

## THE LAYER MONUMENTS

Six layer monuments namely Hebenu, Sinki, Nubt, el Kula, el Ghenimiya and Elephantine (see entries) were built by a king or kings unknown to us and serve a purpose which is hitherto unclear. The investigations concerning them are incomplete, but some light however has been cast: they are almost of the same construction, dimensions, and seem to date to the 3rd dynasty; they have no substructures nor temples and are not within a cemetery of that period. To the 6 layer monuments some monuments could be added or related:

Two pairs of tumuli at Naqada, investigated by Petrie.

A square structure of rough masonry truly oriented to the cardinal points, of a side measurement of 11 m, suggest that it was a core of an unfinished or destroyed layer monument. It was excavated under the Middle Kingdom chapel of Ay at Abydos by C.T. Currelly.

A benben named Seketra, and perhaps a pyramid named Nefer, recorded in ink on stone vessels discovered under the step pyramid at Saqqara.

The pyramid of Snofru at Seila (see entry).

Two step pyramids of queens of Menkaura at Giza (# G3b and G3c), differ in structure and function.

Two benbens dating to the 5th dynasty in the sun temples of Userkaf at Abu Sir and Neusera at Abu Ghurab.

Four 5th dynasty benbens of other kings known from texts.

With the exception of Ghenimiya which has never been excavated the other 5 layer monuments and Seila have only been partly investigated. The nuclei of Hebenu, Sinki and Nubt were built of quarried limestone and selected concretions from the slopes of the nearby plateau, Seila and el Kula were built of quarried limestone, el Ghenimiya was built of quarried sandstone and Elephantine was built of quarried granite and selected bolder. In all cases clay or prehistoric lake sediment mortar was used in large quantities to build their nuclei. The nuclei of Seila, Hebenu, Sinki, el Kula, el Ghenimiya and Elephantine were composed of a core and 2 accretion layers, Nubt was composed of a core and 3 layers. They were built in courses of masonry set in beds inclined backwards.

Outer facings existed at Seila and Hebenu, evidence at Sinki, el Kula and Elephantine but unknown at Nubt and el Ghenimiya. At Seila the dressed limestone of the outer facing was bound by a hard white gypsum mortar. Its foundation was built over steps dug in the gravel to reach an all round level for the pyramid base. At Hebenu and Sinki, the monument was built in a shallow levelled pit, 2 courses of masonry were built around the nucleus as a foundation for the outer facing; Sinki was left unfinished. The method of fixing the outer facing at el Kula, unlike Hebenu, Sinki, Nubt and el Ghenimiya had to be founded on the bed limestone rock. At Elephantine which was built on the bed granite rock, both the outer facing and the nucleus were built over a common platform, none of the facing blocks have survived. At el Kula the common platform does not exist, but a levelling foundation around the nucleus could have been the solution. Around Nubt and el Ghenimiya no clearance has been made but one could assume that they would be similar to Hebenu and Sinki. While Seila, Hebenu, el Kula and probably Nubt were cased with limestone and Sinki was to be cased in that material, there remains

a question concerning the material used at el Ghenimiya and Elephantine. Could it have been sandstone and granite?

The existing ruins of Seila and the 6 layer monuments, Hebenu, Sinki, Nubt, el Kula, el Ghenimiya and Elephantine are truncated layer constructions which have a base length of 31 m at Seila and 22.5-25 m at the 6 minor step pyramids. Thus their original height, judging by all pyramids of the 3rd and 4th dynasties, should have been somewhere between 15-21m (=28-40 cubits) for Seila and 11 and 17m (=21-32 cubits) for the 6 minor step pyramids. Pyramids during these 2 dynasties and pyramids of a base length longer than 25 m (= 50 cubits) during the later dynasties have a height which was always less than 50% of the base or the diagonal length; thus acquiring the stability created by the angle of repose. Earlier builders were sure to have comprehended the advantages of the angle of repose by trial and error on religious and funerary tumuli. Within the estimated height the present ruins could lend themselves to a variety of shapes seen in contemporary graffiti, hieroglyphs and determinatives of benbens; the step pyramid form is indeed one of the possibilities.

Hebenu and Elephantine, are not located at the edge of the western desert where pyramids are usually located, the former is very close to the Nile on the east bank, the latter in on the island. One cannot see any relationship between the 6 minor step pyramids and the river, none of them, contrary to what is commonly thought, is oriented parallel to its course. Sinki and el Kula are oriented to the cardinal points by their corners. Hebenu, Sinki and el Kula are at locations where the channel narrows while the others are at locations where the river has a normal width.

While the excavation of the Seila pyramid has shown that it was connected in some way with a cult, perhaps a funerary one of king Snofru, outstanding problems created by the 6 minor step pyramids remain unsolved. These problems concern their ownership and the purpose for which they were built.

Kaiser and Dreyer believe that they were symbols of royal power in the estates of king Huni of the 3rd dynasty. The connection with king Huni was based on the famous granite cone (Cairo, J.d'E 41556) bearing his name on the site of the Elephantine pyramid. We cannot be sure of this connection nor do we know of any parallels of such an inscription with the other pyramids, the possibility however cannot be ruled out. One needs to mention that a seal impression of Horus Sanakht were found in the vicinity. The archaeological site at the Elephantine island was limited and many activities have occurred over the ages in that area. The 3rd dynasty stratum on 3 sides of the pyramid have not yet been excavated, consequently the ownership and function of that pyramid may come to light after these areas have been studied. The situation at the other 5 pyramids where the space was unlimited has not supported this hypothesis either.

The picture during the 1st 4 dynasties shows that initially the god Horus played the important role, Seth was raised to a high position after the fall of the 1st dynasty and subsequently Ra was promoted to the highest position. Following the course of the evergrowing importance of the Heliopolitan sun god Ra we can see that he eclipsed Horus and Seth by the start of the 3rd dynasty. This could be traced back to Horus Ranef and in a connection between Ra and Seth during the reign of Peribsen during the 2nd dynasty. This king seems to have rejected Horus and replaced him with Seth. This religious unrest may have boosted the supremacy of the sun god. In the mean time the

pacification of Horus and Seth was attempted twice during the 2nd dynasty, once before Raneb and Peribsen, during the reign of Hetepsekhemwy and once after during the reign of Khasekhemwy.

In the nome of the god Seth, some evidence of this pacification may be seen S and SW of the pyramid of Nubt. Two pairs of stone tumuli containing nothing within or beneath them are on lines bearing NS. Each of these pairs of tumuli could represent the mounds of Horus and Seth, mentioned in the pyramid texts. Since a process in favor of Heliopolis and the prominence of the great sun god Ra was already underway, one could assume that other forms of mounds or benbens were being erected throughout the united country. Indeed, an ink inscription on a stone vessel fragment from the step pyramid mentions a benben named Seketra.

Supporting the Heliopolitan supremacy during the 3rd dynasty we observe that Horus Netjerykhet named himself Ranub, and employed Imhotep who was a Heliopolitan high priest. Netjerykhet had the superstructure of his tomb (the initial mastaba at his complex at Saqqara) converted into a primeval hill with Heliopolitan affinities (the step pyramid). H. Frankfort calls this hill "the fountain head of emerging life" and describes the step pyramid as "a three dimensional form of the hieroglyph for hill". He adds that "the concept of the primeval hill was thus able to account for both the step pyramid and the true pyramid". Pyramid tombs have been explained as "the place where the nether and upper worlds communicated", by the term upper world A. Painkoff means "the solar mountain, the benben, the obelisk point dedicated to the sun" and "the primeval hill which first arose from the flood at the creation of the world and which was the first manifestation of Atum, the all".

If the nether world factor is absent in a pyramid, it tends to become not a tomb but a benben. The 6 layer monument which lack a substructure may very well be of that nature and would be predecessors of 5th dynasty benbens in sun temples and, the better known, monolithic obelisks. If that were the case they would become the prototypes of all pyramid tombs. Consequently, in my opinion, the 6 minor step pyramids could be classified as Archaic Benbens dating to late 2nd dynasty or early 3rd dynasty.

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## **THE LAYER MONUMENT OF SEILA**

Known name: Pyramid of Seila

Arabic name: El Qalcah Pyramid of Seila or Fag el Gamous.

G-R name of the site (south of Philadelphia in Crocodilopolis)

### ***Geographical information of the site:***

The location of the monument is on the Map of Egypt (1: 25 000) EL RODA sheet 74/615 of 1971 and recorded on the map (1: 100 000) BANI SWEIF sheet 29,00/31,00 of 1956, its coordinates on the UTM kilometre grid are 741.5 N, 620 E, (= 29° 33' N, 31° 03' E). Nine kms SW of the ruins of Philadelphia. Overlooking the Nile-Fayum-Divide to the east and the Fayum depression to the west. At a distance of 2 km and a rise of 100 m east of a bridge Hagz Nagib crossing the Wahby canal. The access to the site is by a wadi passing close to the pyramid's north side, ascending from the Fayum cultivation over the sediments of the prehistoric lake of Fayum to a limestone raised formation above which are layers of hard gravel. The pyramid is built on the second highest point of these layers where five wadies begin their course in all directions downwards. The relative position to the pyramid of Meidum, which is at a distance of 10.5 km, is a little south of the east west axis. At the Seila pyramid site, on clear days, one sees an oblique view of the south side of the pyramid of Meidum and the Nile Valley beyond it.

### ***History of exploration, dates***

The first reference to this pyramid was on a sketch map in Petrie's *Illahun* publication of 1891 where he mentions a mastaba. L.Borchardt, A.Pochan, J.Ph.Lauer, W.Kaiser and G.Dreyer, N.Swelim and L.Lesko published short articles between 1900-1988. The only excavations were carried out by Lesko in 1981 followed by Swelim in 1987 and 1988. Some one unknown, however, had excavated the western side of the pyramid before Borchardt made his investigating visit of 1898, this was a major task which would have taken one month's work with a team of 50 men. Some speculations pointed to Petrie, I realize that he would have never called it a mastaba had he had known that it had a square base and that with his experience and knowledge he would have cleared the east or north side but never the west side. Nevertheless in 1988, I cleared this matter with Margaret Drower who is most familiar with the great archaeologist's unpublished work and got to know that he did not dig at the pyramid site. Perhaps, as the case was with the layer monument of el Kula, some scholars made investigations, without publishing a report. It could be Mariette, but that is a mere guess. In 1951 Ahmed Fakhri considered investigating this pyramid, but declined for a greater project at the Bent pyramid. Leonard Lesko working at U.C.Berkly with Brigham Young University conducted a short season at the pyramid in 1981 and published his report in 1988. Wilfred Griggs of BYU working at the early christian cemetery of Fag el Gamous during the seasons 1987 and 1988 invited Nabil Swelim to excavate the pyramid for that university. During these seasons Swelim discovered that the monument was built by king Snofru. The work is still to be continued.

### ***Body of the subject***

The pyramid stands today with much of the rubble removed from the north and east sides. The first of the 5 wadies, which start at the pyramid site, (NE) has been cleaned from the fallen blocks and rubble, the second (E) is still under investigation, the

third (NW) was used for storage of the fallen masonry and the remaining 2 (S and SW) were used as dumps.

The NS axis of the pyramid is oriented  $348^{\circ}$ . The monument stands to a height of 30 courses of masonry from the lowest course discovered in 1987 and 8 m above the base. It was built on an unlevelled area on the natural hard gravel which had been worked into descending steps to the north and west, some of the steps were short and masonry was added to complete a 5 cubit width for the accretion layers.

The nucleus (a core and 2 accretion layers) and outer facing (one accretion layer) were built directly on these foundation steps in courses inclined backwards. The nucleus blocks were quarried from projections of thin beds in the western limestone formation below the gravel. A method of drilling holes of 10 cm in diameter through the bed and disengaging the block by means of a heavy impact was utilised.

The base length of the pyramid is 31 m (= 59 cubits) since 2 accretion layers of nucleus and a layer of outer facing almost uniformly measure 2.5 m (= 5 cubits), we may assume that base of the core measures 16 m (= 30 cubits) at the same level. This length has not been actually measured. A great robbers trench cut from the north side of the pyramid goes to the center causing a dangerous threat to the safety of the monument. In the preliminary cleaning of this destruction, comparatively large blocks of masonry were found at a lower level of the core. If the danger is secured an investigation of this area should be made because no substructure had been hitherto reached.

The outer facing was not found in situ but many dressed blocks indicated that the side angle was created by a horizontal displacement of 7 to a vertical drop of 28 (saked  $7 = 14^{\circ}$ ). One fragment indicated that the step or steps of the pyramid were not level as the case is with the pyramid of Meidum (phase E1 and E2), but sloped  $12^{\circ}$  upwards from the horizontal, as the case is at Saqqara. The outer facing blocks were built in headers and stretchers, and have all been removed leaving the backing blocks in alternative courses projecting out in headers or receding in stretchers. The important observation here is concerned with the difference in mortar; the nucleus and backing blocks of the outer facing are set with mortar containing the prehistoric lake sediment, the outer facing uses a fine white gypsum seen on the backing blocks where they were in contact with the absent outer facing.

It seems that the upper part of the monument was stripped of its outer facing at a very early date, perhaps towards the end of the Old Kingdom, consequently the exposed upper nucleus began to erode over a very long period of time resulting in flakes accumulating around the base of the monument to a height of 1.5 m, they were surprisingly undisturbed during this long period. One object found in these flakes dates to the Middle Kingdom.

The destruction which followed shows that the lower blocks of the outer facing (not the backing blocks) were removed after the buildup of the flakes. The excavation showed that the flakes preserved a "molding negative image" of the pyramid sides. A later phase of destruction occurred in the Ptolemaic times as pottery and a coin show. The upper nucleus was destroyed, filling in the space where the outer facing blocks were once built between the flakes and the backing blocks and covering the parts of the nucleus which survive today.

The excavations of 1987 and 1988 revealed evidence of brick work belonging to two chapels on the north and east sides; the extent of these chapels is yet to be determined. The pavement of the chapels was the pyramid base level. The northern chapel was built over leveled gravel. The eastern chapel was built on an artificial terrace which went beyond the gravel stepping which rapidly declined as the eastern wadi. This artificial terrace was constructed by means of limestone embankments and a filling of rubble which presumably began at the lowest level of the wadi; hitherto only the upper parts have been cleared. This method of construction is seen at the 4th Dynasty dam at Wadi Garawi. The pavement was generally a layer of brick stretchers and on edge. The slope of the limestone embankment is caused by a horizontal displacement of one to a vertical drop of one (seked 28 =  $45^{\circ}$ ).

The major finds on this artificial terrace were 2 steli, the northern was badly damaged but the southern preserved the name of the owner of the pyramid in a serekh of Horus Nebmaat and the cartouche of Nebty, Neswbity Snofru. Many alabaster fragments which were found in the rubble, could reconstruct a libation basin. Such a basin with a lid was found in a good state of preservation in the northern chapel together with several fragment of a magnificent small seated statue of the king.

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## THE LAYER MONUMENT OF HEBENU

Known name: Pyramid of Zawyet el Maiyitin (or el Amwat) or Hebenu.

Arabic name: Zawyet Sultan.

G-R name of the site (The 16th nome Hieraconpolis)

### ***Geographical information of the site:***

This monument is recorded as a small pyramid on the map of Egypt (1:100 000) EL MINYA sheet 150, of 1956 and (1:25 000) EL MINYA portions of sheets 59/585 and 59/600 of 1953; its coordinates on the UTM Kilometre grid are 593.3 N, 598 E (28° 03' N, 30° 50' E). The site can be identified from long distances because of a conspicuous ruined tower built over the highest point of the eastern mountain. To the north of it is the vast modern cemetery of Zawyet Sultan Pasha, characterized by hundreds of small domed buildings, to the east is a vast archaeological site with Predynastic, Old, Middle and New Kingdom tombs, and the massive ruins of Hebenu. The mausoleum of Sidi Sharaf is to the east beyond the ruins of Hebenu and the mausoleum of Sidi Yaseen is on the river bank. To the NW and passing to the SE is a paved road; the river bank is beyond this road at a distance of 200 m. At this point the channel narrows in a similar manner to the sites of the minor step pyramids of el Kula and Sinki. The course of the river is NW (= 315°) for 8 km till the city of Menya.

### ***History of exploration, dates:***

This pyramid was first investigated by R. Weill in 1911, in search of a burial chamber he forced a trench destroying the nucleus of the pyramid along the NS axis, but found nothing. His short report did not provide a plan and section. In 1962 J.Ph. Lauer investigated it and indicated its similarity to the minor step pyramids of el Kula and Nubt; he made a sketch of a section combining the architectural composition of this monument to the left and of the one of Nubt to the right. In 1963 Maragioglio and Renaldi drew an elevation using a photograph published earlier by Lauer in 1960; they added a drawing of the accretion layer arrangement. An account of this monument was published by Werner Kaiser and Gunter Dreyer in 1979.

### ***Body of the subject***

The appearance of this layer monument is unique, one sees rough masonry projecting out of fine stone work surrounds it. The pyramid is oriented by the NS axis 340°, thus deviated 25° east of the river course; an interesting bearing midway between the magnetic north and the Nile at that point. The architectural composition is made up of a nucleus (a core and 2 accretion layers) and an outer facing (one accretion layer). The ruins of the nucleus stand to a height of 4.75 m, and the outer facing to a height of 1.7 m; the base length of the pyramid is 22,5 m (= 43 cubits).

The nucleus measures approximately 18.3 m (= 35 cubits) at the foundation, an estimate of the square core is approximately 10 m (= 19 cubits) and the 2 accretion layers have a thickness of approximately 2 m (4 cubits). The building material is roughly shaped limestone and unshaped concretions arranged in courses 0.25-0.30 m high in average but they become smaller at some points. The concept of brick headers and stretchers seems to have been intended by the builders and reminds us of the stone work at the step pyramid of Saqqara, the layer pyramid at Zawyet el Aryan and the pyramid of Seila. The masonry is set in a mud, sand and crushed limestone mortar. The beds are



inclined backwards creating a horizontal displacement of 5 to a vertical drop of 28 in average (seked 5 =  $10^\circ$  ).

The outer facing is an accretion layer, the total thickness being built of fine carefully cut and polished limestone of the same average thickness of 2 m (= 4 cubits) the actual measurements of the layer varies between 1.9 and 2.3 m. The outer facing is built on a foundation platform of rough masonry, very similar to the one we discovered at Sinki and the slightly different from the one at Elephantine.

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## THE LAYER MONUMENT OF NUBT

Known name: Pyramid of: Nubt, Naqada or el Zawayida.

Arabic name: Gorn el Shair (The barn of barely)

G-R name of the site (Typhonia, opposite the 5th nome of Coptos)

### ***Geographical information of the site:***

This monument is recorded by its local name Gorn el Shair on the map of Egypt (1:100 000) QENA portions of sheets 36/72 and 36/78 of 1934; and on the map Egypt (1:25 000) QIFT portions of sheets 36/780 and 36/795 of 1954; its coordinates on the UTM kilometre grid are, 365.2 N, 788.3E (= 25° 58' N, 32° 44' E). It is located 200 west of the cultivation of Ezbet Ibrahim Qaraqir at Hod (basin of) el Zawayida el Gharbi (the western). The course of the Nile in this area between, south of Naqada and el Zawayida is 35° for 11 km.

### ***History of exploration, dates:***

The pyramid of Nubt was partly excavated and recorded by Petrie in 1896, the clearance was concentrated within the nucleus and nothing seems to indicate that the rubble around it was removed. J. Ph. Lauer saw the similarity of its nucleus with that of the layer monument of Hebenu and made a reconstruction sketch combining half of each monument in one pyramid in 1962. Maragioglio and Renaldi considered it in their great work. Kaiser and Dreyer visited and published their observations on it in 1979.

### ***Body of the subject:***

The layer monument of Nubt breaks the monotony of the desert plain at this site. It is an accretion layer monument built with very rough limestone blocks and selected concretions set with a clay and sand mortar, in courses 0.4-0.3 m. The beds are inclined backwards creating a horizontal displacement of 5 to a vertical drop of 28 in average (sked 5, = 10°). The height of the ruins of the pyramid today are approximately 4.5 m. To day the architectural composition is difficult to determine because the inner parts of the nucleus were practically removed before Petrie investigated the monument, it was made up, however, of a core and 3 accretion layers. The investigator reported that they did not find any dressed blocks, but without clearing the fallen blocks and rubble which has accumulated on the sides of the pyramid down to the original desert level one cannot exclude the possibility of evidence of outer facing, as the case is at Seila, Hebenu, Sinki, and Elephantine. The sides of the square core measure 5.8 m (11 cubit) and the 3 accretion layers have a thickness of approximately 2 m (4 cubits), all the nuclei of the other minor step pyramids have 2 accretion layers. If we consider an additional accretion layer for the outer facing, the base length of the pyramid would be 22 m, if no casing was intended and the monument stood as a nucleus, the base length would be 18 m. The pyramid is oriented by its NS axis 12°, thus deviated approximately 23° west of the river course.

The area surrounding the pyramid has shown that it was used as a burial ground before the monument was built, one of these burial pits was found by Petrie and Quibell near the centre of the pyramid. We probably should not be misled in believing that the pyramid had a funerary function, as the case is at Elephantine.

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## **THE LAYER MONUMENT: SINKI AT ABYDOS**

Known name: Sinki.

Arabic name: el Sinka.

G-R name of the site (The 8th nome Abydos)

### ***Geographical information of the site:***

The site of this layer monument is on the map of Egypt (1:25 000) ABU SHUSHA portion of sheets 38/705 and 38/690 of 1982 and (1:100 000) NAG HAMMADI portions of sheets 36/66 & 36/72 of 1938. The coordinates, on the UTM kilometre grid are 384.5 N, 711.5 E (=26° 09' N 31° 57' E). It is located 5.5 km, SE of the Temple of Seti the 1st, to the west of the village of Nag Ahmed Khalifa; and now only a few tens of metres from the expanding cultivation. The predynastic site of el Amrah lies 4 km south east of the layer monument. At this point the western mountains are at their closest distance (1 km) from the cultivation then they retreat to the SW into wadi Beni Hemil. The shortest distance between this monument and the river is 5.5 km in a NW direction. The course of the river at this area between the islands of Naqnaq and Nasirat flows in semicircular way: SW, NW and N for a distance of 16 km. the layer monument Sinki, however, is west of the area where the river alters course from SW to NW.

### ***History of exploration, dates***

In Egyptological literature the monument had been vaguely mentioned by Charles Wilbour, James Quibell and Flinders Petrie. In a personal letter in 1882, Wilbour mentioned a similarity of the Abydos pyramid (Sinki) with the pyramid of el Kula. Jean Capart edited a publication of these letters and identified it with an 18th Dynasty mound believed to be a pyramid dating to Ahmose 1st, which is known locally as Kom el Shiek Mohamed. In 1900, Quibell working on the Hiraconpolis temple revetment, saw that it had a similarity in style, material and construction with “the rough stone mastaba pyramids of El Kulah, Nubt, El Amrah (Sinki) etc. which are now known to belong almost certainly to the II<sup>nd</sup> Dynasty”; it is not known to me how he dated these monuments. Petrie followed this trend in 1901 in an architectural journal. The monument did not receive any attention and Capart’s mistake was most misleading. As a result Sinki was forgotten and was never considered in pyramid research. On 27 October 1977, Nabil Swelim discovered the layer monument Sinki, and in 1980, excavated it jointly with Gunter Dreyer for the German Institute of Archaeology in Cairo.

### ***Body of the subject***

In a similar way to Nubt, the layer monument Sinki breaks the monotony of the desert plain. At the time of the discovery, a mound of big pebbles had accumulated by women who wanted to become pregnant; every woman threw 7 pebbles at the west side of the pyramid. Sinki is an unfinished accretion layer monument oriented by its NS axis 315° , consequently by corners to the cardinal points like el Kula. It would be difficult to establish a relationship with the changing course of the Nile in this area. It was constructed of shapeless concretions and roughly hewn limestone blocks brought from the neighboring western mountain. The largest blocks reach 1.6 x 0.6 x 0.4 m. in size. The courses are of an average of 0.3-0.35 m high, with a small irregularity in their levelling of 10-15 cm. A clay mortar was thickly applied over each course filling in big gaps between the stones. The beds are inclined backwards creating a horizontal displacement of 5-7 to a

vertical drop of 28 in average (sided 5-7 = 10° -14° ). The height of the ruins of the pyramid today is approximately 5.7 m.

During the excavation, two connected robbers trench-caves were discovered. The eastern showed that like other minor step pyramids (except Nubt) the nucleus was composed of two layers of about 2-2.5 m (=4-5 cubits) thick and a massive core of an average base length of 10.4 m (=19.8 cubits). The northern one showed that the nucleus on this side was composed of a core and one unexpected layer of double thickness 5.4 m (=10.3 cubits); this thickness is seen at the pyramid of Meidum. Another unexpected building feature was seen in a large block of limestone which was projecting out of the inner layer into the outer layer for more than one metre on the west side near the western corner of the nucleus. The base of the nucleus measured between 18.4-18.9 m (=35-36 cubits). A foundation surrounding the nucleus was built for an outer facing to come over, it was of a width of 2.4-4.3 m (=4.6-8.2 cubits); the average side length which becomes the pyramid's base length is 25.09 m (=47.9 cubits). The whole project was discontinued before an outer facing was built. The horizontal angles of the squared foundation corners are: N, 91° ; E, 88° ; S, 93° ; W, 88° . It was built of two courses of masonry as the case is under the outer facing at Hebenu. They differ from the platform under Elephantine pyramid, by having a width of an accretion layer. The plan of the pyramid shows that the corners of the core and layers of the nucleus were not as correctly oriented as the pyramid to be. The monument was built in a pit of about 0.6 m deep over a thick layer of mortar on the gravel.

Most important were three types of small settings of mud brick markers: at the corners of the pyramid (foundation) and the nucleus, along the side of the foundation and across its width. These markers are of the same nature as bricks noted on the east side of the Layer pyramid at Zawyet el Aryan. Here we have evidence of the pyramid planning as predetermined by its builders. The corner markers determine the extents of the architectural components; those along the sides show the layer alignment and those across the foundation determine the backward inclination of the courses of masonry.

Another important discovery was the construction ramps, which were found in situ. The beginnings of the ramps were on the surrounding desert; they were built over the gravel and the foundation of the outer facing and ending on 4 sides of the nucleus. These 4 ramps were constructed by a filling between 2 parallel walls. It was unfortunate that neither the length nor the angle of incline of the ramps could be determined.

The entry **The minor step pyramids** of this encyclopaedia deals with the architectural comparison, the date and the function of this monument.

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## **THE LAYER MONUMENT: EL KULA**

Known name: el Kula pyramid.

Arabic name: el Kula pyramid.

G-R name of the site: (north of the 3rd nome of Hieraconpolis)

### ***Geographical information of the site:***

This monument is recorded by its name el Kula pyramid on the map of Egypt (1:100 000) IDFU portions of sheets 24/72 and 24/78 of 1943 and (1:25 000) EL SIBAIYA portions of sheets 27/780 and 27/765 of 1987 its coordinates on the UTM kilometre grid are 271.9 N, 789.8 E (=25° 08' N, 32° 44' E). It is located 200 m SE of the village of Nag el Miamaria at a distance of 500 m from the Nile where the cultivation on the west bank is narrow. The course of the Nile between the islands of el Hellah and el Kalh is 300° for 30 km. The pyramid is oriented by its NS axis 315° thus deviated 15° east of the river course.

### ***History of exploration, dates***

The pyramid was described by H.Vyse and J.Perring in 1842. Later in 1882 an investigation that led to the destruction, seen today on the north side, was made by G.Maspero, K.Brugsch, E.Naville and C.Wilbour. They discovered a graffiti indicating that a Frenchman named J.Rifaud, who was an agent of the Consul of France Drovetti, worked at the pyramid in 1820. The investigation which followed was made by J.Capart 1946, his Architect J.Stienon made some sketches in brief article in 1949. Maragioglio and Renaldi; Lauer; Kaiser and Dreyer; and Swelim added a little in their research between 1962 and 1983.

### ***Body of the subject***

This layer monument preserves more height (8.25 m) than any of the other ones, excluding Seila, Its location on the low limestone plateau overlooking the cultivation is impressive. The is an accretion layer construction, the nucleus (2 layers and a core) is preserved and only little evidence of the outer facing was reported. Vyse had counted 27 courses of masonry, and now there are only 20. Unlike Hebenu, Sinki, Nubt and el Ghinmiya the nucleus of this is built on the bed rock and as the case is at Elephantine it is not level. At the NW corner the lowest 3 courses of masonry do not run the whole side length to the SW corner.

According to Stienon the base length of the nucleus is 18.6 m and the accretion layer thickness was 4.5 cubits (= 2.36 m). The thickness however is not uniform because the angles of the faces of the core and the layers slightly differ, resulting in a change in thickness. With the inner layer the higher it gets the thinner it becomes and with the outer layer the higher it gets the thicker it becomes.

The nucleus is entirely built of limestone blocks the size of which was determined by the thickness of the geological bedding of the surrounding formation. We observe a variety of dimensions, the larger blocks (1 x 0.6 x 0.4) are used in the lowest course of the nucleus on the north side and the smallest in the lowest course on the south side. The beds of masonry are inclined backwards creating a horizontal displacement of 4-6 to a vertical drop of 28 in average (seked 4-7 » 8° - 11°). The mortar is a mixture of clay, mud, and sand and crushed limestone.

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## THE LAYER MONUMENT AT EL GHENIMIYA

Known name: Pyramid of el Ghenimiya or Edfu south.

Arabic name: Locally called Abu Sinnah

G-R name of the site: (south of the 2nd nome of Apollinopolis magna)

### ***Geographical information of the site:***

The location of this comes on the map of Egypt (1:25 000) IDFU sheet 25/795 of 1957 and (1:100 000), IDFU portions of sheets 24/72 and 24/78 of 1943 as 'Ancient antiquities'; its coordinates on the UTM Kilometre grid are 250.8 N, 800.9 E (=24° 57' N, 32° 50' E). This marks the beginning of a desert track leading to Wadi Halfa on the Northern border of the Sudan. The site is fairly flat, but disturbed and 2 places overlooking the cultivation are used as modern cemeteries. Hills can be seen 2 km north and 1 km south of the pyramid. This site is located 5 km SW of the temple of Edfu, 1.5 km north of the village of Nag el Ghenimiya, 50 m west of the cultivation and 2 km west of the Nile. The course of the river between the el Ghenimiya and Edfu is bearing 25° for 5 km.

### ***History of exploration, dates:***

This was not known to pyramid research until 1980 when W.Kaiser and G.Dreyer learnt about it from Mohamed A. Aly the inspector of antiquities of Edfu. They subsequently visited and published a brief account of their observations.

### ***Body of the subject:***

The appearance of the layer of el Ghenimiya is not impressive, it looks like a low mound and can only be detected as a pyramid by someone who knows such monuments. It had never been archaeologically explored, but has suffered much destruction. On the surrounding areas north and west of the pyramid are a few small mounds of rubble which may have resulted from the plundering. Since the geological formation is generally sandstone in this area the Minor step pyramid of el Ghenimiya is the only pyramid totally built of that material. All sides except parts of the east and south side are covered with rubble, and it would be difficult to estimate the orientation. The height of the present ruin is approximately 5.5 m above the surrounding desert. It is an accretion layer monument built of blocks of masonry measuring 0.8x 0.6x 0.3 m in average. These blocks are better shaped than those used in the nuclei of Hebenu, Sinki, Nubt and Elephantine, they are set in a light gray coloured clay and sand mortar, in courses 0.3 m high. The beds are inclined backwards creating a horizontal displacement of 7 to a vertical drop of 28 in average (seked 7 = 14°). The architectural composition could be seen from some destruction and slightly exposed parts. The nucleus is made up of a core and 2 accretion layers. The outer facing cannot be detected at present. An estimate of the core measurement is approximately 10 m (19 cubits) at the pyramid base and the 2 accretion layers have a thickness of approximately 2 m (4 cubits). If we consider an additional layer for the outer facing, the base length of the pyramid would be 22 m.

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## THE LAYER MONUMENT OF ELEPHANTINE

Known name: Pyramid of Elephantine

Arabic name: None

G-R name of the site (The first nome of Elephantine)

### ***Geographical information of the site:***

The location of this monument is on the map of Egypt (1:25 000) ASWAN parts of sheets 15/795 and 15/810 of 1988 and (1: 100 000) ASWAN sheet 12/78 of 1940. Its coordinates on the UTM Kilometre grid are 156.5 N, 806.5 E (=24° 06' N, 32° 53' E). Built on the island of Aswan (Elephantine), on the east bank of the river lies the city of Aswan, on the west bank are sandy cliffs and in between the island of el Nabatat (Kitchner or botanical garden). The course of the Nile in this area between the mountains of Sluga in the south and Quubet el Hawa in the north flows in a course bearing 35° for 5 km. On the archaeological site the pyramid is 120 m NW of the Old Kingdom city and south of the present Nubian village.

### ***History of exploration, dates:***

Early in the 20th century, this pyramid was thought to be the foundation of a temple of Jehovah established by a Jewish community on the island. Subsequently it was noted as a *granitmassiv*. The monument was never introduced to pyramid research until G. Dreyer investigated it in 1979 and published a plan and section showing that it was indeed an accretion layer monument. Dreyer's logical reconstruction of a step pyramid shows one of a few possibilities these ruins can lend themselves to.

### ***Body of the subject:***

The appearance of the layer monument of Elephantine is not impressive, taller ruins of a later date stand in its immediate background; the pyramid was actually buried under these buildings at the beginning of this century. In spite of that the monument is unique because it is the only pyramid in Egypt the nucleus of which is totally built of granite. It is oriented by its NS axis 343°, thus deviated approximately 52° west of the river course. It was built on an unlevelled area on top of the highest natural ridge on the island. The ruins of the monument preserve the lower part of the nucleus (2 accretion layers and a core) to a height of 5.1 m above the surrounding area. The base length of the nucleus measures 18.46 m (= 35.23 cubits), this measurement results in a diagonal of 25.8 m (= 49,3 cubits), which perhaps was planned on the bases of 50 cubits. This nucleus was built over a partly preserved levelling square platform with a side length measuring 23.7 m (45.23 cubits) and varying in height in accordance with the irregularity of the natural surface between 0.7-0.8 m. The difference between the side length of the platform and the base length of the nucleus is 5.24 m. This allows for an accretion layer of outer facing of 2-2.5 m (= 4-5 cubits); otherwise the extension of the platform beyond the limits of the nucleus would result in poor explanations. Consequently one could assume on the bases the similar and more positive examples at the Step Pyramids at Saqqara, Seila, Hebenu and Sinki that the monument did have an outer facing which is presently lost.

A marked contrast in construction was reported by the investigator, the platform was built with irregular pieces of rose granite set in mud and sand mortar, while the nucleus was built with larger unshaped dark granite blocks set in a very hard reddish clay mortar.

Earlier investigators or robbers cut a trench into the north side of the monument down to bed rock and found, close to the centre, a natural hole of 1.5 m in diameter and depth. Such holes exist at many places in Aswan and in the granite east of the pyramid; they were created by whirlpool erosion in geological times and one should not be misled by this hole into believing that it was for a burial. It must be noted that the layer monument of Nubt was built over an earlier cemetery and a pit was found in the same location as this monument.

The courses of masonry are regular and have a height of 0.3-0.4 m. At the core of the nucleus the courses are laid in horizontal beds, and they incline backwards in the accretion layers.

The base of the core measures 10 m and its face has an angle of about  $13^{\circ}$  off the vertical (= seked 5-6). A curious dividing gap in the construction, is seen and recorded on both sides of the trench, it is straight line, slanting outward and of a height of 2 m. This observation may indicate that the core was originally planned smaller with a less westerly deviation from the magnetic north and the course of the river.

The inner accretion layer is of a uniform thickness of approximately 2 m (= 4 cubits) and has the same angle as the core. The thickness of the outer one is of the same measurement at the base, but increases the higher it gets creating a decrease in the outer angle (of the whole nucleus) measuring approximately  $10^{\circ}$  off the vertical (= seked 5).

The investigation led to the discovery of 2 interesting builders marks on 2 blocks, the first was a simple cross and the second was a square in which is a cross and a dot in one of the divisions.

Close to the pyramid in 1909 J.E. Gautier found the famous granite cone bearing the name of King Huni of the Third Dynasty (now in the Cairo Museum JdE 41556). Kaiser and Dreyer thought that it came from the pyramid and consequently dated all the minor step pyramids to this king.

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