# ANCIENT EGYPTIAN FRONTIER FORTRESSES

By SOMERS CLARKE, F.S.A.

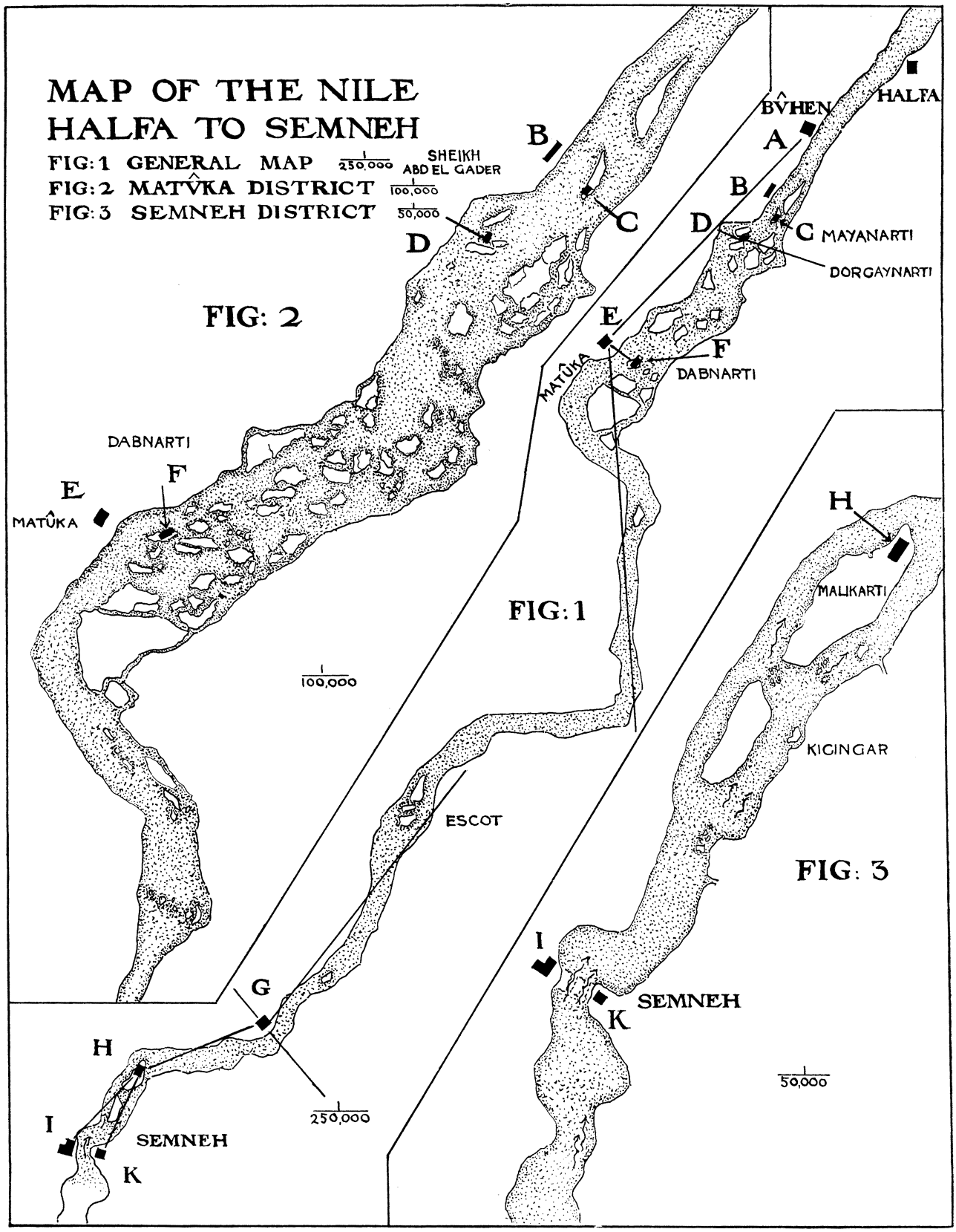
## I. Introductory.

The Second Cataract, called the Baṭn el-Ḥagar (Belly of Stones), is one of the most desolate parts of the Nile Valley. As at the First Cataract, so at the Second a reef of hard rock crosses the valley, and through this the waters of the Nile force their way from south to north; but whereas the First Cataract is but a few miles in length, the Second extends for more than a hundred.

It is obvious that a geological barrier giving rise to a series of rapids is very likely to offer itself as a frontier. This has been the case with the First Cataract in early Egyptian history. The desolate nature of the region added to its defensive value: not only was the water-way difficult to traverse and therefore more easy to defend, but the road by land was inhospitable and dangerous for the passage of considerable numbers of people moving at the same time. As Egypt became more consolidated and powerful it extended itself towards the south, casting hungry eyes upon the regions of the Sûdân, whence came many commodities, including gold and slaves. The Second Cataract thus became a frontier both as a base for defence against the wild folk of the south, and as a point of departure for raids and wars of aggression.

The map (Pl. XXIV) which I have compiled, to the best of my ability, partly from the materials kindly supplied me by the Sûdân and Cairo Survey officials, and partly from observations made by me on the spot, may give, it is hoped, some idea of the general features of the country and of the way in which the Egyptian military architects availed themselves of the natural features. The best map of the cataract at Semna, which forms but an item in the Second Cataract, is that made by Dr Ball and is printed in the *Quarterly Journal of the Geological Society* for Feb. 7, 1913 (Vol. lix); there is not to be found a more careful or exact cartographer than Dr Ball.

My map shows in Fig. 1 the course of the Nile from Semna to Ḥalfa. It seeks to be little more than an easily-read diagram. Its scale ($\frac{1}{250000}$) is so small that it is impossible to indicate even half the multitude of islands and rocks which crowd the northern end of the cataract, and which by their presence are the chief cause of its existence. On the other hand, it is hoped that the map may prove useful as indicating the relative positions of the various fortresses herein referred to. According to the scale which has been adopted the water-way of the Nile should be only half the width



shown; as I look on my map as no more than a conventional representation, I have taken the liberty here stated. As regards the distances from north to south no such liberties have been taken, but I fear there are many errors.

The various fortresses are marked in Fig. 1 by letters of the alphabet, thus making it more easy to describe their positions in relation to each other. Lines are also drawn showing the directions in which the garrisons in each fort could command the neighbourhood.

Fig. 2 gives what I have called the Matûka district to a scale of $\frac{1}{100000}$, which is larger than the scale of Fig. 1. There are very many more rocks and islands than are here shown.

Fig. 3 gives the Semna district to a still larger scale, $\frac{1}{50000}$, showing clearly the near approach to each other of the eastern and western banks of the Nile, and the promontory on which the fortress of Semna el-Sharq is built.

To return to Fig. 1: the fortress at *A* (Bûhen) did not stand high, but the islands at the mouth of the cataract could be well seen. The ground rises rapidly west of *A* so that an outlook from it could easily be got[1]. *C* and *D* lie low down, indeed but little above water-level. *E*, however, stands in a commanding position on a cliff with unbroken views up, down, and across the valley. The great size of this fortress shows it to be second only to Semna. The fortress *F*, like *C* and *D*, is on an island and but little above the water. *G* is in a most commanding position and has an outlook up, down, and across the valley. It is probable that there is some fortress between *E* and *G* of which I have no knowledge. *H*, though on an island, stands high and could be in communication with *G*, *I*, and *K*. *K* is even better placed with regard to *G* and *H*.

It is to be observed that *A*, *E*, *G*, and *I* are all on the western bank of the river, and that *C*, *D*, *F*, and *H* are on islands. *K* alone is on the east bank, which all the way is extremely rocky, rugged, and desolate.

It will be well to give a reason why a string of fortresses such as are about to be described was established, and this I will endeavour to do, not in my own words or out of the empty wells of a pretended knowledge, but in the language of my good friend Dr E. A. W. Budge[2]. "We may now briefly summarise the various steps in the conquest of Nubia under the XIIth Dynasty. Ȧmenemḥāt I conquered the Mātchaiu, Uauaiu, the Sitiu, and Ḥeriu-shā, and fixed his boundary near Korosko. Usertsen I conquered the four great tribes of the country, and fixed his boundary at Behen, or Wâdî Ḥalfa, one hundred miles further to the south than his predecessor. He drew large quantities of tribute from the natives, and sent, among others, Ȧmeni to bring gold to Egypt. He was perhaps the first king of Egypt to build a fort and found a town a few miles to the south of Korosko. The remains of both the fort and town were discovered in 1892 by Captain Lyons, R.E., who noticed on the rocks near several *graffiti* belonging to the XIth, XIIth and XIIIth Dynasties. These clearly indicate that the site was occupied by Egyptian officials under the Menthuḥetep kings of the XIth Dynasty, and this being so we may assume that it was a centre of Sûdân trade of considerable importance. In the reign of Ȧmenemḥāt II the officer Sa-Hathor went into Nubia

[1] For *B* in Figs. 1 and 2 see below p. 163.

[2] E. A. Wallis Budge, *The Egyptian Sûdân: its History and Monuments*, London, 1907, Vol. I, p. 553.

and began to work the gold mines of Ḥeḥ by means of native labour, on behalf of the Egyptian Government. The young men dug out the ore, and the old men carried out the operations connected with the final stages of washing out the metal. Under Usertsen III, the Egyptian frontier on the south was moved to Semna, and an edict was passed forbidding any negro to pass north of that place except for purposes of business or embassy. For eleven years at least, i.e., from his eighth to his nineteenth year, this king carried on a series of wars, which resulted in the complete subjugation of the country. He built a line of forts, which were occupied by native garrisons under Egyptian officers, between Elephantine and Semna, and in many of them he placed temples; he appears to have established a fortified outpost about eighty miles south of Semna, in the neighbourhood of Gebel Dôsha. From a portion of a monument discovered by Prof. NAVILLE (*Bubastis*, Pl. 34) we learn that Usertsen made a raid in a country called Ḥuā.

"Now a country called Ḥuā is mentioned in an inscription of a later period in connection with Punt, and if it be the same region it follows that he invaded the country on the western shore near the southern end of the Red Sea. If this be so, this king must have been absolute master of all the great trade routes of the Egyptian Sûdân, as well as of all the gold mines throughout the country. Before Usertsen's death arrangements were made for a systematic supply of gold for Egypt, and the caravans travelled on from fort to fort, bearing their precious loads to the old Egyptian frontier city of Elephantine in safety."

Since Dr BUDGE wrote the above the explorations of Dr George REISNER, working for the Harvard University Museum of Fine Arts, have thrown much light on the condition of things south of the Baṭn el-Ḥagar and of the fortresses here described. At Kerma, which lies on the east bank of the Nile, nearly opposite to New Dongola, stand two great masses constructed of sun-dried bricks. Dr REISNER's examination has shown one of these to be a temple, the other a fort. Near them lie great tombs, the resting-places of the Egyptian governors of the province. Inscribed fragments of statues were found, whereby it was possible to date one tomb to the early XIIth and another to the early XIIIth Dynasty. The largest of the tombs was seen to belong to the time of Senusret I, the occupant being a lord from Assiût, whose name is still to be read in the inscriptions of that place.

Grouping together these statements we learn how important were these fortresses: they had not only to hold in check the peoples of the South, but also to act in concert with the southern province as a base from which could be controlled the various trade routes, whether by water or by land. The grim desolation of the country must also have made it necessary that the fortresses should be well provided with stores. It would be out of place to give here the texts of the inscriptions relative to the above-mentioned events. They are for the most part well-known, and accessible to all those who are interested in the subject.

It may fairly be assumed that fortresses of importance already existed between the frontier at Elephantine and the Second Cataract before those in the Second Cataract were built. At the southern end of the island of Elephantine we still see great masses of crude brick walls; whether these may be, in part, the walls of the ancient fortress I would not venture to say. On the mainland and opposite the Nilometer there is a ridge of granite rock which has now, unfortunately, been deprived of its ancient air

of dignity and turned into a cockney garden; this runs back towards the east at right angles with the Nile. Here there still exists, more or less out of sight, a great mass of ancient brickwork, evidently belonging to massive walls. As we advance south of Aswân we observe several fortified places; and because the ruins now to be seen may in some cases belong to a date much later than the early Dynasties, we are not always justified by that fact in supposing that older structures might not be found, if the sites were carefully investigated.

The following is an imperfect list of the places of defence between Elephantine and the Second Cataract, most of them dating from the XIth and XIIth Dynasties:—

Koshtemna, or Ikkur.
Sabagura.
Kubân.
Korosko.
Amada.
Ḳaṣr Ibrîm.
Armanna.

In the Second Cataract, from Bûhen to Semna, are the following places:—

Bûhen. At the northern mouth of the cataract.
Mayanarti.
Dorgaynarti.
Matûka.
Dabnarti.
A fort on the west bank opposite Sarras, the present name of which I could not ascertain.
Uronarti, or, as it is called in Arabic, Gazîrat el-Malik[1].
Semna el-Sharq (east).
Semna el-Gharb (west).

Probably there are traces of other strong places yet further south.

With many Nubian places it is difficult to obtain any definite information as to the names by which they are now locally known; and so too it is with Semna. BURCKHARDT[2], who visited the place in 1813, writes the name as Samna; he does not give a separate name for the ruins on the east and on the west. LEPSIUS is, I think, the first who tells us that Semna is on the west and Kumma on the east[3]. Other travellers spell the names Semneh and Kummeh; others again write the latter name Kumna. The maps issued from the Survey Department write Semna and Kumna; the more recent of the two maps I possess is dated 1911. At the time of my visit in 1898, I inquired as carefully as I could—one of my servants was from Sarras, which is but a short way off—and was informed that the places were called Semna el-Sharq and Semna el-Gharb; nothing was known of the names Kumma or Kummeh. It is really to be regretted that more care is not taken when the surveys are made. On one map is to be found the legend "ruins of Gasaka." "Kisa" is the Berberine word for a ruin, plural "Kisaka[4]," so we can easily conjecture how the surveyor lit on his place-name "Gasaka." One is in the same trouble with the names of islands. It is

[1] "Uru" is a chief or head man in the Berberine tongue.

[2] *Travels in Nubia*, London, John Murray, 1822, pp. 74, 75.

[3] LEPSIUS, *Denkmäler*, Part I, Pl. 111.

[4] Is "Kisa" derived from Kinysa, a church? Most of the ruins we find are those of ancient churches.

a matter of common knowledge to those who make but a few investigations from Aswân southward that amongst the Barabra the word "Arti" signifies "an island," and yet we read "Hamanarti Island," "Kessewarti Island," "Gerrendnarti Island"; and as for identifying any one of these in the Second Cataract map with the names as told to me I was never successful.

A study of the map (Pl. XXIV) shows how the fortresses lie in relation one to another. I venture to think, as I have already said, that between Matûka (*E*) and the small fort *G* there may lie one or two others. There is almost certainly a ruined fort on one of the intermediate islands, but to make a proper archaeological survey of this part of the cataract would be quite a little expedition in itself. The absence of boats is alone a serious difficulty, not to mention the dangerously swift current, and the uncompromising lumps of rock on which the traveller's boat may come to grief. My efforts to visit a number of the islands have also failed because of deficiency of water.

The nearest forts to *A*, going southward, are on islands at *C* (Mayanarti) and *D* (Dorgaynarti)[1]. Both lie quite low down, but at *E* (Matûka) stands an imposing fortress high above the river on the rocky western bank[2]. From this place the river is well commanded both north and south, whilst a well-marked road passes close by on the west. On an island just below *E* is a large fortress, *F* (Dabnarti). Between *E* and *F* the river would, at this point, be well under observation.

Between *F* and *G* BURCKHARDT saw an island with a ruined castle on it, and gives the name as Escot; on the map of 1911 I find an island Askut. At *G* stands, on the west bank and in a very commanding position, a small fortress. At *H* is Uronarti or Gazîrat el-Malik[3] (Island of the King) with a fortress high on the top. At *I* and *K* are the very important fortresses of Semna el-Gharb and Semna el-Sharq. From *H* the points *I*, *K*, and *G* are well in sight, and if at Escot there be a fort it would probably be in easy signalling communication with *G* and so with *H*, *I*, and *K*.

In Fig. 3 of Pl. XXIV the part of the Nile from Semna to the northern extremity of the Gazîrat el-Malik is shown to a scale of $\frac{1}{5000}$. A study of this map demonstrates to us at once how remarkably well-adapted the position was for defensive works. The reef of rocks forming the rapids and the promontory of Semna el-Sharq are well brought out. At a very short distance to the north rapids exist on either side of the head of the island Kigingar, as I know to my cost, for I was nearly sucked over them by the stiff current. Rapids also occur a little way to the south of Semna.

## II. CHARACTERISTICS OF A FORTRESS.

From times, who can say how remote, the advantage of surrounding a fortress with a ditch (unless it could be placed on a more or less inaccessible peak) was realized. Many parts of Egypt are peculiarly unsuited to this method of defence: during several months of the year the ditch would be overflowing; during others it would be dry. The Egyptian did not, however, fail to make use of the dry ditch, as we shall see later.

[1] See pp. 164—165. [2] See pp. 165—166. [3] Also called Uronarti, as I am told.

Many fortresses in Egypt proper, as also in Nubia, were placed on the rocky or sandy surfaces lying just beyond the cultivated area, above which they are but a little raised. In such cases the constructors made use of the following expedient. Outside the main wall of the fortress, and at a short distance from it, a second and lesser wall was built; the enemy had first to break through this before he found himself in face of the inner and true wall. In the artificial ditch, for such it was, between the outer and inner wall the assailants would find themselves in a very awkward position, being exposed to a hail of missiles not only from the top of the inner wall but also, not improbably, from the top of the outer. On a comparatively small scale one of the best preserved fortresses of the double-walled type still exists at Hierakonpolis, which is assigned to a very early period[1]. The Shûnet el-Zabîb at Abydos is a larger example of the same scheme. At Ikkur (perhaps better known as Koshtemna) in Nubia (see Pl. XXV) is a ruined fort which shows very well the characteristics here referred to.

Ikkur is so valuable an example in fixing an approximate date that, although it is not within the confines of the Baṭn el-Ḥagar, the evidence it affords cannot be passed over. It was excavated by Dr G. REISNER and Mr C. M. FIRTH, and is described by them[2].

The reduced plan which I publish (Pl. XXV, Fig. 1) shows that on the same spot there are the remains of two fortresses, one standing in part over the other. The excavators were satisfied that the fortress printed solid black on my plan is the older, and this independently of the fact that it actually is, in places, buried beneath the walls of the later fort, which are in the plan scored with diagonal lines. "The inner and older wall," Mr FIRTH tells us, "is now destroyed to the floor level and is protected by round projecting bastions at intervals of about twenty metres. At the foot of the bastioned wall is a trench, the line of which follows the bastions. Both sides of this trench are faced with mud bricks and sloped towards the bottom of the ditch, which is therefore considerably wider at the top." The trench "had become filled at the time when the outer fort was constructed, as the later walls at two points are carried right across the sand-filled trench and on the N.E. side are built over the counter-scarps of the bastions." "The walls of this outer fort are in places still seven metres or more in height."

The later fortress, rectangular on plan, is not very correctly set out upon the ground, but we see from the remains that its characteristics were entirely those which we usually find in Egypt—a rectangle of thick walls and outside of it a ditch. In these fortresses the ditches must always have been dry, and unless carefully looked after must have rapidly filled with blown sand. Mr FIRTH gives his reasons for thinking that certain projections found on the walls of the northern ditch were intended for the base of a drawbridge.

We return to the earlier fortress. As his plan shows, a thin wall (everything is of brick) is built at the foot of the inner face of the great brick wall at a distance of 1·70 m. from it. We shall see at Matûka the same thing. What purpose did the narrow passage between the two walls serve?

[1] J. E. QUIBELL and F. W. GREEN, *Hierakonpolis*, Part II, London, Quaritch, 1902, Pl. 74 and p. 19.

[2] *The Archaeological Survey of Nubia*: *Report for* 1908–1909, Vol. I, pp. 22—25, and Vol. II, Pls. 33, 34, 35, 36.

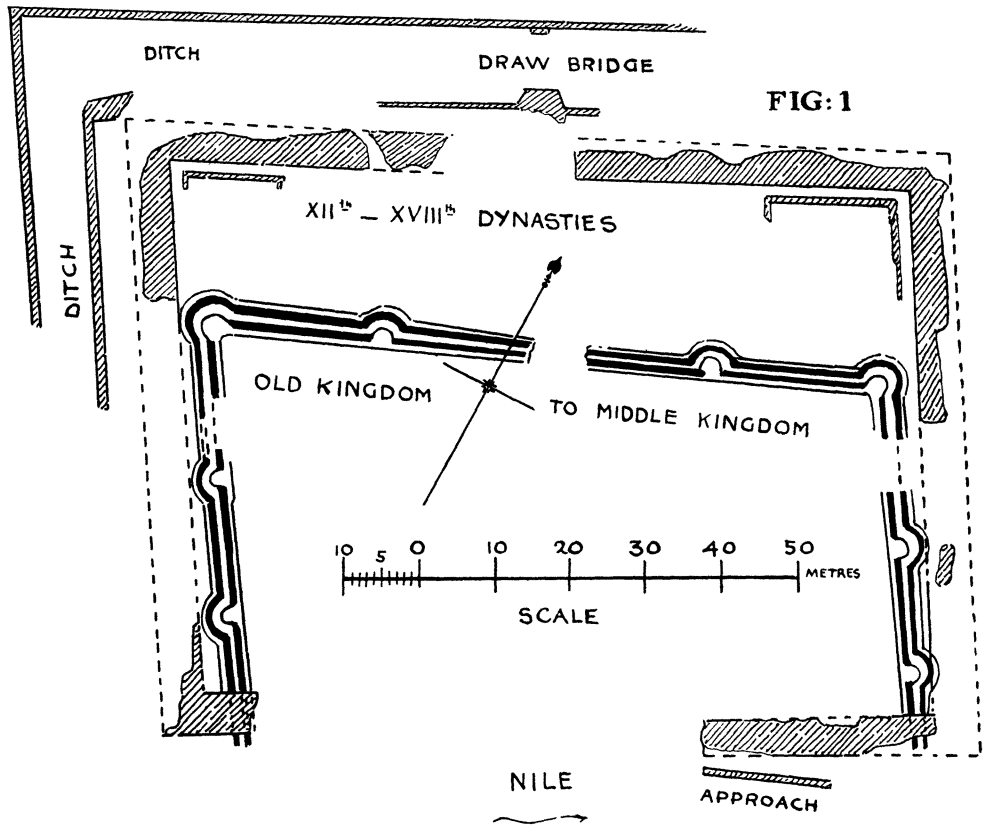



FIG: 1

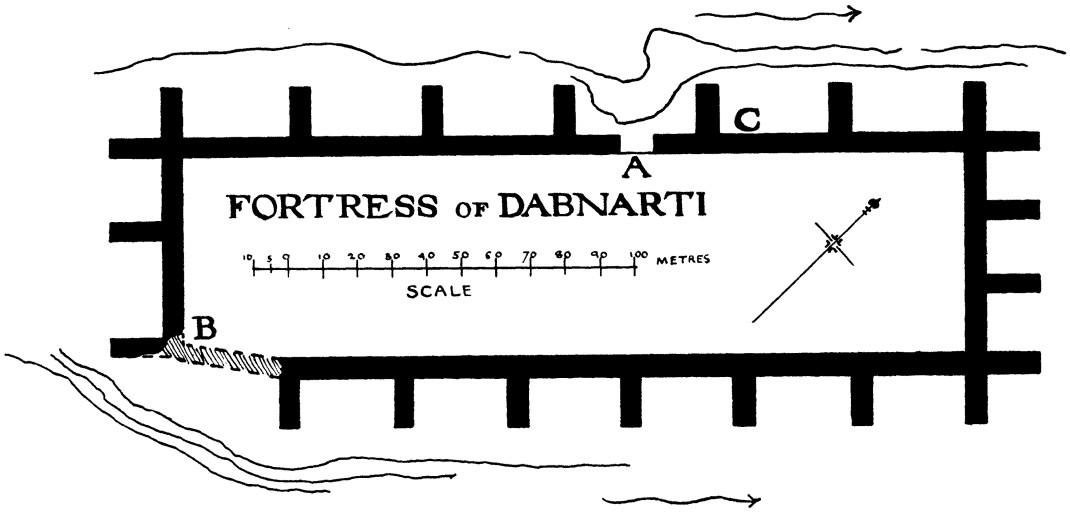
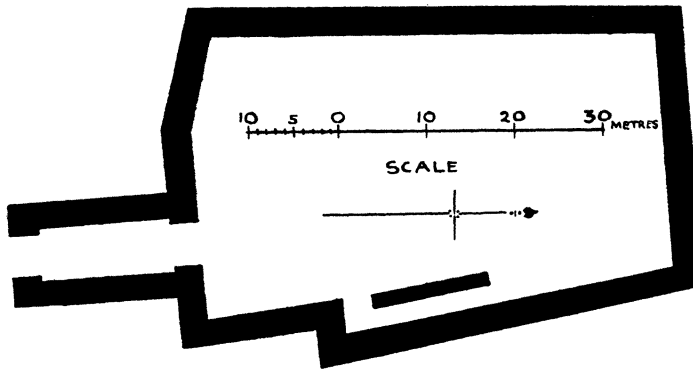



FIG: 2




SMALL FORTRESS OPPOSITE SIDE OF THE NILE TO SARRAS

FIG: 3

I visited and examined Ikkur in February, 1899. At that time, in the north-east corner between the Old Kingdom wall and that of the XIIth Dynasty there lay sundry pieces of stone columns, both drums and capitals. One stone was the lowest drum of a column of bulbous type; two stones formed part of a bell capital, all rather rough in execution and small in scale. Probably these stones have been stolen since I observed them; they lay on the surface, and Mr FIRTH does not mention them. They must have formed part of a temple for the use of the garrison, and this, as we shall presently find, was usual.

I have written at some length about the fortress at Ikkur because of its great value as evidence. So many ancient sites have been subjected to continuous occupation and the most drastic alterations or, still worse, have suffered at the hands of archaeologists of the old school, tumbling all things topsy-turvy in search of "objects" and paying no regard to the monuments themselves or the evidences of their history. Ikkur has had the good fortune to have been completely overlooked for centuries. When I first saw it in 1899 I do not think it had ever been investigated. Since then, Prof. GARSTANG has given it his attention and now Dr REISNER and Mr C. M. FIRTH, for whose excellent notes I am very grateful.

The chief peculiarity of the older fortress is that its bastions have, on plan, semicircular ends. For a reason yet to be explained the Egyptian architect eschewed any constructions which were not rectangular in plan. His megalithic system of building, clumsy and inelastic, did not lend itself to the employment of arches, nor was it easy to adapt the methods to curves of plan. These objections do not, however, hold good in dealing with brickwork, and yet, amongst the numerous and very large remains of brick structures in Egypt, it is difficult to recall any with curves in their plans excepting the fortress now under consideration and another, presently to be mentioned, near Bûhen, for which see Pl. XXVII.

On my visit to Ikkur in 1899, I took it for granted that the round-ended bastions, the foundations of which could clearly be traced, were the remains of a structure of Saracenic times. Both Roman and Mediaeval builders were much in favour of this form, but Dr REISNER and Mr FIRTH carry it back to the early Dynasties, and I do not for a moment question that they are right. Nor does it seem remarkable that examples of fortresses thus planned are rare. Their immense age and the fact that their materials could so easily be used over again for a later structure are more than enough to account for the disappearance of the most ancient examples.

## III. DESCRIPTION OF THE FORTRESSES IN THE SECOND CATARACT.

### BÛHEN (Pl. XXIV, *A* and *B*).

As the ancient Egyptians approached the enemies' country from the north, going up the Nile, it seems reasonable that we should do the same and begin our work at Bûhen, which lies on the west bank opposite the modern Wâdî Ḥalfa. That this place must have had considerable importance is proved by the ruins of temples we still see and by the antiquities that have been laid bare; also by sundry inscriptions. One of the temples was founded by Senusret I (XIIth Dyn.). There has been discovered a very elaborate system of fortification, partly cut in the rock, partly constructed of brick.

Part of this was first discovered by Capt. LYONS in 1892[1], and the whole was more completely investigated by Dr RANDALL-MACIVER in 1909–10[2]. Dr RANDALL-MACIVER gives a plan of the town of Bûhen (Vol. II, Plates; Plan G) and a description of the outer fortifications (Vol. I, Text; Chapter VII). I have taken the liberty of making a copy of the published plan, so far as is necessary for my purposes. See Pl. XXVI.

By a study of this it is easily seen on what scientific lines the fortification was laid out. The ground on which it stands is not level but rises westward from the borders of the Nile. At about 130 m. from the river bank, which is here somewhat steep, the alluvial soil, covered with sand, gives way to a slope of rock. The stout brick wall, with external buttresses along its face, was carried forward continuously, rising with the slope whether of rock or sand, then turned abruptly southward and then again east until it met the river bank. Outside the wall was a system of double walls. From the river edge as far as the rocky plateau a ditch in the sand was not a very practicable thing; but on arriving at the plateau, the rock was cut away and a ditch made. The thin walls carrying on the line of those on the lip of the rock ditch project northward close by the river bank. Here it is supposed there was a tower; another projection occurs further west with remains of a tower. Such projections occur all along the external protections of the wall, which itself does not show evidences of bastions or towers at each of these places.

The ditch "was cut down into the solid rock: it was six metres wide and three and a half metres deep, with sides that sloped steeply down to a flat bottom and were chiselled with remarkable smoothness and regularity. The low brick walls rose directly from the edge of the lips."

A gateway was traced at the river edge in the south wall, and another possibly in a similar position at the river edge of the north wall. The nature of the defences along the river edge could not be ascertained. The great wall had a thickness of 8·75 m. at its base, the buttresses projecting another 1·50 m. It is much to be regretted that Dr RANDALL-MACIVER did not give a sectional drawing of the wall and ditch.

Within the space enclosed by the walls above described are two temples. One, which is by far the larger, is attributed by Dr RANDALL-MACIVER to Queen Hatshepsut[3] but stands over the ruins of an older building of the XIIth Dynasty. To the north of this are the ruins of another temple attributed to Amenhotep II, which also stands over earlier buildings (see *A* and *B* on the plan, Pl. XXIV).

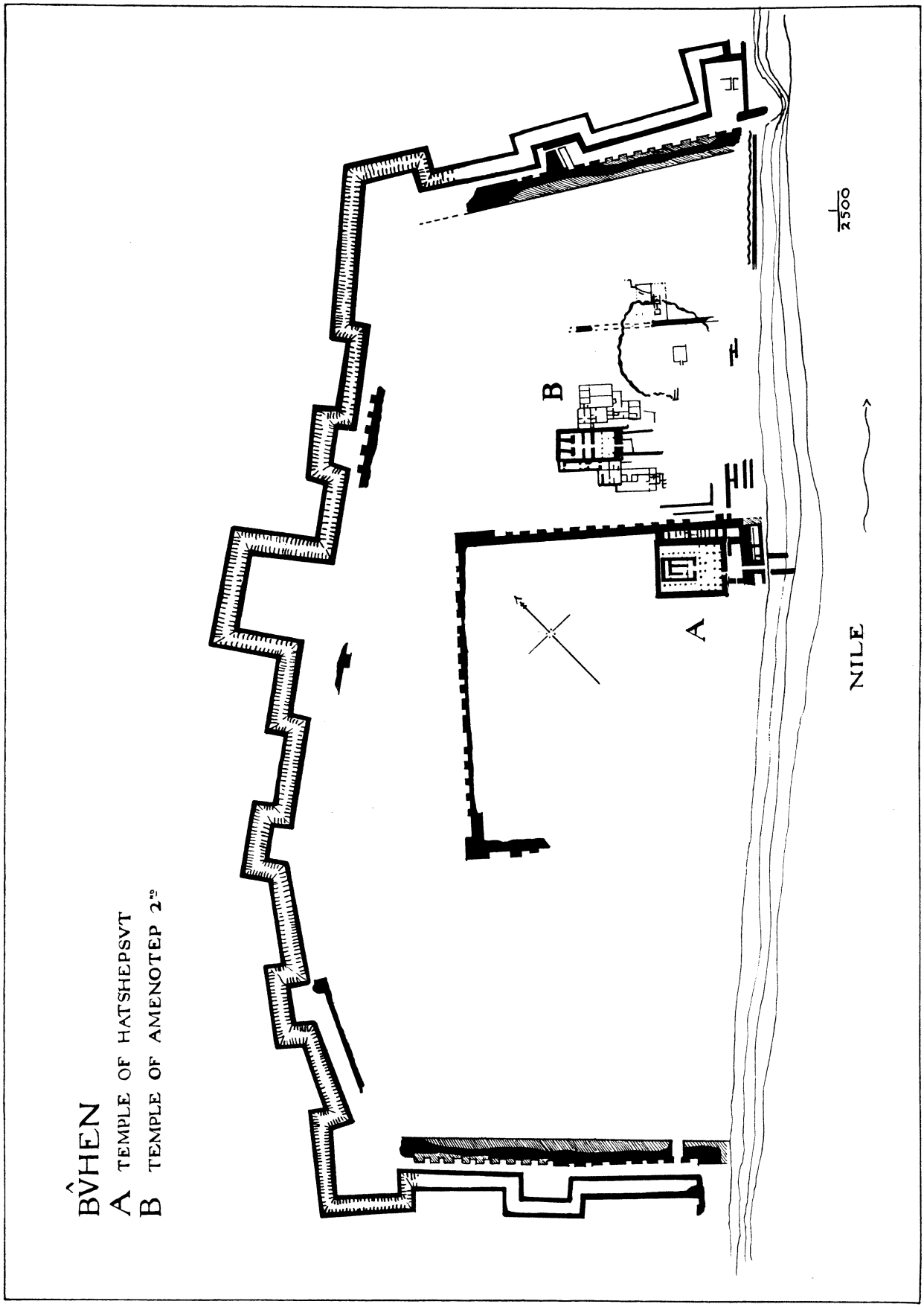
The temple of Hatshepsut stands in the corner of a rectangular enclosure formed by a stout brick wall with buttresses on the external face. Dr RANDALL-MACIVER found reason to believe that this enclosure was built in relation to the XIIth Dynasty temple before referred to, over which the temple *A* has been built. He considers that the more elaborately planned system of walls and ditches first described were laid out in the XVIIIth Dynasty. I venture to think that the reasons he gives for arriving at this verdict are not conclusive. As far as the knowledge and systems of defence are concerned, surely the scheme adopted may well be attributed to the XIIth Dynasty.

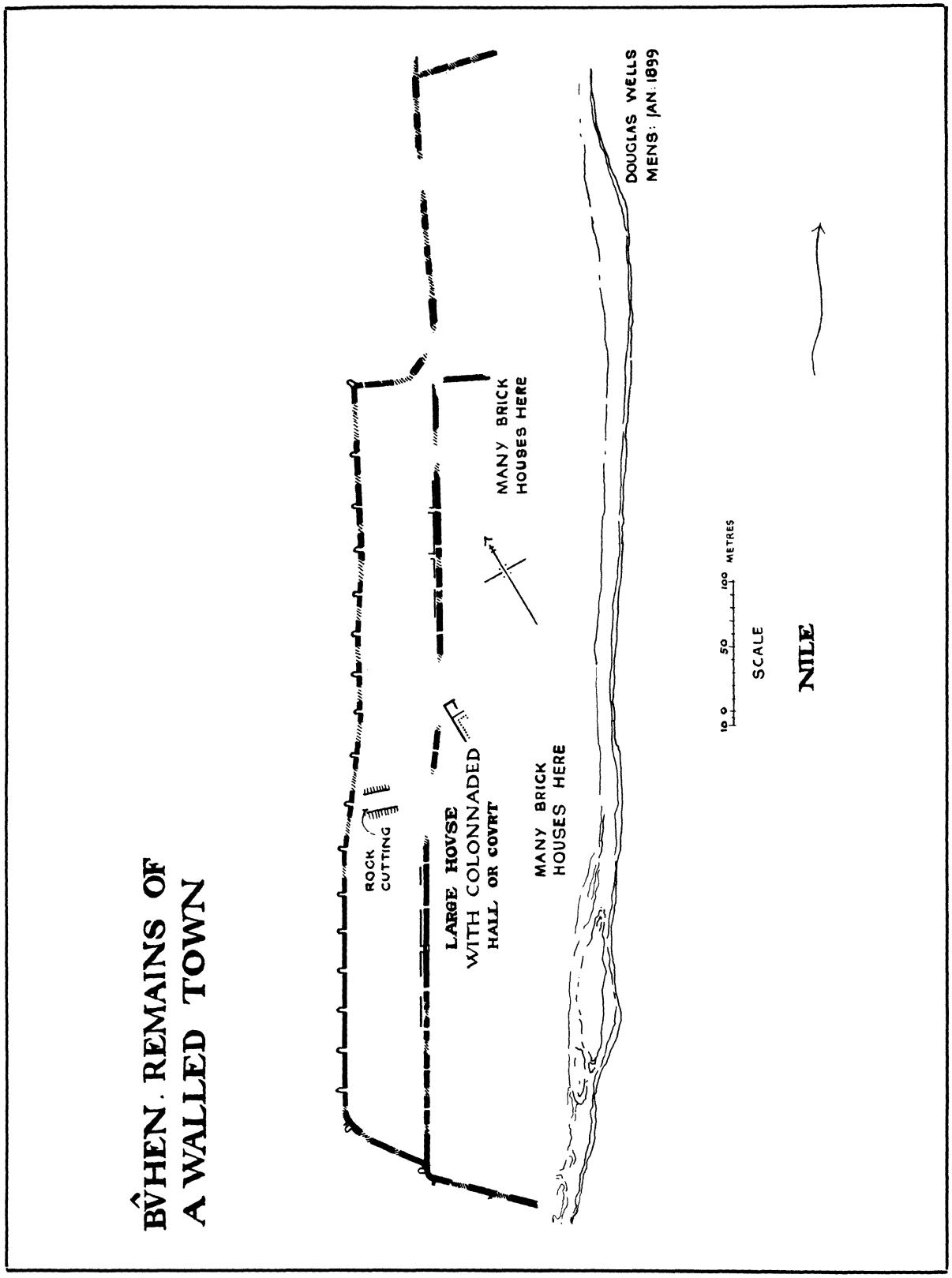
It is evident that the population of Bûhen was considerable. Great quantities of

[1] See E. A. W. BUDGE, *The Egyptian Sûdân*, Vol. I, p. 537.

[2] Dr D. RANDALL-MACIVER and LEONARD WOOLLEY, *Buhen*, University of Pennsylvania, 1911.

[3] Hitherto attributed to Thothmes III.





potsherds cover the surface of the river-bank both north and south of the fortress. I found considerable remains about a mile and a half south of the temple of Hatshepsut (Pl. XXVII). In January 1899 I observed by the side of the river a long line running parallel with the west bank of the Nile and slightly raised above the general surface of the sand[1]. A few excavations were made: these soon revealed a line of wall from which projected at intervals, towards the west, a series of bastions with semi-circular ends corresponding, as we now see, very exactly to the bastions at Ikkur. This wall is about 600 m. in length; from its western face there project at least eighteen bastions. Behind it, i.e. towards the Nile, are the remains of a second wall with traces of bastions also projecting towards the west. Thirteen were clearly traced, but there certainly were many more. This wall extends to a length of fully 1000 metres and returns at the north and south end towards the Nile, enclosing a long strip of land which it was evidently intended to protect against invasion from the side of the Libyan desert. Rubble stone is the material used for the work[2]. The bastions are not spaced with accuracy, but occur at intervals of about 30 metres. The main wall has a thickness of about 2·40 metres, but the wall of the bastions is only about 0·90 cm. thick. It is possible, indeed probable, that the wall resting on this stone work was of brick. In Nubia the sand, which is the degradation of the Nubian sandstone, is exceedingly coarse and angular in its grain. Much evidence could be given to show the powers of attrition this material possesses when driven forward for three or four thousand years always in the same direction. In the case of the ruin now under consideration the upper surface of such bricks as remain in position are scored by the moving grains of sand, which leave on them a series of parallel lines as though they had been scratched by a fine comb. This being the case, it may be supposed that there was more brickwork than we now find evidence of. Not only is the wall slowly ground down, but the materials of it are removed and scattered far away; within the space enclosed by the walls is a quantity of dry alluvium and also of broken brick.

The bricks found intact beneath the sand are all large (average $0{\cdot}32 \times 0{\cdot}15 \times 0{\cdot}08$ m.). Large bricks are always found as the remains of fortresses, temples, and public works. Small bricks, such as are used to-day, are found in the building of private tombs and small structures.

When we consider the walls I am now mentioning, we are forcibly reminded of those at Ikkur (see above, pp. 160—161). The conclusion arrived at in that case was that the fortress with rounded bastions dates from the Old Kingdom. Are we not then permitted to suppose, until further specific evidence is obtained, that the walls I have now been describing belong to the same period?

Protected by these walls I found the remains of what I take to be a house of some importance.

A little south of the place last described numerous islands are seen in the river, which increase in number until they considerably obstruct the flow of the water and form eddies and rapids. We enter upon the northern outlet of the Second Cataract. Several of these islands have on them remains of ancient buildings with massive walls

[1] See Pl. XXIV, at *B* in Figs. 1 and 2.

[2] We now see only the ground courses.

of brickwork. These are always built of large bricks, and upon them are imposed other structures with bricks of smaller size, evidently of later date.

### Mayanarti (Pl. XXIV, *C*).

At the southern end of this island is a large mass of crude brickwork, with remains of very many small vaulted rooms and passages. Pottery is found of both Christian and Arab times. The ancient place was probably used by Romans, by Christians, by Arabs, and in more recent times either by or against Derwishes.

I was enabled to give a more thorough examination to this island in Feb. 1916.

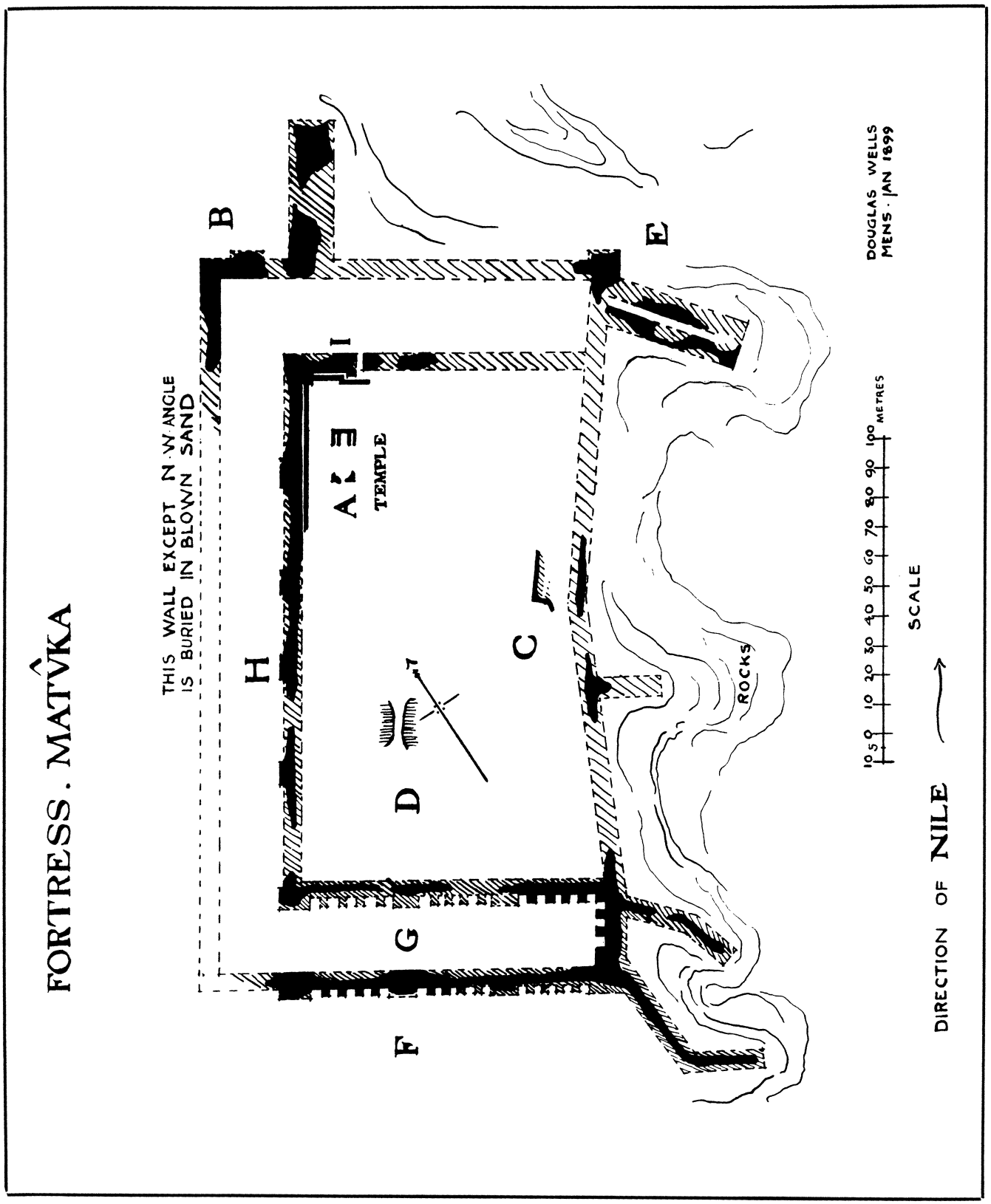
The brickwork above referred to is crowned by a platform, breast-walls, etc., now very much broken, constructed entirely of small bricks and very badly built. This was erected on the top of a mass of older building, and was made to receive a gun or two and act in concert with a fort on the east bank. The two commanded the approach towards the camp at Ḥalfa and were set up against the Derwishes. Small chambers round about were arranged for the accommodation of the garrison, and were mingled with rooms of older date connected with the fort on which the platform above mentioned had been imposed. It was evident that very much of the older work had been overthrown and levelled down to form a bed for the new.

Beneath this system of top works and the layer of ruins is seen a stratum of very large bricks much broken up. I have not elsewhere found any of like size; they are no less than 0·40 m. long and 0·20 m. wide, but with the thickness 0·05 or 0·06 m. of ordinary small bricks. Beneath these are found bricks of the same dimensions as in the buildings at Bûhen and presumably of the same period. These particulars are given to show that the island must, in early times as now, always have been considered a place of strategic importance. The pottery gives the same indications. In addition to fragments quite modern, there are pieces of the fine glazed and coloured ware of which so much has lately been found in the dust mounds south of Cairo. The place was clearly garrisoned by troops having commanders from Cairo, who were not content with unglazed ware. Much pottery of a fine quality and of an earlier type is also found, both Coptic and Roman. The island, which even within the memory of man has lost a considerable slice on its eastern side, is now almost uninhabited; but the ruins of many ancient houses testify to the great number of its earlier inhabitants. Clearing the sand from the buried houses would no doubt reveal much of interest and would open out some pages of its more remote history.

### Dorgaynarti (Pl. XXIV, *D*).

This island is about a mile south of the last. On it is a vast solid wall of crude brick. The fortress is elongated on plan, the length being from north to south, and the east and west sides being approximately parallel. The bricks vary much in size; some are more akin to tiles, 0·35 × 0·35 × 0·10 m., in other places the more usual dimensions, 0·32 × 0·15 × 0·08 or 0·10 m., are found.

Standing, as it does, on a base chiefly of hard alluvium but probably with rocks below, and the foot of the walls being but little above present high Nile, the water has disintegrated the lowest courses of the outer face, with the result that the mass of



the wall has now a tendency to sink outward, the outer skin falling off into the river. A revetment of rubble stones was provided to obviate a danger that was foreseen, use being made of the hard green rock which forms the material of most of the cataract. Loose stone of the same description was also thrown down to break the rush of the water. A small piece of cut stone lay within the circuit of the walls, part of a small cornice; there are, probably, more pieces to be found.

The brick walls are fully eight metres thick. In the west wall I observed the usual courses of timber bond built in irregularly. The dimensions of the fortress are roughly 194 m. from north to south, and 80 m. from east to west.

### The Fortress at the Mouth of the Wâdî Matûka (Pl. XXIV, *E*).

This very extensive work stands on the west side of the Nile upon the top of a rocky cliff, at an elevation of about 20 to 25 m. above the river.

When I first visited the place (Jan. 26th, 1894) my investigations were of a summary character, as we were beyond the Egyptian frontier and the Derwishes were active; on the occasion of my second visit (Jan. 8th, 1899), when I was accompanied by my friend Mr R. D. Wells, we had no such anxieties. We were then told that Matûka was the name of the district, and that the fortress itself was called Mûrgassi. Dr Budge informs us (*op. cit.* Vol. I, p. 549) that there is a Wâdî Ma'atûḳa, at the mouth of which the fortress stands.

A glance at the plan (Pl. XXVIII) shows that this fortress covers a considerable area of ground and was carefully laid out for defensive purposes, full advantage being taken of the site. The total length of the fortress from north to south, including the north bastion, is about 295 metres, and the width over all from east to west is about 190 metres. The space enclosed by the inner walls is about 175 metres by 100 metres.

On the western side of the site, the Nile flows below a series of rocky cliffs, which are broken into by the mouths of lateral gullies. The floors of these gullies rise rapidly, and at a comparatively short distance inland lose themselves in a range of rock-hills mostly covered with sand. These hills form a fairly even place for a track running from south to north; and a more beaten track lies below on the Nile bank. The site selected has one of the gullies lying to the north of it, and a lesser gully to the south. By the choice of this position the strength of the north and south walls is not a little assisted, whilst towards the east we find the rocky cliffs above referred to, with the Nile quite near their foot.

It will be observed that the above-described (p. 160) system of double walls forming a dry ditch is here carried out to a grand scale on the north, south, and west sides; there is no need for it on the east. It is clear that the designers of the fortress realized how objectionable it was that the enemy should find lodgment on any place level with the base of the walls. The very massive bastion *B*, which stands forward some 47 m. from the wall-face on the north, and is 16 m. thick, not only occupies the summit of a piece of rock that might be a place of lodgment for the enemy, but also commands the gully which we may almost certainly regard as the approach from the river. It also seems possible that the entrance to the fortress through the outer wall was defended by the bastion.

A study of the plans of the two fortresses at Semna will show that in those places advantage was taken of pieces of rock in the same way as we see done here. An objectionable spur of rock at the north-east angle is similarly covered by a bastion (*E*). The wall here is double; whether this indicates the beginning of a covered way, by which the river could be approached and water for the garrison procured, I cannot venture to say. Many questions present themselves for solution, the answers to which could be obtained only by careful and scientific investigation assisted by spade work.

At the south-east angle of the fortress there are two bastion or spur walls, shaped in plan so as to cover the surfaces of the two shoulders of rock on which they are planted.

Very much of the timber bond in this part of the fortress is in an extraordinarily good state of preservation; pieces stick out from the wall-face 30 or 40 cm. long, both sound and hard. The friction of wind and sand has worn away the brickwork and left the timber but little affected.

The inner and outer walls (*F*, *G*), forming the enclosure of the fortress on the south, show a peculiarity of construction. As we see by the plan, the southern faces of the two walls and the west face of the east wall are divided by piers into a series of recesses. Had the recesses been found only towards the interior of the space enclosed by the walls, it might have been supposed that they had to do with an economy of material; but they also occur on the outside of the southern wall, in a place where they would be an actual source of weakness, since an assailant working at a mine within the recess would be a good deal protected from the attack of soldiers on the wall-top. The recesses do not at all suggest the ornamental panelling we find on sundry mastabas. There are some indications of pilasters on the outer face of the inner west wall (*H*). An examination of the plan of the fortress at Bûhen (Pl. XXVI) shows that the system of piers external to the walls was largely made use of, not only in connection with the walls forming the rectangular enclosure surrounding the temple of Hatshepsut, but also in connection with the more complex outer walls. Up to the present, I am not able to point to this peculiarity of construction in any other part of Egypt, but the spade, which has done so much for us in this venerable country, may yet reveal similar examples elsewhere. The outer western wall is nearly buried in blown sand.

Where was the entrance to the fortress? It seems almost certain that it must have been through the north wall protected by the very massive bastion. There is, now, an opening in the north outer wall at this place. At *I* is a narrow way through the inner wall; no other indications of a doorway were observed. As at Ikkur, so here traces of a thin wall can be seen inside the inner north and west walls, and at a very short distance from its base. This wall, oddly enough, is carried across the doorway; it seemed to end where shown on the plan, as if the object had been to intercept direct entrance to the interior of the fortress. Remains are seen of a small temple, first cleared by Capt. LYONS in 1892 (*A*)[1]. It was built by Senusret III, and was a construction chiefly in brick, with stone used for a few walls and doorways. At the present time it is, for the most part, almost levelled with the ground.

The rock rises slightly within the area enclosed by the fortress walls and has, in a place indicated on the plan by the letter *D*, been cut through, leaving a shallow trench. What purpose did this trench serve?

[1] See the brief account, with plan, contributed by Major LYONS below pp. 182–3.—ED.

## Dabnarti (Pl. XXIV, *F*).

Almost opposite to Matûka, to the east, lies the island called Dabnarti[1]. It consists of a narrow ridge, its length north and south rising in the manner of a hog's back. So far as could be seen amidst the labyrinthine water-ways which here press between a crowd of rocks, the best channels were those that pass this island. The fortress of Matûka and that upon Dabnarti would thus really command the river. It must not be forgotten how great a difference in level there is between the heights of a high and of a low Nile, some 26 feet or more. The observer must, therefore, be careful to state the month in which he makes his visit to the different places described by him. Under one set of conditions an island may be reached dry-shod or by a little wading, while at another time there may be a swift and dangerous stream either dashing amongst the rocks, or, what is perhaps yet more risky, just hiding them.

When I visited the place in the month of December 1909, the Nile being more or less normal, the current was very swift, and with the clumsy boat at our command the approach to the island was not a very easy business.

On the hog's back afore-mentioned is built the fortress (Pl. XXV, Fig. 2), forming an approximately rectangular enclosure about 59 m. wide and 227 m. long. The walls are for the most part built of crude brick, but where the ground slopes quickly towards the water, as it does in some places, a basement is prepared of the hard green stone which forms the material of this island, as well as of most other rocks in the cataract; the stone is laid dry, and without mortar. The plan, it will be observed, is very simple, consisting of straight walls with spur walls at right angles. The fortress covers almost all the available surface of the island. The walls are a good deal broken towards the top; what may have been their original height it is not possible to say.

The entrance was on the west side (*A*), the water swirling past with great vigour even at the time of my visit. An inclined way rises from the north and from the south, meeting at a gap in the wall, but the gateway itself has entirely disappeared. The entrance is placed in an extraordinary position as regards the water. The most energetic of all the rapids near about begins at this very place. A boat missing the little landing place would be sucked northward at once and be broken against the many rocks.

The space within the walls is devoid of any signs of occupation, and there are no indications of huts or houses, though excavation might reveal something. At the south-east angle (*B* on plan) the bricks of the wall have completely disappeared, a fact which may be attributed rather to erosion by the wind than to human violence; for the rock at this point rises so steeply from the river that no ascent could be effected here.

The spur *C* has on its walls, built double with a space of about one metre between them, a species of cellular construction. Can these be the lowest courses of little chambers for guards who could hence throw missiles on persons approaching the entrance by the inclined way? From the north-east angle are indications of a way down to the river, which was doubtless used in fetching water.

[1] In *Murray's Guide*, ed. 1910, p. 544, this island is called Tabaï; *Baedeker*, English ed., 1914, writes the name Dabeh.

### Fort opposite Sarras (Pl. XXIV, *G*).

This fort (Pl. XXV, Fig. 3) occupies a very commanding position on the summit of a rocky eminence, with a comprehensive view up and down the river[1].

The descent towards the Nile on the east is very rapid, and the approach from the north and west is steep and covered with deep sand; from the south the approach is not much better.

Compared with Matûka or Dabnarti the dimensions are small, 77 m. × 41 m. The entrance is well preserved, and consists of thick walls advanced from the main body of the fort. It would have been easy to cover this with a flat timber roof through which an enemy could have been assailed, but the walls do not now stand sufficiently high to indicate the way in which their tops were finished. The piece of wall standing parallel with the eastern wall may have assisted to support a stairway giving access to the wall-tops, but no marks of steps were observed.

### Gazîrat el-Malik (Pl. XXIV, *H*).

This is an island of some size with a hill in the midst. The commanding position of the island in relation to the river at this point and the fine outlook given by the hill doubtless induced the Egyptians to establish on it one of the chain of fortresses we are now considering. I regret that I was not myself able to land on this island; so I depend on the descriptions given by Dr Budge[2] and by my friend Mr R. D. Wells[3], who accompanied me on my visit to Baṭn el-Ḥagar and to whose kindly and untiring assistance I am greatly indebted.

Dr Budge tells us that on the hill there are the remains of a large fortress with mud-brick walls of enormous thickness and strength. I wish Dr Budge had been just a little more technical! He found a small temple within the fortress and some antiquities of great interest, all of which he describes—but these are out of my province.

As we were not able to make careful measurements, I think it is as well to say no more about this place but to move southward to Semna.

It would seem not improbable that the very considerable number of fortified places established in the comparatively short distance between Bûhen and Semna may have been due to the fact that, under many if not most conditions of the Nile, water communication between them must have been difficult. Each fortress would have to be more or less self-contained, and capable of, at least, some independence of action.

[1] This is probably the place described by Baedeker, English edition, 1914, as follows: "We regain the river opposite *Sarras*. Numerous rocky islets interrupt the stream; on one of these, to the S., are the ruins of an Arab castle, perched upon a rock. Alternately skirting the river and traversing the desert for another hour, we next reach *Shalfak*, with a well-preserved fortress of the Middle Kingdom."—Ed.

[2] *The Egyptian Sûdân*, Vol. I, p. 488.

[3] See *A note on the Fortress of Gazîrat el-Malik*, by R. Douglas Wells, below pp. 180–1.—Ed.

### THE FORTRESSES OF SEMNA: SEMNA EL-GHARB (Pl. XXIV, *I*).

Whilst the fortresses already mentioned seem to have escaped general observation, and have not, so far as I know, received even the far too cursory examination I have been able to give to them, the two fortresses at Semna have been visited on sundry occasions, and notes upon them will be found in the works of BURCKHARDT, LEPSIUS, HOSKINS, DE VOGUÉ, BUDGE, and others. LEPSIUS gives a small-scale map of the district on which the fortresses are depicted, though not very correctly[1]. The extraordinary flights of the imagination offered for our acceptation by PERROT and CHIPIEZ[2] stand in no need of criticism; and it is hoped that the drawings which accompany this paper, imperfect as they are, will support me in this assertion.

The Nile here cuts its way through a reef of hard rock, and is more constricted than at any other part of the Second Cataract. When I first visited the place at the end of December, 1898, the bulk of the river was observed to force its way with much noise and a descent of several metres through three more or less narrow passages. The stream passing at this time along the western shore, above which stands the larger of the two fortresses, was quite insignificant; but through the easternmost of the three passages the water was pouring with great violence. Beside the last-named water-way stands the eastern fort, which LEPSIUS called Kummeh, but which the people of the place told me was known to them as Semna el-Sharq, i.e. Eastern Semna; the rock-inscriptions are engraved on the east side of this passage.

Dr BALL, of the Egyptian Government's Geological Survey, has published[3] a more careful account of the cataract at this spot than had been given by any previous investigator, accompanied by a map of the district and a section through the line of reef forming the barrier. He visited Semna in March 1902, when the Nile was nearly at its lowest, and then found the whole body of the stream passing through a single opening in the reef somewhat nearer to the eastern than to the western fortress; his longitudinal section makes it clear, by the depth of the channels, that the greatest volume of water passes through the central and eastern channels, as indeed was the case when I visited the place in December 1898. Dr BALL confirms my view, based on the assumption that the water rose to the level of the highest inscriptions, that at the time of high Nile the fortress of Semna el-Sharq would become an island for a short period in each season. The fortresses were doubtless placed where they are in order to control the river throughout the whole year; but it is obvious that, then as now, the condition of the water-way when the river was in flood differed considerably from its condition at the time of low Nile. I do not think that any evidence exists to show that the level of the river has changed much, if at all, below the cataract at Semna, or indeed anywhere between this and the First Cataract. If, however, the highest water-level above the cataract at Semna stood seven metres higher than it

[1] LEPSIUS, *Denkmäler*, Part I, Pl. 111.

[2] PERROT and CHIPIEZ, *A history of Art in Ancient Egypt*, translated by Walter ARMSTRONG, Vol. II, Fig. 30.

[3] JOHN BALL, *The Semna Cataract or Rapid of the Nile; a study in river erosion*, in the *Quarterly Journal of the Geological Society*, Vol. LIX, February, 1903.

does at the present day there must have been a formidable waterfall at this point during many months of the year, the descent being so abrupt that no boats could have passed either upstream or downstream.

During part of the year the duty of the garrisons would, we might think, have been rather to guard the way by land than that by water. The inscriptions at Sehêl, however, must be taken to indicate that the passage by water was that most closely watched; and Pl. XXIV will show that the fortresses here discussed were meant to hold command of the river rather than of any roadway. The ancient road can be traced fairly easily, and by no means always follows the river edge; it very naturally avoids bends in the river and the unnecessary climbing of eminences. In some cases the road is not even in view of a fortress.

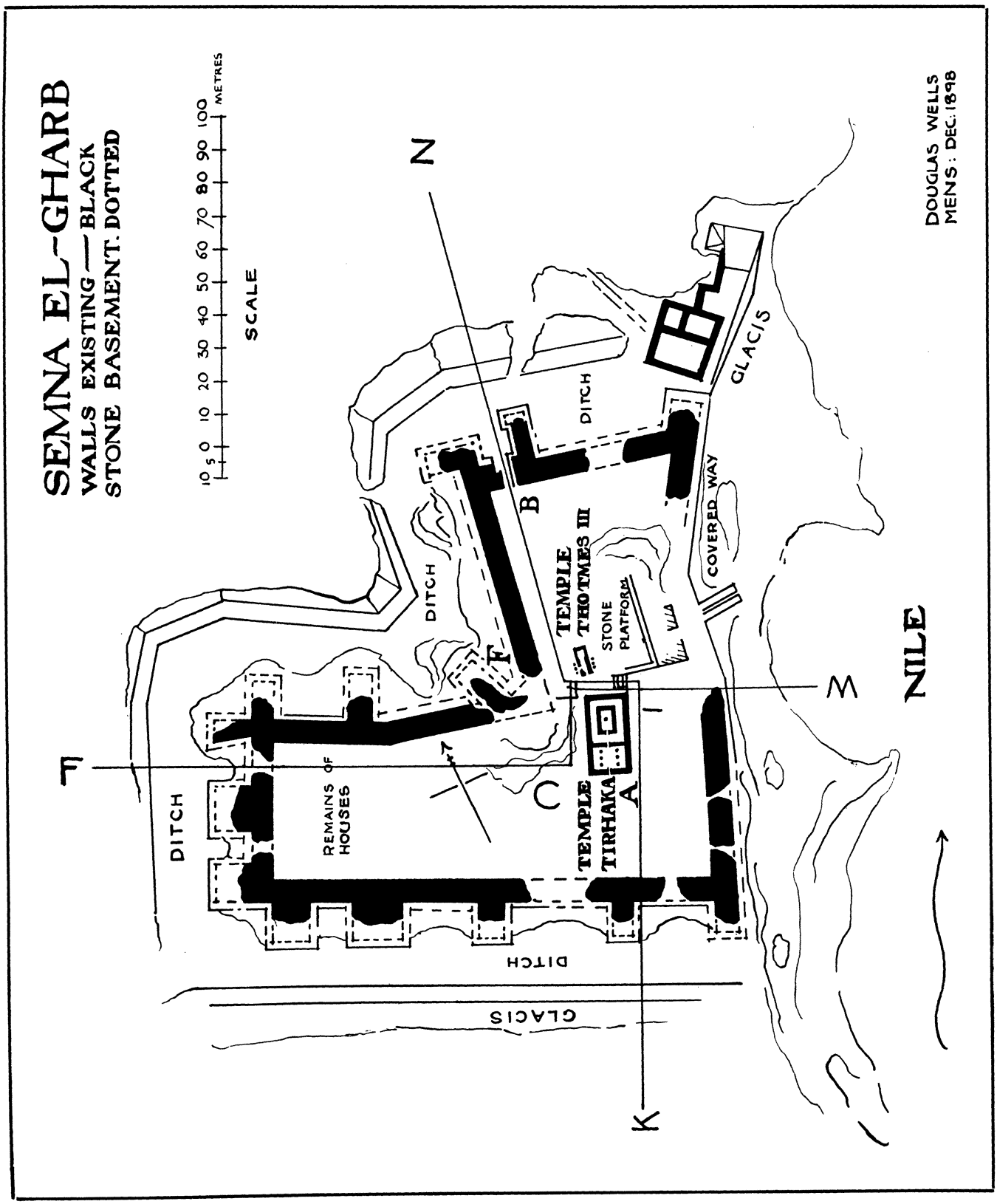
The movement of hostile bodies had but just come to an end when I visited the Second Cataract in the December of 1898; the army of the Khalîfa was defeated on September 2nd of the same year. The forces of the enemy did not follow the river bend, but kept a little way inland with the intention of escaping observation. Similar conditions must have prevailed in the XIIth Dynasty; but in no case could any number of people be moved and remain at a distance from the river, for in the desert is certain death.

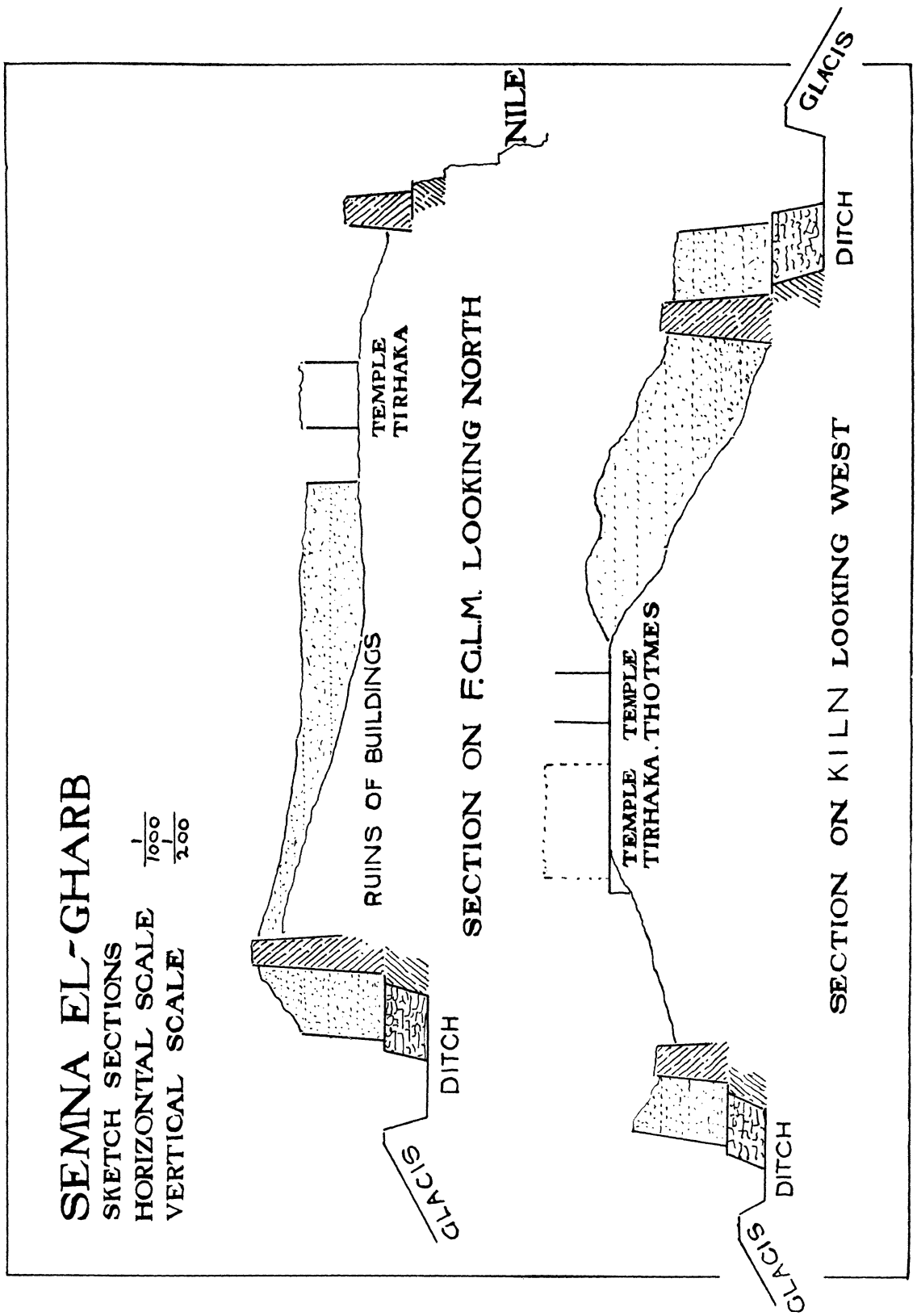
It will be well first to describe the greater fortress (Pls. XXIX—XXXI), which is really a most remarkable structure. There is nothing like it either in Egypt or in Nubia. The place it was to occupy was clearly suggested by the presence of the reef of rock. The position of the walls having been decided upon, a basement was prepared of the hard gneiss found in the neighbourhood. The stone cleaves naturally into more or less rectangular fragments, so that but little labour was required to make it take its place in the dry masonry of which the basement was formed. Even towards the river where there is a steep bank of rock a good deal of "making up" was done to level the surface for the reception of the brick walls.

A broad ditch was provided outside the basement, somewhat irregular in its width but extending on an average 26 metres from the wall-face (see the sections, Pl. XXX). The bastions projected into the ditch. The face of the ditch farthest from the wall is revetted with dry masonry; beyond it is a sloping glacis having its surface laid at an angle of about 60° with the horizon. The very extensive area of stonework is carefully laid, the stones being quite neatly and smoothly fitted to one another. The slope was evidently determined with regard to the top of the great wall, so that missiles projected thence would completely command the surface.

What the western fortress lacked in natural strength of position was made up for by art. However, advantage was taken of a knoll of rock at the eastern end of a hill that runs forward towards the river with a valley on its north side and a narrower valley on the south; these valleys slope gently towards the river. The neck of rock immediately west of the fortress has been cut through by a wide ditch, and thus isolation is secured on all sides.

The plan (Pl. XXIX) shows that in the laying out every effort was made completely to cover the summit of the eminence on which the fortress stands, thus leaving no place on which an enemy could lodge himself and sap the base of the walls. The plan is roughly that of the letter L, the limbs being about equal in length. The ground enclosed by the walls is far from level, falling rather rapidly towards south





and north, but rising towards the west. The temple stands on a platform that is partly artificial.

The great enclosing walls are built on a base of masonry consisting of the hard green gneiss before described, laid dry without any kind of mortar. The thickness of the brick walls where they rest on the masonry varies from 6 to 8 metres, but the sides show a batter as they rise. The spur walls or bastions are in many cases much thicker than the main walls, their increase of substance being regulated by the space available.

The sections of Pl. XXX should be studied, in order that the skill with which the site was prepared may be fully realized; they are drawn to a scale of five vertically to one horizontally. Without such exaggeration in the vertical direction it would be difficult to realize the values in a diagram on so small a scale. The section on the line *K*, *I*, *L*, *N* from south to north passes by the temples of Tirhaka (*A*) and of Thothmes III, resting, as we have previously seen, upon a partly artificial platform[1]. The rock descends very rapidly towards the north, where we soon reach the brick enclosure wall standing on the masonry base, the broad ditch into which the bastions project, the counterscarp, and finally the glacis. Going southward from the temple platform we descend less sharply than towards the north, and find the wall, ditch, and glacis as before.

The section on *F*, *G*, *L*, *M* follows a line from west to east. We first find the glacis and the ditch which cuts off the fortress from the hill on the west, and then the great wall; within the latter are the remains of buildings. The line next passes between the temples of Tirhaka and Thothmes III until it reaches the wall that stands on the low cliff overhanging the Nile.

I ask the reader to understand that these sections are not made from a series of accurate levels, but were built up on the spot from rough notes and have no pretension to be more than sketch sections.

Some slight excavations were made at *B* and at *F* in the hope of establishing the position of the entrance of the fortress, but were unsuccessful. The re-entering angle *F* appears to be a place that would have been easy to defend, the enemy being subjected to assault from the walls on either hand. But this holds good also of an entrance at *B*. As we may presume that the attacking forces would approach from the south, it would seem reasonable that the entrance should be towards the north, from which quarter the Egyptian troops and supplies would arrive.

The bird's-eye view (Pl. XXXI), based as it is on the plan, does not pretend to do more than give a general idea of the place. It is probably more easy for most persons to understand than the more technical drawings. It does not claim to show the fortress as it was at any given moment; and we do not know how high the walls stood. It is by no means impossible that they may have been somewhat higher at one point than at another. There is no evidence to show how the walls were finished at the top; nor can the nature of the small outbuilding by the river side at the

[1] A plan of the brick temple of Tirhaka, with photographs and description, is to be found in Dr BUDGE's work, *The Egyptian Sûdân*, Vol. I, pp. 481—488. A plan of the temple of Thothmes III occurs *op. cit.*, p. 587, with a description of the reliefs on the walls; it is on the walls of the latter temple that Thothmes III commemorates his ancestor Senusret III. See too LEPSIUS, *Denkmäler*, *Textband* V, pp. 190—202, where references to the plates in the main work are given.—ED.

north-east angle be determined[1]. In the bird's-eye view the site of the later temple of Tirhaka is indicated by the letter *A*.

No means of access to the wall-tops can be traced; but one is justified in supposing that in the case of so irregular a structure there must have been ramps or stairs in several places. I could not observe any small doorway or passage through the eastern wall giving access to the covered way that led to the river.

This covered way (Pl. XXXI, *C*) is a purely artificial work consisting of powerful masonry. The roof is of thick heavy slabs, and the walls and floor are of solid construction, far more firm and resistant than the covered way at Semna el-Sharq hereafter to be described. The covered way is at a lower level than any part of the fortress itself and could not have been of use for defensive purposes.

At this point it may be well to call attention to a very remarkable statement made by the writer of MURRAY'S *Handbook for Egypt*, edition of 1907. He tells us that the fortress of Semna stands about 300 ft. above the river, and that Kumma (Semna el-Sharq) is some 400 ft. above the river[2]. The base of the walls at Semna el-Sharq is about 18 metres above high Nile; at Semna el-Gharb it is about 14 metres. These measurements are given by Dr BALL in his section through the cataract from east to west. More will be said concerning the relation of the fortresses to the level of the Nile waters when I come to deal with the ancient inscriptions first observed by LEPSIUS.

South of the fortress of Semna el-Gharb the rocky hills retire somewhat from the Nile bank. There is a comparatively level space, on which a few trees are seen and which has evidently been inhabited and cultivated. Great quantities of broken pottery strew the ground. The ruins of a rectangular building are here to be seen, each side about 44 metres in length and with walls of considerable thickness. The bricks are all large, measuring 0·30 × 0·13 × 0·08 m., and are made without chaff (*tibn*). Small timber bonds are inserted at random both transversely and longitudinally. The courses of brickwork are horizontal. All the constructional evidence, in fact, favours a high antiquity for this building.

### SEMNA EL-SHARQ OR KUMMA (Pl. XXIV, *K*).

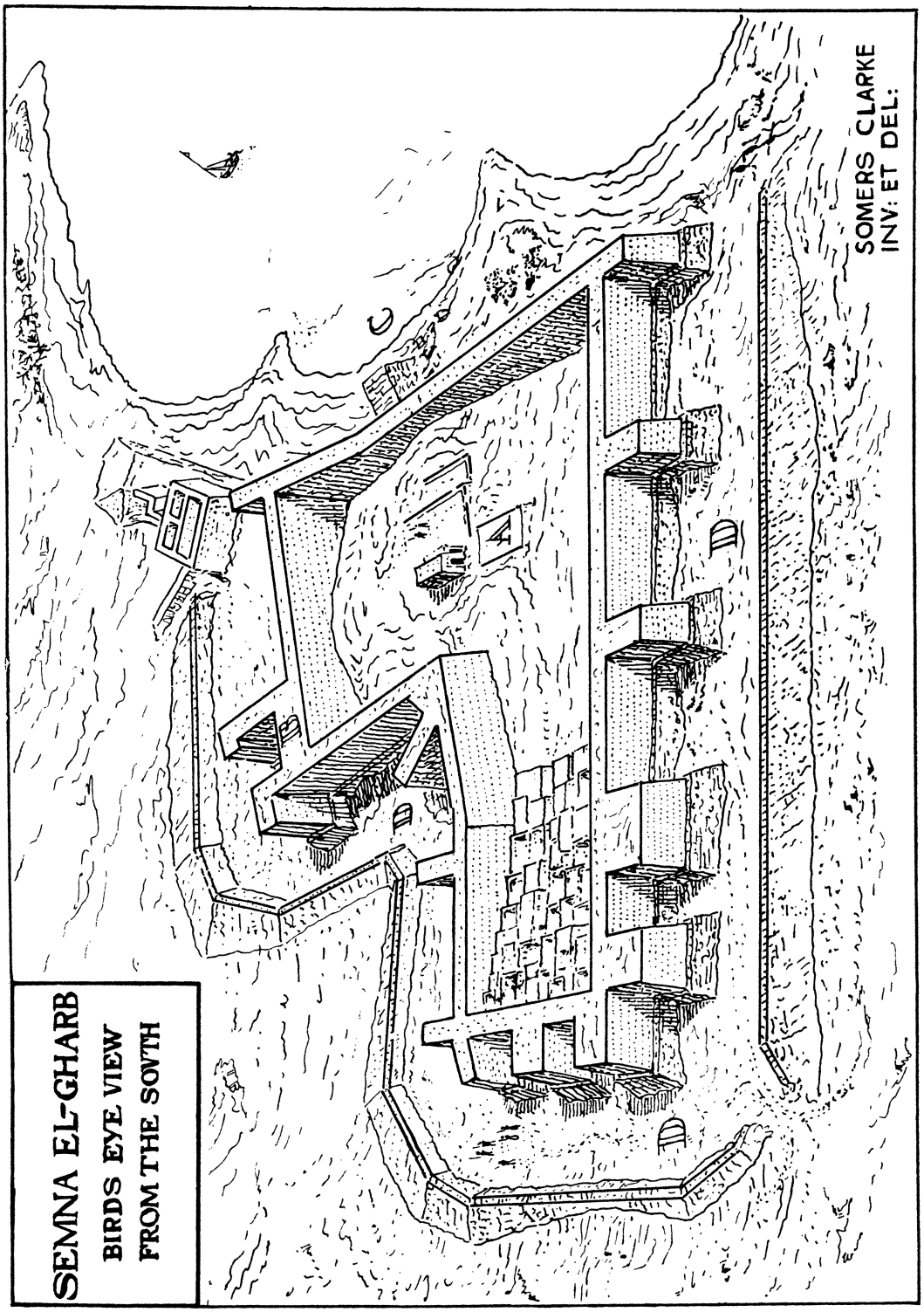
The position of this fortress in relation to the cataract of Semna is well shown in LEPSIUS' map, which is partly copied in Dr BUDGE'S book (*op. cit.*, Vol. I, Pl. opposite p. 588).

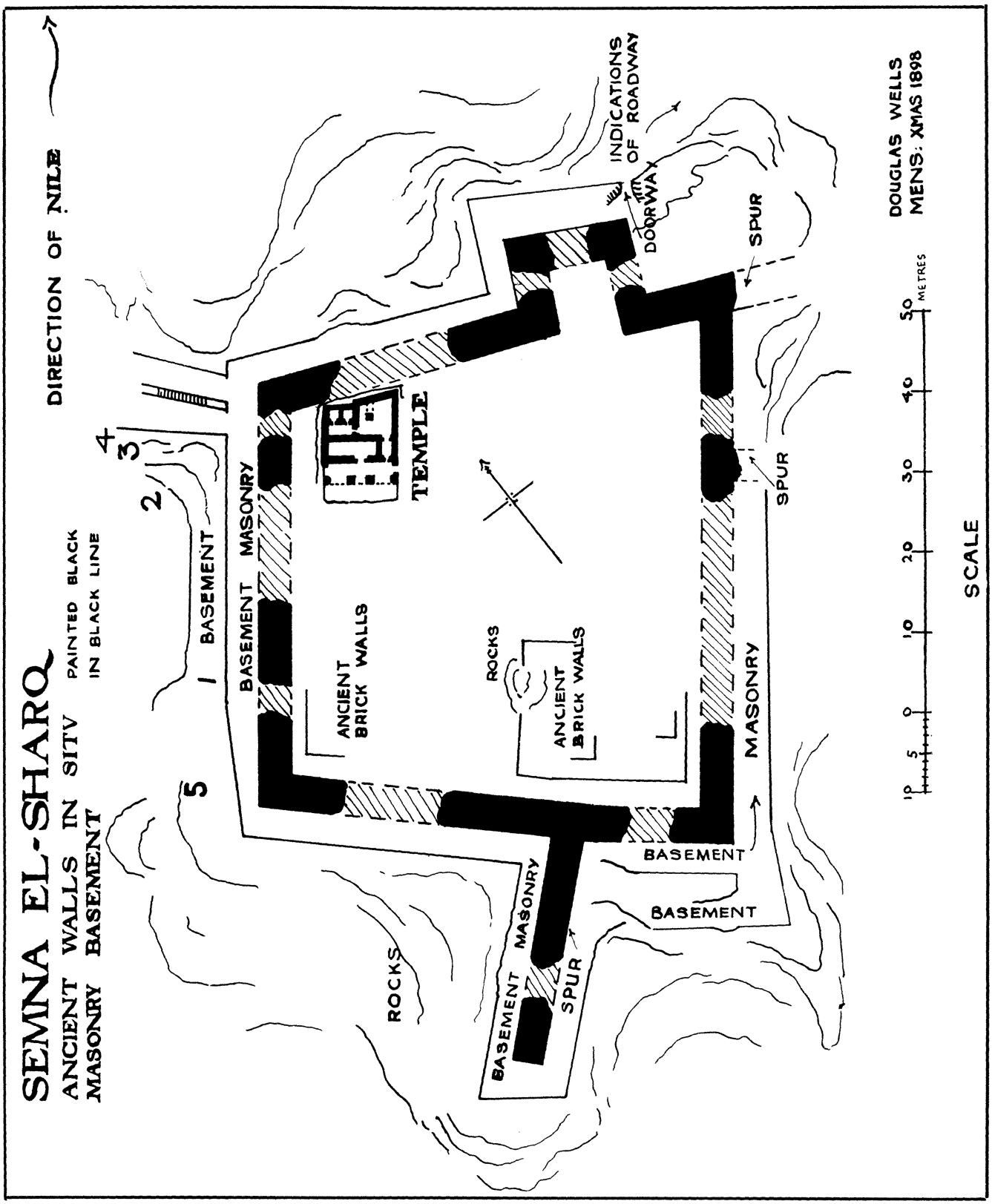
It will be observed that the plan of this fortress (Pl. XXXII) differs materially from that of Semna el-Gharb, to which, moreover, it is much inferior in size. Whereas the extreme length at Semna el-Gharb is about 230 metres from north to south and 180 metres from east to west including the glacis, the extreme measurements at Semna el-Sharq are 117 metres from north to south and 70 from east to west; in this statement it is assumed that the course of the Nile gives the direction north and south.

The fortress stands at the extreme end of a rock that is part of the reef running

[1] In the plan of Bûhen (Pl. XXVI) may be seen a similar outbuilding at the north-east angle; this Dr RANDALL-MACIVER suggests may be a tower for defending the ditch and outer walls.

[2] Dr BUDGE (*op. cit.*, Vol. II, p. 370) tells us that the temples in the two fortresses are "perched on the top of rocks 400 feet high." And yet he had visited the place!





across the Nile. The axis of the reef may be described as lying north-west and south-east; in cutting through it the Nile pours down its waters with great violence just below the western wall of the fortress. The rock on which this stands is cut off from the mass of the *gebel* behind it to the east by a narrow gully, through which a road, still clearly to be traced, passes along the eastern side of the fortress. As one ascends this road from the north a branch road is seen near the highest point trending towards the west and leading to the castle gate. The rock bearing the fortress is fairly level at the top, but this natural condition has been not a little assisted by art. On the south side the rock is steep, especially as it approaches the river; both at the south-west and at the south-east angles walls of large stones were built as substructures. On the west, the face overhanging the river is very steep, indeed almost vertical in places; scattered about on this western front are most of the inscriptions giving the levels of high Niles in the XIIth Dynasty. The water flowing past this face more nearly resembled a waterfall in the month of December 1898 than that of any other of the branches lying between the two fortresses. The current flows swiftly and smoothly until the north end of the narrow channel is almost reached, when it drops suddenly in a mass, roaring vigorously as it battles its way along. Towards the north the fortress-rock presents quite an easy slope, always rocky but without steep or difficult places.

The above description will suffice to indicate the natural strength of the position. Although it was commanded by the ridge on the east this was far enough removed not to constitute a menace. On this ridge is a spot that seems to have been utilized as an outlook. Southward from the fortress a good view up the river is obtained, and similarly towards the north the view is unobstructed for a long distance. The scene is one of the most utterly rugged desolation, with only here and there a few patches of green close by the river side.

The fortress makes use of all the available area at the top of the rock by means of a basement of dry-laid stones similar to the basement at Semna el-Gharb already described. The stone substructure on which the brick walls rest is considerably wider in proportion to these than at Semna el-Gharb, but the brick walls themselves are thinner.

From the north wall project the remains of a tower, in the direction of which the road of approach leads. There seems to be no doubt that the doorway was on the east face of this tower, but the north and west walls have been broken through in such a way that the openings on the three sides now resemble one another closely.

On the south side of the fortress projects a brick wall no less than 28 metres long resting on a masonry basement; this wall completely covers a projecting spur of the rock. Two similar brick walls covering spurs of rock may have projected from the east wall; but of these the indications are not clear.

On the west side, near the north-west angle, is a well-preserved staircase of steep steps descending to the water between two thick walls; the whole is of dry-laid masonry.

The bricks used in the walls of this fortress are of clean alluvium very free from stones or broken potsherds. In some places the brickwork rests directly upon the rock, but elsewhere it stands on the stone platform above described. As at Semna el-Gharb the bricks are laid in horizontal beds. Above every fourth course is a mortar

joint thicker than elsewhere, and in these thicker horizontal joints or beds mats of vegetable fibre—dry *halfa*-grass—are seen. In many cases these mats are laid double, i.e. one layer with the leaves lengthways along the wall and a second with the leaves laid crossways above it. The thin leaves and stems of the grass are fastened together by cords formed out of the long leaves and woven in and out of the stems. The bricks, which are not very exactly made, measure $0{\cdot}32 \times 0{\cdot}15 \times 0{\cdot}08$ or $0{\cdot}09$ m.

Timber bonding is dotted about with a liberal hand in the substance of the walls, both transversely and longitudinally; no system can be observed in the arrangement. The pieces of wood are neither long nor straight.

Within the enclosure of the fortress is a small temple, fairly well preserved but much entangled with the houses of sundry natives who live in and around the ancient building, finding its venerable brick walls—these still stand to a good height—a welcome protection against the keen winds and against marauding beasts. Plans of the temple may be seen in LEPSIUS, *Denkmäler*, Part I, Pl. 113 and also in BUDGE, *op. cit.*, Vol. I, p. 588.

Although the main road, judging by the position of Bûhen, Matûka, and some remains of forts even further south than Semna, was on the west side of the river, as it still is, yet there are a considerable number of *graffiti* on the rocks leading to Semna el-Sharq from the north. There are doubtless some, too, on the west side, but I did not observe any.

## IV. NOTES ON THE POSITION OF THE INSCRIPTIONS AT SEMNA RELATING TO THE LEVELS OF HIGH NILES.

These inscriptions were first observed by LEPSIUS in 1844, and have on various occasions been studied by Egyptologists, though but few have found occasion themselves to penetrate the barren recesses of the Baṭn el-Ḥagar. I shall on no account venture to submit any opinions on the value or true readings of the inscriptions, but shall merely offer a few notes on the positions occupied by them. I have seen no such notes published, and yet I believe the question of their position to be one of great importance[1].

Some students believe that, in the years specified in the inscriptions, the water rose to the actual positions where the records stand. According to others, however, these were placed at a definite fixed height above the actual levels of high Nile, which, it is assumed, were much the same as at the present time; but what the exact interval is, on this view, supposed to be, I cannot say.

The greater number of the inscriptions are at the east side of the cataract, some being cut upon the rock and some upon the substructure of masonry that supports the fortress of Semna el-Sharq. It will be recalled that the brick walls of this fortress rest for the most part upon a basement of dry-laid masonry. The stone-work of this basement has in it a few blocks of some size, but the majority of the pieces are not very

[1] Mr SOMERS CLARKE has evidently not seen the final volume of the text to LEPSIUS' great work, which appeared only in 1913. In this volume (*Textband* V, pp. 220—225) LEPSIUS carefully notes the heights of the more important records of the Nile-levels, giving a valuable diagram, and does not appear to doubt that the high Niles actually reached the points where the inscriptions occur. Whatever the truth of the matter may be, Mr SOMERS CLARKE's remarks and objections will retain their interest and importance.—ED.

large, and owe their rectangular shape either to the natural cleavage of the material or to very primitive instruments, probably stone hammers. This being so, the resultant masonry is not at all well calculated to bear the strain of a great and roaring mass of water[1]. To give an idea of the force of the water that rushes over the cataract at high Nile it may be mentioned that when, during the Wolseley expedition, it was decided to pass up this place some stern-wheel steamers, it required a thousand men at the ropes at the highest steam-power available to move each boat against the current.

The inscription of which the position is marked on my plan (Pl. XXXII) as 1 stands at the highest level. It is not cut on the rock but on a long thin stone of the basement, not more than a metre below its top level, in other words not more than a metre from the lowest courses of the brickwork.

Inscription 2 is carved in the natural rock lower down than no. 1. This inscription and another beside it are on the rock that bears the flight of steps leading down to the water.

Inscription 3 is close to the preceding, facing south and on the same shoulder of rock.

Inscription 4 is on a block of stone forming part of the south wall of the spur containing the staircase. It is as much as seven metres beneath the top of the artificial basement on which the brickwork stands.

Inscription 5 is not more than one metre below the top of the basement, and is cut on the rock. There are sundry other inscriptions.

We must first consider the probable result should the water have risen as high as is indicated by Inscriptions 1 and 5. No. 1 is on an artificial construction well enough suited to bear the pressure of a heavy brick wall, but not to withstand the rush of a volume of water. In addition, no building material is more susceptible to damp than sun-dried brick. It can hardly be doubted that the damp would have worked its way up through the short interval of a metre, and we should have witnessed the result of this either in extensive dilapidations or in considerable patchings. This, however, is not the case. The lowest courses of brick, resting on the masonry, are perfectly well-preserved and sound.

Inscription 4, as before stated, stands not on the rock but on a piece of stone forming part of the south wall of the staircase. At the time I visited Semna el-Sharq, in December 1898, the water was rushing by with tremendous velocity at a considerable distance below the inscription, and I should doubt whether it is at present reached by the high Nile. The masonry here does not consist of large and heavy stones; on the contrary, the outward skin is but one stone in thickness, the stones being of fair size but not bonded into the backing, which is of smaller loosely placed stones forming a mere filling. There is nothing here that would enable the stone to resist the violent rush of the waters almost at right angles to the surface. With the water at the level of Inscription 1 nearly every part of the masonry enclosing the steps would be immersed and, in all probability, carried away.

[1] It should not be overlooked that within the faces made of the blocks comparatively small stones and even chips were also used. This method of building sufficed to sustain the weight imposed upon it, but was quite unsuited to withstand a rush of water.

It has been stated that Inscriptions 1 and 5 are but a metre below the top of the stone basement, which is on the same level as the platform forming the floor of the fortress. If the waters rose to the level of these inscriptions, the fortress would have been inaccessible except by boat; for not only would the northern and southern faces have been isolated, but also the neck which separates the castle rock from the main ridge would have been submerged, and that not in standing water but in a swiftly moving stream of some volume.

Is it probable that those who laid out, with so much skill, the plans and general arrangements of the two fortresses can have overlooked the facts above named? No traces of a causeway can be seen. Perhaps, for the time, the water was considered as a ditch.

The steep face of rock at Semna el-Sharq is well adapted for use as a Nilometer of a rather primitive description. Near the western fortress there is no similar face of rock.

Thus I venture to believe that if the waters at Semna el-Sharq actually rose to the highest levels indicated, and did so a considerable number of times, that fortress and much of its masonry substructure would inevitably have been ruined. Also I would suggest that the position of the inscriptions, whether on the masonry or on the rock, indicate that the substructures we now see, the great ditches, glacis, etc. all belong to the original buildings of the XIIth Dynasty. Most probably the greater part of the brickwork is also of that period. The Egyptian kings were past-masters in the art of blowing their own trumpets. Whatever Thothmes III may have done he would be sure to have made the most of. The inspection of the walls which I was able to make during my stay at Semna, and which was not assisted by careful excavation, did not induce me to think that any very great repairs had been executed by Thothmes. The knowledge, resourcefulness, and ingenuity that are displayed, belong, as I believe, altogether to the XIIth Dynasty, or are due to experience gained still earlier.

## V. Building in Brick.

In the above description of the fortresses all references to the methods used in the building of their brickwork have been reserved until the last, in order to avoid useless repetition.

The bricks themselves are in every case made of Nile alluvium dried in the sun, and are always large. Whereas for private works bricks of a handy size, similar to those made at the present day, were used, all public works were constructed of the large bricks. These are, as a rule, far more carefully formed than the others, and are considerably harder. The hardness of bricks depends not a little on the length of time during which they are exposed to the sun before use. In order to harden the clay further, chaff (*tibn*) broken up rather small was often employed, as it is to this day; this is mixed closely with the mud, after the latter has been rendered very plastic; the compound is then left to stand a few days, and then made up into bricks.

In dealing with the dimensions of sun-dried bricks it must always be borne in mind that the rather primitive methods of manufacture and the number of the wooden moulds employed—these would wear out quickly—together with the variation in the

nature of the clay, would naturally lead to considerable differences in the sizes of the finished bricks.

Dimensions of the bricks:

| | |
|---|---|
| Semna el-Sharq | 0·32 × 0·08 × 0·15 m. |
| Semna el-Gharb | 0·32 × 0·08 × 0·14 m. |
| Matûka | 0·31 × 0·07 × 0·16 m. |
| Dorgaynarti | 0·32 × 0·08 × 0·10 m.<br>0·35 × 0·35 × 0·10 m. |

I have not anywhere else, except on the island of Mayanarti, met with bricks of so great a size, or of such a form, as the last-named, which may belong to a later period.

The largest of the bricks named in my list is but a very small thing as compared with the mass of a wall 7 to 8 metres in thickness.

In such a mass, when composed of small parts, there is a tendency to separate in the middle longitudinally, this tendency being due to the unequal strains that may fall upon it owing to weakness either in the foundations or in the subsoil. It cannot be denied that the Egyptians were often very careless about foundations, and that they often found themselves in difficulties on account of a subsoil composed of alluvium and subject to saturation at high Nile, a subsoil that would be solid and resistant at one time, and soft and yielding at another.

Another very serious trouble also presented itself. A brick made of unburnt clay, however well it may have been dried in the sun, is not very resistant. A mass of these bricks behaves just as a mass of lead might do, resembling a slowly moving fluid when subjected to strain. Further, it must be remembered that the mortar used was nothing but a preparation of wet Nile mud. The difficulty which presented itself to the builders was to find a means of keeping the brickwork from spreading or splitting longitudinally whilst the mud mortar was drying; the latter kind of movement was particularly hard to prevent. In the mortar joints at Matûka a large quantity of granite broken into small pieces is seen. Since in all other cases river mud is used both for the bricks themselves and for the mortar, it seems likely that some special purpose was served by the granite gravel. Is it not possible that it was meant to assist in keeping the courses of brick from slipping?

In Upper Egypt, where the summer temperature often considerably exceeds 100° Fahrenheit, and for weeks together seldom is below that mark, it nevertheless takes a crude brick wall of 0·75 m. thickness quite a year to get thoroughly dry and firm in its interior. This I assert from personal experience, and not merely from hearsay. How many years, then, must it not have taken for the inside of a wall of 7 or 8 m. in thickness to become dry and hard? Certain of the great brick walls measure as much as 12 m. in thickness, and at Matûka we even find one 16 m. thick.

Examining the fortress walls at Matûka, Semna el-Sharq, Semna el-Gharb, etc. from a little distance away, we can observe series of clearly defined horizontal lines due to the thickening of the mortar joints at definite intervals one above the other. We can also observe irregular rows of dark spots, which are formed by the shadows cast in holes in the brickwork. These latter M. Choisy interprets as the places where "putlogs" were inserted to carry the scaffoldings made by the workmen[1]. Upon these

[1] A. Choisy, *L'art de bâtir chez les Égyptiens*, Paris, 1914, p. 31.

"putlogs," he tells us, boards were placed for the workmen to stand on. One of the neatly-drawn diagrams for which M. CHOISY is famous explains his fancy in this matter. In the description of the fort at Ikkur before quoted[1] the writer falls into the same error in consequence of not having duly examined the construction of the walls. Both authors thus credit the Egyptians with the methods of scaffolding they have seen utilized in Europe.

In criticizing their view, I must first return to the horizontal lines that have been described as appearing at intervals in the walls in the form of joints thicker than those above or below them. At Semna el-Sharq we find these joints above every fourth course of bricks, and at Semna el-Gharb above every fifth course. At Matûka these joints are not very conspicuous; where they do occur they are above every eighth course. In these courses we find the mats of *halfa*-grass already described[2]. It is obvious enough that the object of these mats was to check the tendency of the bricks to move or spread in the still soft mortar. In many cases the grass is found in each of the horizontal mortar joints. But there can be little doubt but that these thicker beds of mortar further indicate that the builders were instructed to lay four courses or more, as the case might be, and then to discontinue the work until an equal level was attained all round the building. By this means many chances of movement or of uneven settlement would be avoided.

It should be stated that in all the Nubian fortresses described in this paper the brickwork was laid in horizontal courses, and not in the undulating courses that are so often seen in Egypt.

In addition to the use of these mats of *halfa*-grass, immense quantities of timber bonds were laid both longitudinally and transversely in order to bind together the great semi-plastic masses of brickwork. This brings us to M. CHOISY's theory of the "putlog" holes. It is the decayed ends of the transverse timbers that he mistakes for marks of scaffoldings. M. CHOISY, in his three months' tour in Egypt, worked with amazing industry, but when he wrote his book he drew very largely on his imagination; nor is it very easy to ascertain from his expressions what he thinks the ancients may or might have done and what they actually did. The value of his book is sadly diminished in consequence of the very positive way in which his theories are stated, and the manner in which those theories are mixed up with observed facts. The point here under consideration is a typical example of such misstatement, supported by a pretty little diagram or two.

The Egyptian methods of building with sun-dried bricks, as everyone may see for himself who has lived in the country, studied its monuments, and had brick buildings erected there under his own eye, are much the same now as they were centuries ago. The builders do not make use of scaffoldings but stand on the wall; as it rises so do they. Their bare feet moving about on the top of the layer of bricks already laid actually help to press the bricks into position and to solidify the work.

M. CHOISY even finds that the "putlog" holes are placed vertically apart at a distance of six feet, just as we place them now. The ties of timber bonding, which were no "putlog" holes, are in reality much nearer together than that; at Ikkur they are 90 cm. apart in the vertical direction.

[1] *Archaeological Survey of Nubia: Report for* 1908–9, Cairo, 1912, Vol. I, p. 24. [2] Above, p. 174.

At Matûka they are used but sparingly. In the inner western wall they are laid where the wide mortar joints occur, i.e. on the top of each twelfth course of bricks and about one metre apart vertically. The bond is used for the most part transversely through the thickness of the wall.

At Semna el-Sharq bond timber is employed in large quantities and without much systematic arrangement; some pieces are longitudinal, some transverse.

At Semna el-Gharb the walls are riddled with timber ties, mostly of the transverse kind.

Thus in none of the fortresses studied in this paper does it appear that the timber bonds have been placed at a vertical distance of six feet apart; nor am I aware that such is the case with any of the great bricks walls in Egypt. I venture to assert that no evidence exists for the employment of timber scaffolding, in our sense of the word, in connection with any ancient Egyptian building.

In conclusion, I must express my hearty acknowledgements to Mr R. DOUGLAS WELLS, who not only assisted me in collecting the materials for this paper and taking the requisite measurements, but has also been good enough to prepare many of the plates for the printer.