

ORIENTALIA MONSPELIENSIA IX

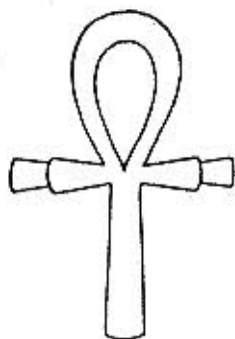
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The Pyramid Court and Temenos Wall of Khafre

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Le Caire

In the course of the history of the Step Pyramid Complex at Saqqâra, no more than two persons mastered its architecture: Imhotep, the builder and Jean-Philippe Lauer, the restorer. To Monsieur Lauer, our fatherly teacher and senior pyramid scholar, I present this study on the Pyramid Court and Temenos Wall of Khafre.

The bed rock of the Gîza plateau is a yellowish white limestone with *nummulites gizehensis* in the middle part. It is more than 120 m. thick, and generally known as the Moqattam Formation.¹ The highest point on the plateau, 100 m. above sea level, is less than half a kilometer west of the pyramid of Khafre.² The plateau dips south-south east at an angle of 6°. The present pyramid complex of Khafre is constructed on an artificially leveled area of approximately 70 m. above sea level. Fig. 1 shows an axonometric view of the pyramid complex: the inner enclosure, the present court, the north and west rock walls, the unfinished areas of the intended pyramid court, and the north megalithic wall, the south wall with an elbow and the west stone wall. This short study suggests that the intended court was to be leveled beyond the present court to unfinished walls which would finally become a temenos wall.³

The civil engineering projects undertaken at the pyramid complex of King Khafre, are outstanding. The site chosen to build the complex presented additional quarrying, leveling and constructions on a gigantic scale. A site map extracted from the maps « Le Caire F 17, F 18 », 1:5000, maintains the scale and archaeological features [fig. 2]. All locations mentioned in the text are indicated on it.

The present height of the pyramid of Khafre is 143.87 m. The base length is 215.18 - 215.31 m. It is oriented to the cardinal points with minute errors between 6° 31" to 4° 21".⁴ Judging by scattered blocks of good quality limestone, the outer edge of a pavement, and preparations of the bed rock, the pyramid was surrounded by a finely built inner enclosure. Thus a narrow paved court, twenty cubits wide, lay between the base of the pyramid and the inner enclosure. The present court goes beyond the inner enclosure wall.

The present court.

The present court was accomplished by vertical cutting in the sloping plateau from 80 m. levels to a level of approximately 70 m. Lower levels to the east were raised by the construction of joining terraces. The ground level beyond the enclosure wall gently slopes downwards to the limits of the present court. These limits are:

— The north rock wall is at a distance of 56.72 - 57.28 m. from the pyramid base. It is 10 m. high at the north-west corner of the present court, and decreases in height towards the east covering a length of 230 m. At a distance of 12 m. from the north west corner, below a graffito from the time of Ramesses II, the famous quarry of Khafre is located [see A on fig. 2]. It runs east for a length of almost 50 m. and south for a width of 20 m. At this site, a grid of unfinished trenches, a little more than one cubit wide and 0.30 - 0.40 m. deep, would have supplied limestone cubes of 3 x 3 x ? m. It is worth noting that the grid and the north rock walls are not parallel. North west of Menkaure's pyramid is a similar quarry; the unfinished cubes are partly sanded over [see B on fig. 2]. Towards the east, in the area where the level of the bed rock begins descending below the 70 m. level of the present court and the rock wall is no longer there, a constructed terrace joins the leveled rock [see C on fig. 2]. It covers an area of approximately 60 x 70 m. A similar terrace [see D on fig. 2], covering an area of approximately 50 x 90 m., is found south-east of the pyramid.⁵ Some of the megaliths used to construct these joining terraces reach 10 x 10 x 1 m., thus weighing over 200 tons and are of the same order as megaliths used for building the upper and valley temples, and the north megalithic wall of this complex.

— On the east axis of the pyramid, over an easterly projection of the bed rock, the upper temple, boat pits and a descending causeway are located. The east limit of the present court is where the joining terraces end, at a maximum distance of 44.60 m. from the pyramid base. The work on this project is unfinished, I believe that the terraces would have extended to the east, the north megalithic wall and the wall with an elbow. Three courses of the megalithic construction can be seen in section having a height of 3 m. [see E on fig. 2].

— On the south axis of the pyramid, the ruins and substructures of the subsidiary pyramid are situated. Beyond them to the south a small *wady* causes the present court to slope gently to the south and east [see F on fig. 2]. There are no reference points for measurement between the pyramid base and the wall with an elbow.

— The west rock wall is at a distance of 27.50 - 28.07 m. from the pyramid base. It is 10 m. high at the north-west corner of the present court, and decreases in height towards the south covering a length of 380 m. In the area where the level of the bed rock begins descending below the 70 m. level of the present court and the rock wall is no longer there, the small *wady* mentioned above extends to the wall with an elbow. The rock wall lines up with white limestone marker blocks in the lower course of this wall [see G on fig. 2]. During the Vth and VIth dyn. the so-called Rock Cemetery was tunneled into the face of this wall. Thirty finished and unfinished rock tombs can be seen today and a second graffito from the time of Ramesses II.⁶

The intended pyramid court.

The upper and valley temples were completed, but the leveling of the intended court, joining terraces and temenos wall were in progress when the work was discontinued. This halt could have been due to the death of Khafre.⁷

I assume that the intended court would have been leveled and would have extended beyond the rock walls on the north and west sides, and to the wall with an elbow on the south side. To the east, however, there is no evidence of where the temenos would have been. I would suggest that it would have been built after the completion of the joining terraces to include parts or all of the upper temple. Consequently the intended court would have probably occupied an area measuring 465.94 m. (north-south) by 423.67 m. (east-west).

In fig. 2 are three sections of the pyramid complex of Khafre looking south where one can see: 1. Before the complex was built, the desert surface as it was sloping downwards to the east. 2. The present complex as we see it today: the upper temple, unfinished joining terrace, enclosure wall, west rock wall, trenches on the upper desert surface and the west stone wall. 3. The complex as intended with the suggested joining terrace, the suggested east temenos, the intended court and the west stone wall as a temenos.

The rock walls reveal a geological section in the uppermost Moqattam Formation.⁸ Many vertical joints run diagonally in the court. A top horizontal hard cap of the weathering surface. Three horizontal layers of massive limestone with *cavernous* patches. These layers are separated by *argillaceous* limestone, or cavities guided by horizontal bedding planes. The top horizontal hard cap was broken up into small unshaped blocks used for building the west stone wall, the west part of the wall with an elbow, and the ramp embankment of the north megalithic wall. The massive limestone was quarried layer by layer as megaliths, primarily for leveling the pyramid court, and secondarily for the construction of the terraces, temples and north megalithic wall. On those monuments the megaliths show features of the rock wall section.

In the top desert on the north side, a sandy depression 50 m. wide lies between a quarrying trench and the north megalithic wall. It was created by extraction of megaliths. This depression suddenly narrows towards the east where some unfinished megaliths are still *in situ*. They are surrounded by trenches more than one cubit wide. The trenches are at distances of 9.7, 18.7, and 26.4 m. from the north rock wall [see H on fig. 2]. An asphalt road runs along the north megalithic wall on the inner side.

On aerial photographs of the top desert on the west side,⁹ one can see that the area beyond the west rock wall, had been marked for trenches [see I on fig. 2]. Three of them were just begun at distances of 16, 38, and 58 m. from the west rock wall. The west stone wall is found 10.5 m. from the westernmost trench. The north part of this area had been quarried in 2 places: in the upper part of the west rock wall, and to the west of it [see J and K on fig. 2]. An asphalt road runs parallel to this wall on the outer side. To the west of the road are the so-called Workmen's Barracks.

On the south side where the plateau begins to slope below the 70 m. level, the sandy *wady* has eroded the south part of the present court. In this *wady*, separating the pyramid complexes of Khafre and Menkaure is the wall with an elbow. The eastern area south of the joining terrace rapidly decreases in height to the Central Field [see L on fig. 2].¹⁰ The leveling of the south side of the court with all the other sides would have been by the construction of a joining terrace.

The present walls.

The temenos wall was begun as the north megalithic wall, the wall with an elbow to the south, and the west stone wall; on the east side, no indication of the temenos wall has been hitherto found.

The north megalithic wall separates Khufu's Western Cemetery [see M on fig. 2], from Khafre's unfinished pyramid court. The wall is at a distance of 128.14 m. from the pyramid base. The length of the wall is 388 m.; its width over the desert level at the east end is 9.50 m. In 1883, Fl. Petrie published some observations: "On the N. side it is a wide substructure of very large blocks, rather rudely hewn, and bearing cubit marks and numbers on the backs. Its original height cannot be easily settled... On its S. face this wall is much less finished, and has been banked up to the top of the broad part by a vast heap of chips, which have been kept in position by building retaining walls in them..."¹¹

A clearance at the east end of the north megalithic wall was made by Zahi Hawass. He will publish his work in more detail. For the purpose of this short study, the megaliths seem to have been quarried from the depression to the immediate south of this wall. Fig. 4, and N on the site map [fig. 2], show the dimensions of the megaliths. The latter reveal small quantities of hard lime mortar at joints. One of the blocks has a leveling line in red which appears to be almost at the same level as the pavement in the narrow court of the pyramid. This block was placed upside down, as the curve at the bottom of the quarrying trench, from which it came, is projecting at its top side. Two quarry marks are read upside down also. The sides of the quarrying trenches appear smoother on all megaliths.

Z. Hawass cleared one side of Fl. Petrie's "retaining walls". This was probably a construction ramp built of rough blocks from the hard cap of the weathering surface. The retaining wall was built on a compressed layer of limestone chipping which were the exact height of the lowest visible course of megaliths. The blocks of the retaining wall were on average 0.20 - 0.30 x 0.25 - 0.40 m. and bound by a dark grey mud mortar.

A short distance north-east of location N on the site map, a sloping passage descends in a southward direction to a burial chamber and a sarcophagus, above which is a shaft open to the sky. It may suggest the beginning of an unfinished subway crossing tunnel. In this respect three others, two crossing the causeways of Khufu and Khafre, and a third built through Heet el-Ghurab south of the Sphinx, must be mentioned.

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The wall with an elbow is at a distance of 131.22 - 140 m. from the pyramid base. The eastern part measures 152 m. to the elbow; the elbow measures 10 m., and the western part measures 230 m. to the west stone wall, and 450 m. to the west stone wall of Menkaure. At a distance of 20 m. west of the elbow, this wall is joined by a similar wall coming from the south. The elbow comes between two walls which are very different. Fl. Petrie observed that "The true peribolus wall of the Second Pyramid, on the S. side, is only a short piece, 500 feet long, which appears to have been incomplete when the Third Pyramid walls were begun; since it was merged into the latter by an elbow wall... It is a fine piece of work as far as it goes, and was apparently intended to be at the same distance from the Pyramid as is the great North wall".¹² The elbow, the wall west of it, and the joining wall have their masonry bound and plastered with Nile mud mortar, otherwise they are similar to the west stone wall discussed below.

Fig. 5 [see O on fig. 2] shows that the eastern part of this wall was not excavated; it is 3 m. wide above the desert and tapers as it rises. It was finely built in regular courses varying between 0.30 and 0.40 m. in height. The binder used was a pink lime mortar which was very thinly applied.

While Fl. Petrie's explanation of the elbow seems logical, boundaries in earlier times demonstrate a similar plan. The earliest example is seen on Narmer's mace head at the Ashmolean Museum.¹³ It shows an enclosure, where the end of the outer wall proceeds in an anti-clockwise direction, and the end of the inner wall in a clockwise direction. At Umm el-Gaab, G. Dreyer¹⁴ has shown that the embankment walls retaining buried tumuli are single on three sides, but on the fourth side two walls overlap. This may be the case on the south side of Gisir el-Modir,¹⁵ and the Dry Moat of the step pyramid complex.¹⁶ Consequently if Petrie's explanation was the case, it certainly fulfills a tradition maintained by some predecessors.

The west stone wall is at a distance of 99.70 - 101.75 m. from the pyramid base, and has never been excavated. It is built of rough masonry with no traces of mortar. It measures 440 m. long and 2.10 - 2.50 m. wide over the desert surface, and the sides taper upwards. It separates the Khafre complex from an asphalt road and the so-called Workmen's Barracks. This wall seems to have run as far as the north stone wall of Menkaure's complex, but the last part has been destroyed. Fl. Petrie observed that "Exactly from the end of this great wall, there turns off a much narrower wall, which runs parallel with the W. side of the Pyramid. This W. wall is 70 wide at the top. It is built of rough scraps and blocks of limestone, neatly fitted together with a smooth face... and it runs on till it joins the wall of the Third Pyramid"¹⁷. Fig. 6 [see P on fig. 2], shows a drawing of this wall.

The temenos wall.

Considering the walls discussed above, it looks as if they were built with stone from the nearest source. I suggest that the temenos would have eventually been built with megaliths and cased with fine limestone on all sides. The top of the wall would have been level, i.e. at a uniform height from the level of the intended court.

On the north side the final project was underway, the quarry was at the foot of the megalithic wall where lies the sandy depression. The ramps on the south side were piled up chipping with stone walls retaining them. A systematic process was followed, new ramps were constructed over old ones as the courses were being laid. This method was already in use at the layer monument of Snofru at Seila (publication forthcoming).

On the east side the construction of the joining terrace was underway; had it been completed, a wall of the same magnitude would have been built.

On the south side the east part of the wall with an elbow was built of fine blocks of limestone. It creates a problem because it is founded below the intended court level, and it neither resembles the megalithic wall nor could it have reached the required height. I suggest that the death of the king caused the intended plans to be changed. Thus, outer facing blocks prepared for some purpose were employed at this location. When Menkaure built the western part of the wall and created the elbow, I believe a quick solution was being carried out, because his complex was left unfinished also.

On the west side, the final construction was far behind, Four rows, each row supplying three layers of megaliths at most, had to be removed before the work could be completed. The marking of the trenches by removing the top cap may have supplied the rocks for building this dry wall.

1. Geological Map of Greater Cairo Area, Geological Survey of Egypt, Cairo, 1983.
2. The map « Le Caire F 17, F 18 », 1:5000, April 1977.
3. I thank Dr. Zahi Hawass, the director general of Giza and Saqqara for granting permission to make observations on the site. I also thank Mrs. A. Dobrowolski for the axonometric drawing in Fig. 1, and Mr. J. Dobrowolski for the drawing of Figs. 3-6; he made the drawings in Figs. 4-6 *in situ*. Professor Aleya Hafez of the Faculty of Science, Cairo University, kindly read the manuscript of this article and made some helpful comments.
4. Measurements published by V. MARAGIOGLIO and C. RINALDI, *L'Architettura delle Piramidi Menfite V : Le piramide di Zedefra e di Chefren*, Rapallo, 1966, Tavole, Tav. 5, fig. 1.
5. One of the megaliths, 24.2 m. west of the south-east corner of the pyramid and 21.20 m. from the pyramid base, has been extracted »see Q on fig. 2].
6. PMIII², Part 1, plans III, XIX, n° 2.
7. In that respect, I have noticed that his famous statue in the Cairo Mus. shows that it was unpolished in some places, and that the sculpture incised but never completed the arches on both feet.
8. Results of studying photographic sections of the west rock wall by Drs. M.A. Hemdan and A.N. El Barkooky of the Faculty of Science, Cairo University.
9. An example in M. RODENBECK, G. ROSSI, *Egypt from the Air*, London, 1991, p. 32.
10. PMIII², Part 1, plans XXI, XXII.
11. W.M.FI. PETRIE, *The Pyramids and Temples of Gizeh*, London, 1885, p. 33.
12. *Ibid.*, p. 34.
13. J.E. QUIBELL, *Hierakonpolis*, Part I: *Plates of Discoveries in 1898*, London, 1900, pl. XXVIB.
14. G. DREYER, "Zur Rekonstruktion der Oberbauten der Königsgräber der 1. Dynastie in Abydos", *MDAIK* 47, 1991, *Fs. für W. Kaiser*, figs. 1, 6-7, pl. 4-5.
15. N. SWELIM, "Some Remarks on the Great Rectangular Monuments of Middle Saqqara", *MDAIK* 47, 1991, p. 394, fig. B.
16. *Id.*, "The Dry Moat of the Netjerykhet Complex", *Pyramid Studies and Other Essays Presented to I.E.S. Edwards*, London, 1988, p. 14-16, 18-20.
17. W.M.FI. PETRIE, *The Pyramids and Temples of Gizeh*, London, 1885, p. 34.

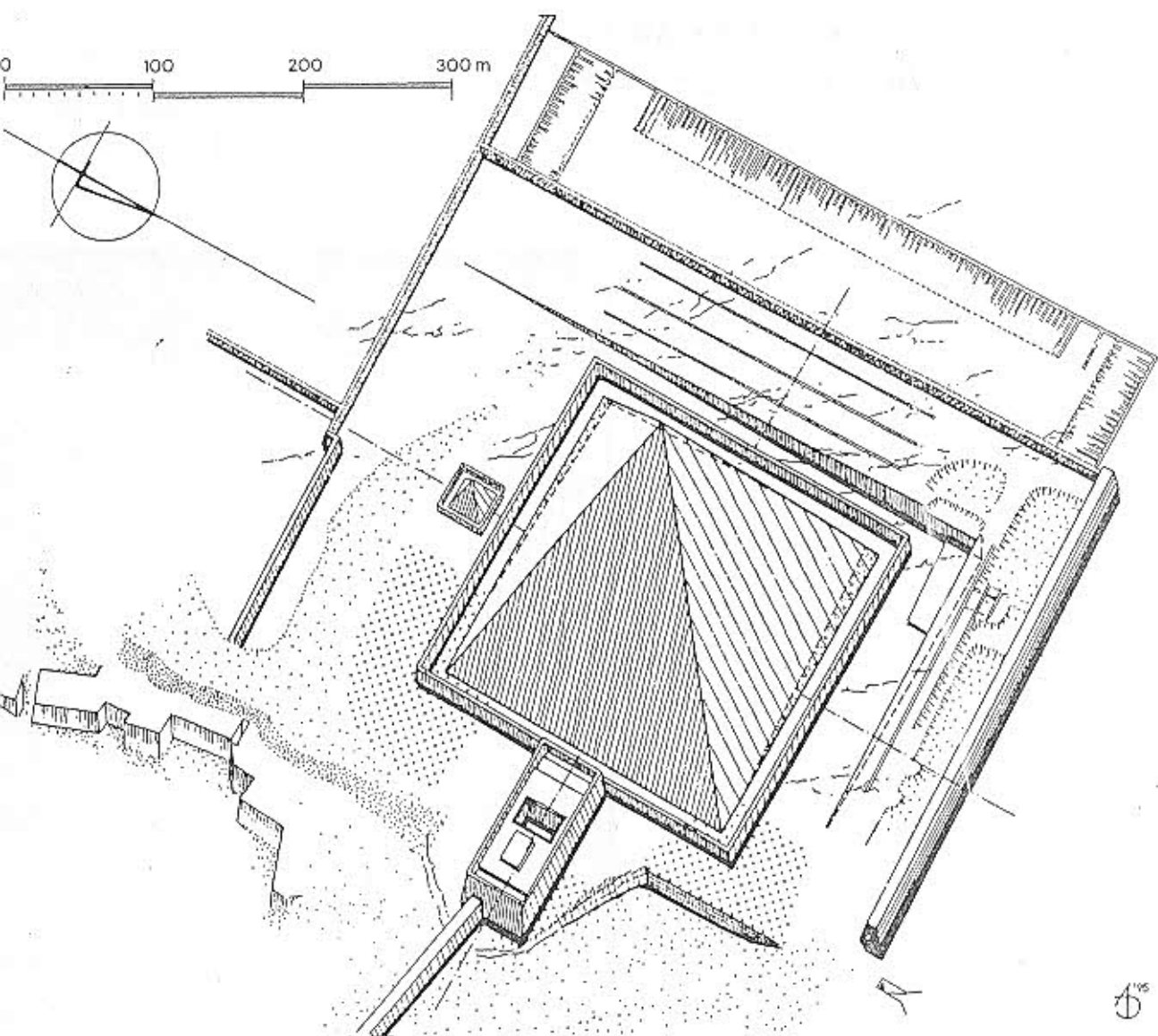
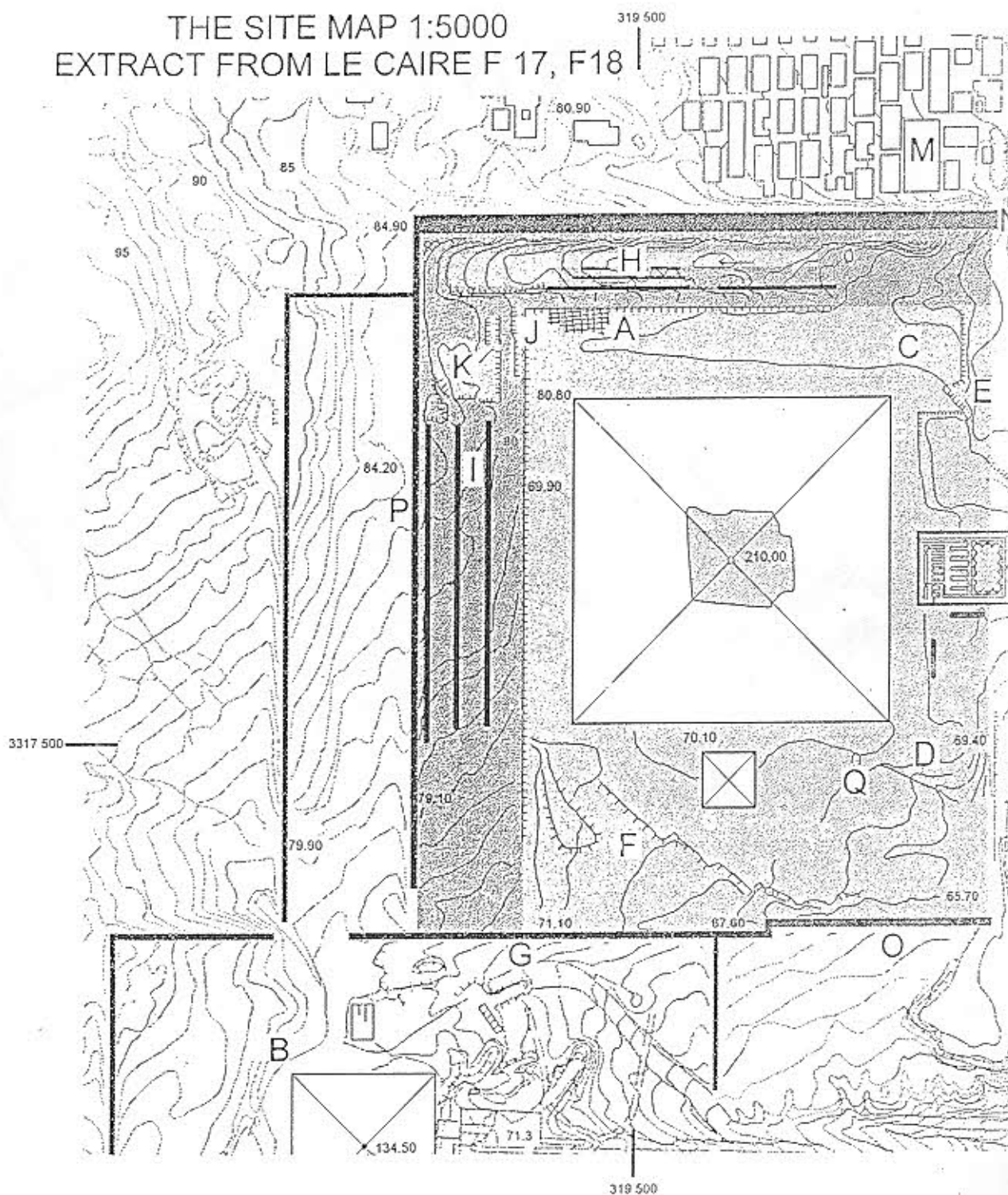


Fig. 1. An axonometric view of the pyramid complex of King Khafre.

THE SITE MAP 1:5000
EXTRACT FROM LE CAIRE F 17, F18



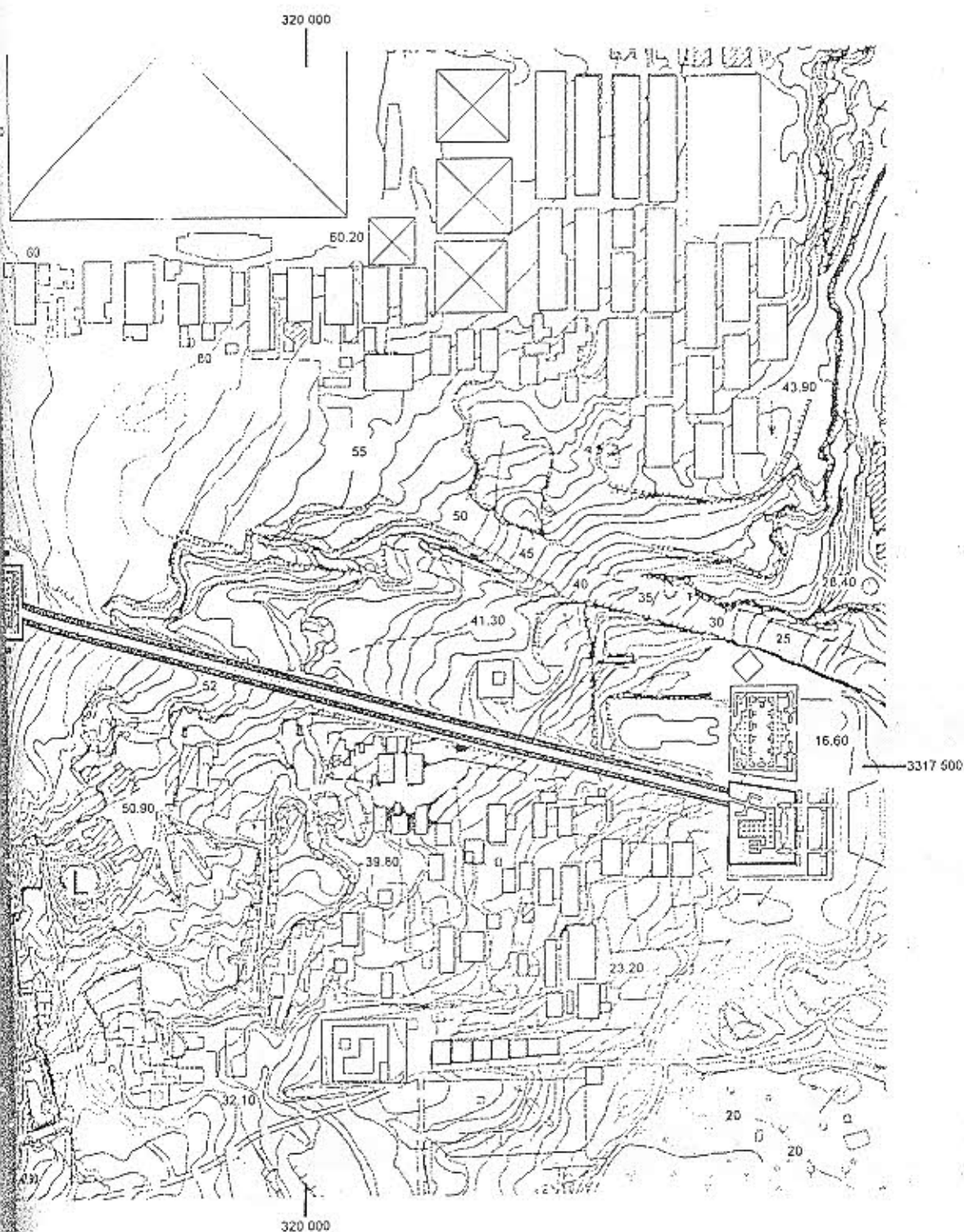


Fig. 2. Site map 1:5000, extract from « Le Caire F 17, F 18 ».

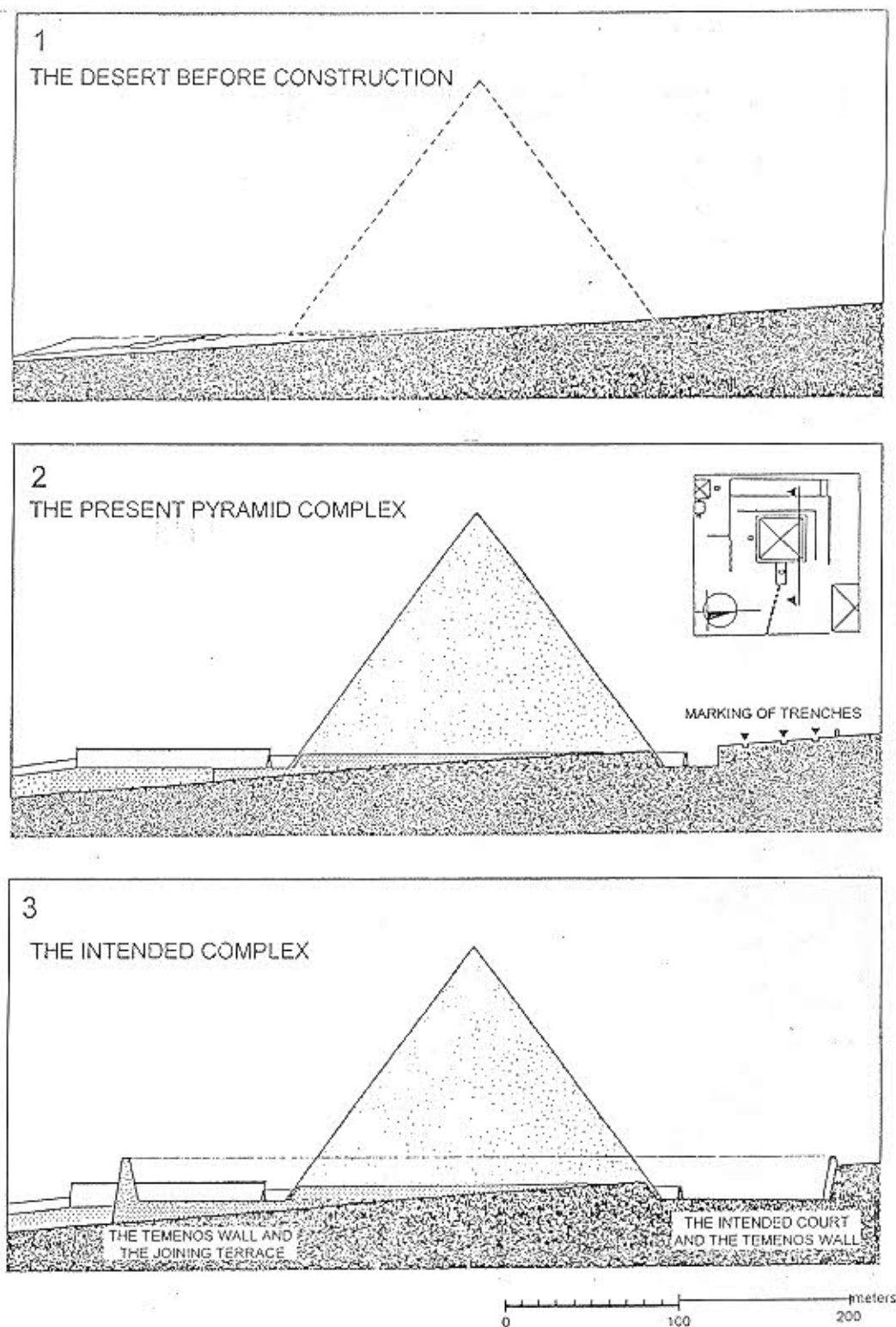


Fig. 3. Three sections of the pyramid complex of Khafre.

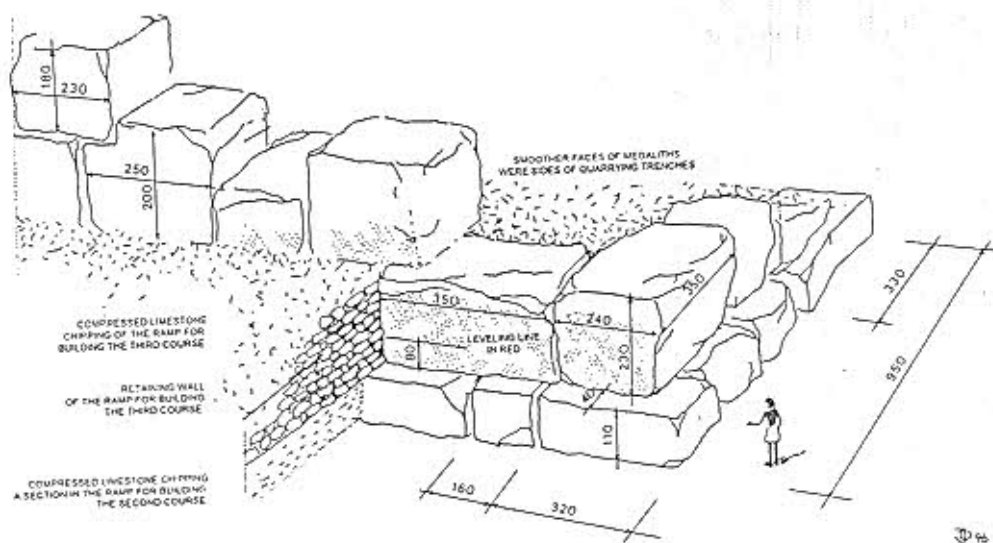


Fig. 4. The north megalithic wall east end (position N on the site map, fig. 2).

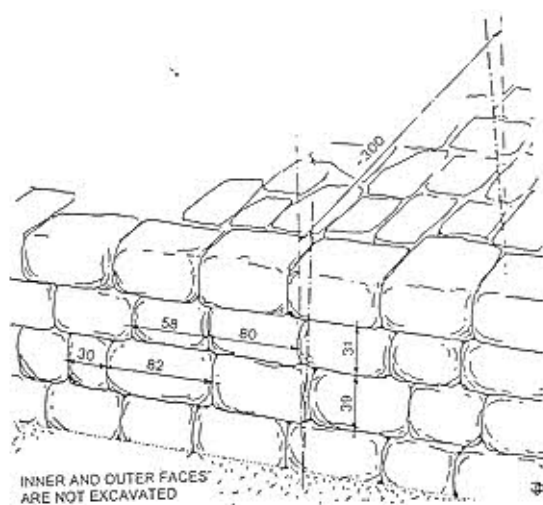


Fig. 5. The east part of the wall with an elbow (position O on the site map, fig. 2).

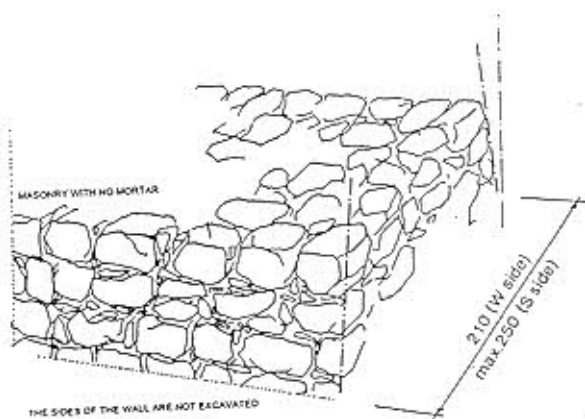


Fig. 6. The west stone wall (position P on the site map, fig. 2).