a step below.
- The resulting slope of the summit above the 4th step measures approximately 5 cubits and rises for 2 cubits. These measurements are smaller than the steps below by 2 palms in the height and a cubit in the length of the slope.

#### The benben option

The layer monument of Seila can be reconstructed as a benben. I have worked it over profile 2 also. It has slightly higher summit than the step pyramid option (Fig. 23).

In this case there are three options:

1. The obelisk may have included the core, and the lower step as a result would be layers 1, 2 and 3.
2. The obelisk may have included core, layers 1 and 2, and the lower step as a result would be layer 1 only.
3. The obelisk may have included the core and layer 1, and the lower step as a result would be layers 1 and 2, which is preferred here.

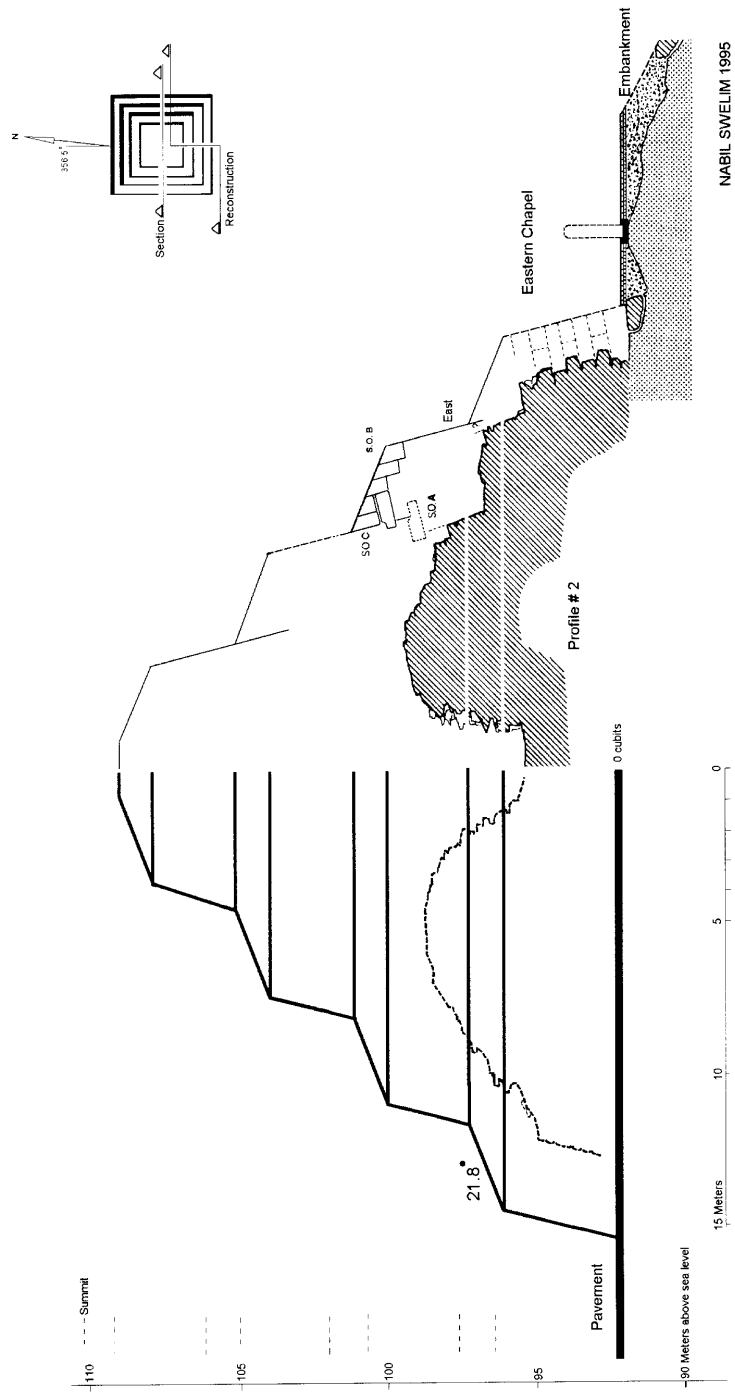


Fig. 22: section of the reconstruction of Seila, step pyramid option

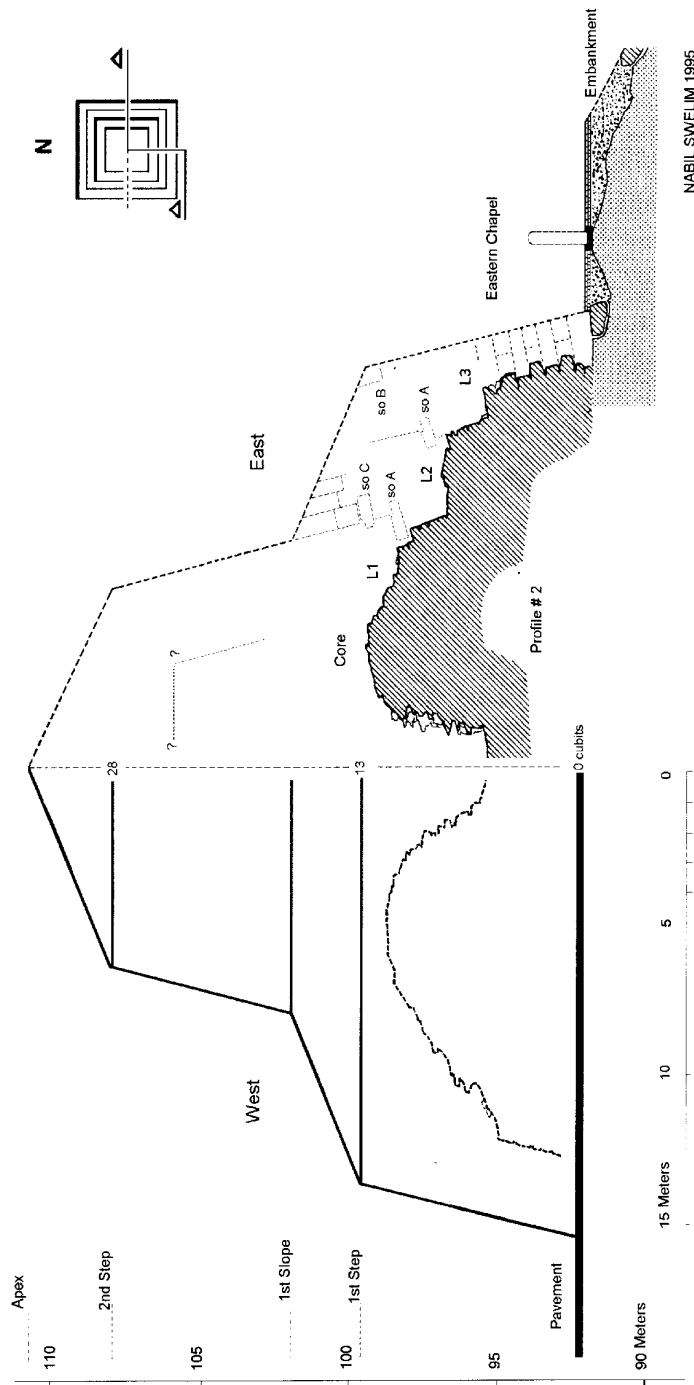


Fig. 23: a section of the reconstruction of Seila, benben option

- The casing of the first step is on layer 3.
- The casing of the shaft is fixed to the upper part of layer 1.
- The core is completely embedded.
- The apex of the benben is built on a common platform.

In both options the nucleus would be rectified or contained within the outer facing. The layers were 5 cubits wide with side angles of  $14^\circ$  off the vertical.

A pavement surrounds the monument at the top level of the foundation of layer 3 with a width of 4.4 meters.

The final monument of the step pyramid option would have:

- A base length of = 30 metres.
- A height of = 21 metres.
- A side angle of = Seked 7, ( $76^\circ$ )
- An axis bearing  $356.5^\circ$
- Google Earth coordinates: "
 

$29^\circ$	22/	57.17//	N
$31^\circ$	03/	13.27//	E

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