

# Medum.

BY

W. M. FLINDERS PETRIE.

WITH CHAPTERS BY

F. LL. GRIFFITH, DR. A. WIEDEMANN, DR. W. J. RUSSELL, F.R.S.,  
AND W. E. CRUM.

**Cornell University Library**

THE EISENLOHR COLLECTION IN  
EGYPTOLOGY AND ASSYRIOLOGY

PRESENTED TO CORNELL UNIVERSITY BY

**A. Abraham**

**1902**

*A. 164478*

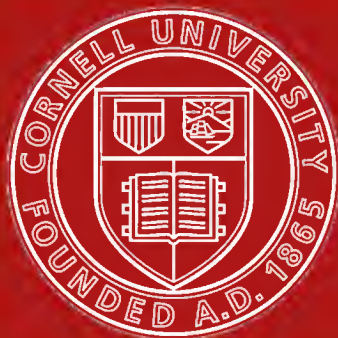
*4/8/1902*

Cornell University Library  
DT 73.M4P49

Medum /



3 1924 028 670 465 oia,ove2



Cornell University  
Library

The original of this book is in  
the Cornell University Library.

There are no known copyright restrictions in  
the United States on the use of the text.

<http://www.archive.org/details/cu31924028670465>





1



2



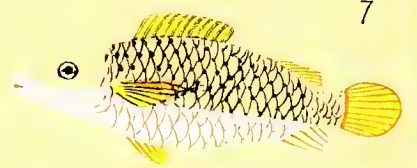
3



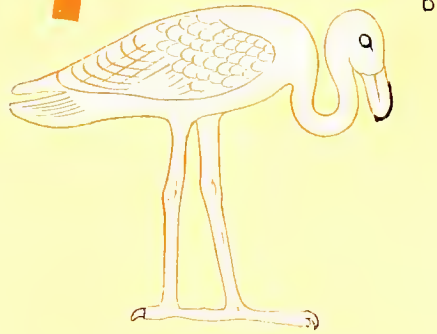
4



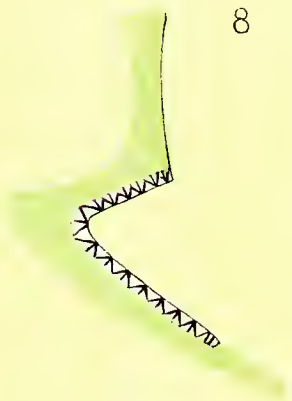
5



7



6



8



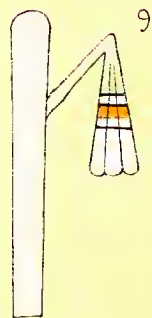
10



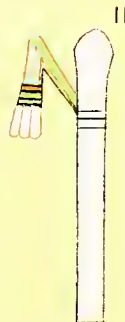
12



13



9



11



14



15



16



17

# M E D U M .

BY

W: M.<sup>atv.</sup> FLINDERS PETRIE.

WITH CHAPTERS BY

F. LL. GRIFFITH, DR. A. WIEDEMANN, DR. W. J. RUSSELL, F.R.S.,  
AND W. E. CRUM.

LONDON:

DAVID NUTT, 270, 271, STRAND.

1892.

II

A.164478

LONDON:

PRINTED BY WILLIAM CLOWES AND SONS, LIMITED,  
STAMFORD STREET AND CHARING CROSS.



# CONTENTS.

SECT.	PAGE	SECT.	PAGE	SECT.	PAGE
<b>INTRODUCTION.</b>					
1. Settling to work . . . . .	1	30. Mastabas with open chamber . . . . .	19	54. Plate XXXI . . . . .	35
2. Copying the sculptures . . . . .	2	31. Mastabas with sloping passage . . . . .	19	55. Analyses by Dr. Gladstone, F.R.S. . . . .	36
3. Opening the tombs . . . . .	2	32. Lesser tombs . . . . .	20	<b>CHAPTER VI.</b>	
4. Finding the temple . . . . .	3	33. Contracted burials . . . . .	21	(Plates XXXII-XXXVI.)	
5. Clearing the temple . . . . .	4	34. Mutilations of bodies . . . . .	21	<b>THE INSCRIPTIONS.</b>	
6. Other excavations . . . . .	4	<b>CHAPTER III.</b>			
7. Personal . . . . .	4	(Plates IX-XXVIII.)			
<b>CHAPTER I.</b>					
(Plates I-IV.)					
<b>THE PYRAMID AND TEMPLE.</b>					
8. Construction of the pyramid . . . . .	5	<b>THE SCULPTURED CHAMBERS.</b>			
9. Survey . . . . .	5	35. Scale and accuracy of plates . . . . .	22	56. Architect's note . . . . .	37
10. Form of the pyramid . . . . .	6	36. Method of copying . . . . .	23	57. Mastaba inscriptions . . . . .	37
11. Inner coats of pyramid . . . . .	6	37. Plates IX-XII; Rahotep . . . . .	23	58. Statuette and ostracon . . . . .	40
12. Peribolus . . . . .	7	38. Plates XIII, XIV; Rahotep . . . . .	24	59. Graffiti of temple . . . . .	40
13. Temple . . . . .	8	39. Plate XV; Nefert . . . . .	24	<b>CHAPTER VII.</b>	
14. Courtyard . . . . .	8	40. Inlaying by Nefermat's method . . . . .	24	VARIETIES OF ANCIENT KOHL.	
15. Causeway . . . . .	9	41. Plates XVI-XXI; Nefermat . . . . .	25	By Dr. A. Wiedemann.	
16. Contents of temple . . . . .	9	42. Plates XXII-XXVII; Atet . . . . .	26	60. Names of eye paints . . . . .	41
17. Southern building . . . . .	10	43. Plate XXVIII; Frescoes . . . . .	27	61. Account of samples . . . . .	42
18. Grooves on pyramid . . . . .	10	44. Colouring of Rahotep . . . . .	28	62. Galena powders . . . . .	42
19. Entrance passage . . . . .	10	45. Colouring of Nefermat . . . . .	29	63. Antimony and other powders . . . . .	43
20. Lower passages and chambers . . . . .	11	<b>CHAPTER VIII.</b>			
<b>CHAPTER II.</b>					
(Plates V-VII.)					
<b>THE MASTABAS AND BURIALS.</b>					
21. Mastaba No. 17. . . . .	11	<b>CHAPTER IV.</b>			
22. Builders' construction lines . . . . .	12	EARLY HIEROGLYPHS.			
23. Cubits and dimensions . . . . .	13	46. Importance of epigraphy . . . . .	29	65. Red and yellow of Kahun and Gurob . . . . .	44
24. Interior . . . . .	13	47. Natural signs . . . . .	29	66. Blue and green frits . . . . .	45
25. Mastaba 16, Nefermat . . . . .	14	48. Architectural signs . . . . .	30	67. Greco-Roman colours . . . . .	47
26. " 6, Rahotep . . . . .	15	49. Weapons and tools . . . . .	31	<b>CHAPTER IX.</b>	
27. " 6, Annex . . . . .	17	50. Sceptres, ornaments, &c. . . . .	32	THE COPTIC PAPYRI.	
28. " 9, Ranefer . . . . .	17	51. Rope numerals, &c. . . . .	33	By W. E. Crum.	
29. " 8 . . . . .	18	<b>CHAPTER V.</b>			
<b>THE SMALL ANTIQUITIES.</b>					
52. Plate XXIX . . . . .	34	68. Manuscripts of Fayum . . . . .	48	69. Theological texts . . . . .	48
53. Plate XXX . . . . .	35	70. Letters . . . . .	49	71. Accounts and lists . . . . .	49



---

---

## INTRODUCTION.

1. After having explored and described the towns and products of the XVIIIth dynasty at Gurob, and the XIIth dynasty at Kahun, I naturally turned my eyes to what seemed with reason to be the oldest dated site in Egypt, the cemetery of Medum, which was not far distant. Some time was lost before I could begin work, by the attempted imposition of new and onerous conditions ; but after a good deal of trouble and discussion I had the satisfaction, thanks to Sir Evelyn Baring, of seeing reasonable terms established for scientific work in Egypt, distinct from the conditions for plundering merely for purposes of profit, which should indeed be wholly prevented. So vast an amount has been altogether lost, that the remainder should be rigidly guarded and reserved for scientific examination, from an archæological and ethnologic point of view, rather than merely for finding inscriptions and bronzes. The present system of allowing native overseers and others to plunder tombs for their private benefit, without the publication of any results, is most deplorable ; and it has cost us the loss of all the information that might have been recorded from the cemeteries of Ekhnim, Siut, Mea, and innumerable other sites. Destruction is not the less to be deplored because it is done by legalised agents. Very few Europeans in Egypt, and still fewer natives, would think of spending the needful time to secure details before they are lost in working. To spend one to two hours cramped in a small hole, picking out the tiniest bones of a skeleton from a tomb, and noting its position and any peculiarities, is absolutely needful if we are to understand the details of the race whose works we are studying ; and such care has seldom, if ever, been given by excavators.

I began by going over to my old quarters at Illahun to fetch my baggage, and engaged two or three dozen of my old workmen, who were all willing

to go with me. They, and others of my older hands from near Medinet, used to walk over sixteen or eighteen miles with a sack of dried bread, work for ten or eleven days, and then walk back for fresh supplies, thus returning every fortnight. These men and boys were as honest and pleasant fellows as I wish to see ; they camped in rough huts by my tent, and served as guards by night and workmen by day. I shall not forget the strange astonishment that it was to me when a visitor asked Who protected my things? and If I could trust my people? I never missed any property while I was there ; and even if treasures, such as a pocket knife, happened to be left outside derelict, no one disturbed them. The thorough kindly simplicity and good feeling of all the party made it a pleasure to be with them. Where the Egyptian is constantly misunderstood is by applying English standards to him. He has many points in which he is better and pleasanter than an English workman ; but he cannot stand long-continued temptation of any sort, nor being "given his head" in any way. He needs "bossing," and he feels the want of a "boss." When I was called away to Cairo, and left my men for a few days, with an ample supply of piece-work to go on with, I found that they had not the heart to do it when not looked after, although the loss was theirs. If constantly encouraged they will earn surprising amounts, by work so hard that any person would cry shame if they were forced to do it. To tempt such people by constantly giving them opportunities of stealing or cheating is extremely wrong ; but by guarding against this, and letting them feel that they are always kept in hand and noticed, they prove admirable and industrious workers. Of course so far as possible all my work was piece-work ; and though the rate was only from  $\frac{1}{2}$  to 1 piastre the cubic metre, or 1*l.* to 1 $\frac{3}{4}$ *l.* the cubic yard, according to the hardness of the ground, yet they usually earned 18*l.* to 2*s.* a day for a man and boy, double the best native wages ; 15 to 20 cubic yards

## INTRODUCTION.

was a common discharge for a couple. I also employed many men from Medum and the villages near; and some of them were splendid workers. One couple were nicknamed "The Fiends"; Handawi, the man, was always rampant for fresh ground, and slaved without intermission, and his lad ran to and fro the whole day, carrying baskets of stuff and stones piled on the top, on his back. Where the stuff required to be moved to a distance I used to keep the same rate for the metre, but allow the couple to bring a boy to help them, to whom I paid day wages in addition. These boys then were kept going by their patrons, and gave me no extra trouble; two additional day boys were sometimes given to each couple of metre workers, where the stuff had to be carried perhaps 100 feet distant and 20 feet up. Such a system works very easily, is little trouble, and costs less than any other.

I left Illahun with a couple of camels and a gang of men and boys, and skirting the desert we walked eighteen miles down to Medum, which is about forty miles south of Cairo; there I looked round for a camping-place, where I could be quiet, and not hear the men talking at night. For this end I settled into Nefermat's sculptured chamber for my bedroom, and pitched a tent in the front of it for stores and cooking. Another tent served for a few of the men, and the rest made huts of the bricks of Nefermat, which had been thrown out by the hundred in past excavations there; these, roofed with durra straw, served them for dwellings all the winter, although they found it a cold harbour without any doors, in frosty nights. I had not long been there when I had the pleasure of Mr. F. Bliss coming to join me for three or four weeks, to examine all the details of excavations, before he took up the continuation of my work at Lachish for the Palestine Exploration Fund. I had also several visitors, as Medum was within the range of the private tourist. Since it was needful to close all the tombs the visitors will find less to look at, and probably drop it out of their programmes.

2. After clearing the known tombs, there was a lengthy business in copying them. This could not in most parts be done by wet squeezes, as there was colour on some of the stone, still left after the wet squeezes which had been most shamelessly taken before. I therefore took dry squeezes: holding up a strip of paper, three feet long and one foot wide, against the stone with the left hand, I outlined all the sculpture with my fingers, creasing the paper over the edge if it was incised, or scoring the outline with

my nail if it was in relief. To do this accurately needs care; as, if the paper is marked to the outline of the carving the figure will be too wide by the amount of curvature. The mark must be made therefore on the rounding of the edge, guiding the nail by holding thumb and finger together. Having obtained a creased outline the sheet was laid on a board and drawn over by freehand, following the marks and interpreting them by looking at the sculpture. In this way, during six or seven weeks, about 1200 square feet of sculpture was copied in full-size drawing, and notes of the colours marked. After returning to England these slips were matched together, marked, turned over and joined by strips of adhesive, so as to form large rolls, equal to the height of the chambers, 10½ feet, and about 3 to 5 feet wide. The outlines were then all inked in, and the sheets were ready to be photo-lithographed. The joining took over a week, and the inking took a month, beside some kindly done by Mr. Spurrell.

3. After the drawing I worked at most of the mastabas and the tomb pits that I could find. But I found that the old people had had their pickings first, and had plundered every tomb that was worth clearing. The full knowledge of the arrangements that was shewn by the spoilers, is evidence that the attacks were made soon after the closing of the tombs, and while the secrets of their plans were still known. Very possibly some boy employed in the building went there fifty years later, when the place was left deserted, and made use of his memory. In one mastaba were three pits. I first found the central one; it contained absolutely nothing but clean rock chips in the pit and chamber. The next we found contained only some bowls and flints in the bottom of the pit. Both of these were left untouched till I went there; but the third pit, with masonry below it, had been all plundered and wrecked, so that we could not clear it in safety; this doubtless was the sepulchre. In the next mastaba I cleared a large pit, which was untouched; with great excitement we found the stone trap-door; Mr. Fraser, who was there at the time, helped me to shift it out with crowbars, and cut out the stone filling of the passage, only to find that a tunnel had been made from the outside straight to the chamber, which was entered by breaking a hole in the floor. Two mastabas, however, I did not succeed in entering; and it was evident, by the various forced tunnels, that other people had been equally unsuccessful. Possibly no one has yet found those chambers. The common tombs repaid our

labour best, not from objects of workmanship, but from the many complete skeletons of that remote age which I was able thus to collect.

4. The main piece of work was on the pyramid. I went there with the idea of finding, if possible, the temple, as I had found the temple of Illahun. It was soon clear that there was no temple on the desert edge, distant from the pyramid; and I tried pits in the concreted rubbish within the peribolus on the east side, but reached nothing but rock, although I afterwards found that I was within a few feet of the temple door. I hesitated at attacking the great mass of rubbish piled up against the east face of the pyramid. I walked about it, and speculated on it for several days, while we were clearing the corners for my survey. At last I determined to broach it; but it was needful to begin on a large scale, as I knew that I had to descend through over forty feet of more or less loose stuff; and a wide hole was needed at the bottom, to search for the temple. So I marked out a space 70 feet long and 40 feet wide up the slope of rubbish; and, dividing that into strips or stages, I allotted a stage 7 feet wide and 35 feet long to each man and boy. Thus each party delivered the stuff out at the ends of my great hole, the six north stages delivering at the north end, and the south stages at the other. So far we started fairly, and the measuring of the work was simple. But soon we found large blocks of casing and other stones from the pyramid, all lying at the angle of rest in the sloping strata of rubbish; and as we descended these had to be taken out of the way. Then, almost without being able to help it, one big block and then another (which the men detested as hindering their piece-work) slipped off the stage and went bowling down all the other stages, breaking up their regularity. Then the trouble came, whose block was whose? Of course I gave some extra pay for moving out big blocks, but they were a terrible nuisance, and dangerous as well. Two or three times I had to break off all piece-work, and set the whole gang of twenty-four or more to work together at clearing out blocks, arranging all the shifting myself. Though we had dozens of stones so heavy that they needed every man we could get around them to stir them, and tedious crowbar work, yet we happily escaped any accidents beyond scrapes, and a few trapped fingers and toes. As we descended a fresh trouble arose; for the rubbish was much weaker in some parts and could hardly sustain the large blocks left in the steep side of the hole. There were some great

pieces which I expected to see drop any hour, but which yet held up to the last.

Of course in cutting a deep hole in a slope the stuff soon has to be lifted out, and so before long it was impracticable to shoot it at the end of the excavation. Then I opened two trenches, leading east from the two sides of the work, which carried off the stuff till we were low down; and finally one deep cut in the middle took out the bottom stuff and left the hole of a T form. Thus by distributing the stuff from different periods of the work at different parts, I avoided raising it up a mountain of rubbish at the last, and left the 6000 cubic yards so spread as to be the least inconvenience. Whenever a large hole is made one of the least obvious—but most necessary—points to consider is, where the stuff shall go; it cannot be annihilated, and before beginning work it is well to fully imagine as one looks at the ground what the hole will be like, and how that amount of stuff had better be placed.

At last we reached the bottom, and there found the sloping casing of the pyramid, and a wall at right angles to it, and the side of a great stele; our hole was a success, but it only shewed where a building existed by revealing one corner of it. We then had to enlarge the pit at the north end, and before we had gone far with that a fresh trouble arose. We had on each side an imminent wall of loose rubbish; on the west it was as high as a London house—sand and chips and big blocks—all sloping in stratification so as to slide off into our hole, from a height of forty or fifty feet. I gave a moderate slope to this face, about 1 in 4, which sufficed to hold it up so long as the weather was tranquil. But soon a raging gale arose; I was in the pit some time that day, and shall never forget the horrid confusion. The air was so full of whirling sand that one's eyes had to be kept longer shut than open; whenever the battering of sand on one's face ceased for a moment, and it was possible to look about, the clouds of dust almost hid the sides of the cutting. And as the sand was blown out from the face of the work, the stones came rattling down in avalanches. The width of the place was enough to enable the men to stand in safety on one side when a rush came, but constant attention was needful. At last, in the midst of a grand howl of the gale, we instinctively looked up through the murky brown cloud in which we stood, and saw nearly all the higher side of our pit coming over in a block; one man only was in front of me; I saw him dash back past me just in time, and knew that they were all

safe behind me, when smash came five feet thickness of stones and sand over the greater part of our work. So completely did this disorganise affairs, that it took us a week to get it cleared out, interrupted by continual lesser falls. The scour of the wind constantly undermined the face, and burrowed deeper and deeper into the slightest hollows, until the top overhung, and the face was grooved out, leaving tall slender pillars of loose stuff.

5. After some three weeks of work, from having first seen the building, we again reached bottom, and cleared out the whole of the courtyard. To my surprise there seemed to be no entrance to it, but a continuous wall around it. But as we cleared down we soon found a doorway, and I crawled into the perfect chambers, which had not been touched since the XVIIIth dynasty. To find under all that depth of ruin such a complete building was an entire surprise; all I had looked or hoped for was to trace some foundations, and find some fragments; but here nothing seemed to have been disturbed or injured throughout the whole length of recorded history. Here stands the oldest known building in the world as perfect, except for slight weathering, as it was when even Egypt was bare of monuments. I eagerly looked over the inscriptions on the walls, which I saw were of Tahutmes III. and Amenhotep III.; but my satisfaction was complete when I caught sight of Seneferu's name, and knew that at last there was monumental evidence for an attribution, which had always seemed very probable, but which had been as yet without proof.

The next work was to cut another pit to reach the outer door of the temple; and very glad I was that I had not put all the stuff in front of my great pit, but had so widely spread it; for thus there was not much to move a second time to reach the temple front. I measured it all completely, photographed it, drew it, copied all the inscriptions, and then reburied it as thoroughly as could be desired. To have left it open would have been to ensure its destruction in six months. The pyramid of Medum is the quarry of all the neighbourhood. Large piles of stone are to be seen in the villages, all taken from there. The desert is furrowed with cart tracks in all directions from the pyramid. Every decent Medumi that dies has a stone tomb built of pyramid casing. Expert stone-splitters live there, who know how—with only a hammer—to split up a 6-ton casing block into long bars of stone, as I have seen them do in a quarter of an hour. The

great open quarries on the pyramid side are the sign and the scandal of the present order of things. It is only the vast mass of the pyramid that has saved the tombs of Medum from utter ruin, and already one block of the sculptured lintel of Rahotep's tomb is gone. What wonder when no official ever goes to the place to inspect? and even if a native guard was there he would be as capable of selling the stone as of selling the antiquities in his charge. The very tombs of Gizeh are sold for stone to the villagers by the overseer there.

6. Besides clearing the temple I opened up each corner of the pyramid, and found the original casing remaining, even the actual corner casing-stone in one place. This gave the material for an accurate survey of it. I also traced out the peribolus wall all around it, and the causeway which led up to it from the plain, and now runs down under water-level. I also exhaustively cleared the inside of the pyramid to see if there were any other chambers or passages. For though it was opened nine years ago by Professor Maspero, the accumulation of stone and rubbish in it had never been turned over. Every part of the rock, or the flooring, of all the chambers and horizontal passages has now been examined. It is most curious to see the original great logs of wood wedged in at the sides of the shaft in the pyramid; still sound and firm, although saturated with salt. Four months' work at Medum has cleared up most of the questions about it, and recorded its sculptures beyond reach of future loss; though there are still some interesting matters awaiting a future explorer in that place.

7. The same friends as before have continued to help forward this work in various ways. The costs of labour and transport have again been defrayed by Mr. Jesse Haworth and Mr. Martyn Kennard. Mr. Spurrell, I have to thank for continual help with head and hands in the details of the collections, and in special researches of his own. Mr. Griffith has now, as always, rendered every assistance in respect to the inscriptions. And I am indebted to Brugsch Pasha for favouring me with a first and hurried translation of the graffiti, when I had the copies in Cairo. Two chapters here are products of my previous work; the examination of the specimens of Kohl, for the account of which I am obliged to Prof. Wiedemann; and the description of the Coptic papyri, which Mr. Crum has taken in hand. I only now hope that my coming season in Egypt may be as productive of historic results as those which have gone before.

## CHAPTER I.

## THE PYRAMID AND TEMPLE.

8. The pyramid of Medum is peculiar in construction, and unlike all others, excepting the small pyramid of Rikkeh, and the oblong step-pyramid of Sakkara. These three pyramids have been built cumulatively, that is to say in successive coats each of which bore a finished dressed face; and furthermore two of these pyramids, Medum and Rikkeh, have outer casings in one slope from top to base, like the pyramids of the usual type. The system by which the construction was carried on bears an evident analogy to the building of the great mastaba tombs in the cemetery of Medum. These tombs were rectangular masses of brickwork, or of earth coated with brick, with faces sloping at about  $75^\circ$ , the mastaba angle differing from the usual pyramid angle of  $51^\circ$ . These wide, flat "mastabas," or "benches," were added to during the owner's life by coating them with one or two thick masses of brickwork all around, thereby hiding the sculptured chamber of offerings which contained the statue. And outside of these coats a courtyard was built opposite the chamber of offerings, where the worship of the deceased person took place.

Such a system exactly agrees with what we see in the pyramid of Medum (see PL. II), only it was more fully carried out; the coatings were seven in number, the original mass was carried upward and heightened as the circuit was increased, and lastly a general coat covered over all the steps which had resulted during the construction. The primal mastaba appears to have been 100 cubits square and 25 or 30 cubits high: covering over the sepulchral chamber, which was reached by a passage just above the ground level, on the north face of the mastaba.

The outer casing was largely removed at an early date, probably by Ramessu II; in the middle ages it is described as having five steps, of which the two lower have been removed in modern times; thus leaving the high towering mass isolated in the manner which is familiar to all Nile travellers. Various misconceptions have been written about it by passing visitors, who supposed it to be a tower, and to have had decorations at the places where the steps formerly joined it; but such remarks need not detain us. The needful point to observe is that though this pyramid was built cumulatively, it is no warrant for assuming, as Lepsius did, that all other pyramids were

constructed similarly; on the contrary no evidence of such cumulative building occurs except in the three pyramids which I have named, and there is positive evidence that this was not the method followed in the later cases. In short it was a transitional form, when the mastaba had been greatly enlarged, and first began to be smoothed over into a pyramidal outline: that type once arrived at, there was no need for subsequent kings to retain the mastaba form internally, and Khufu and his successors laid out their pyramids of full size at first, and built them up at  $51^\circ$  and not at  $75^\circ$ .

9. The excavations that were needful for making a survey of the pyramid itself were not very large; but the discovery of the temple on the east side was a heavy undertaking. At each corner of the pyramid cuttings were made through 10 or 12 feet of rubbish, to reach the original pavement and casing stones. At the S.E. corner the lowest course of casing remains entire; at the other corners it has been partly removed, and is only found at 20 or 30 feet distant along the sides. Hence at these corners two separate points were determined in the survey, and the corner completed by calculation afterwards. The peribolus wall also required some excavation all along its course, to trace the remaining foundations; for the masonry wall itself only exists where its lowest course is left buried, in the deep mass of chips south of the pyramid. The temple excavations are described in other pages.

Having uncovered the ancient points of construction an accurate survey was needed. As I only had a 4-inch theodolite at the place, I relied more on lineal measure. Four stations were fixed at such a distance from each corner as to be visible one from the other; these were just outside the peribolus wall, except at the north-east, where the big mastaba No. 17 interferes with the flatness of the ground, and the station was nearer in. Then the distances of these stations were measured by a steel tape, suspended and strained by 10 lbs. tension. The points of support were nearly in a level line, and usually at about 30 feet apart; so the whole amount of corrections was in general only  $\frac{1}{8}$  inch for differences of level, and  $\frac{1}{30}$  inch for catenary curves, on a 100-foot length. Temperature was also noted. Probably the results are correct within '2 or '3 inch (=  $2^\circ$  or  $3^\circ$  cent.) on each base measured. The theodolite therefore (which was read to 10") was only trusted for the angles of the corners, for the short distances from the corners to the casing, and for the observations up to the upper steps. The casing points were observed on from a distance by

stretching a string across each excavation, and hanging a plumb-line down the hole to over the edge of the casing; the plumb-line was then observed from the survey corner, and from a station along one side of the measured lines. By measuring each angle, as well as each side, of the survey square, four independent checks were made; as, given four sides and one angle, the other three are mere results. In this way the values for the other three corners were calculated from each corner in succession, and the mean of the four values of the angle for each corner was adopted. The average error of the theodolite measurement was 24" on each corner, equivalent to about 1 inch on the length of the sides: hence the lineal measures are much the more accurate. The azimuth was determined by Polaris, with Canopus as a time star, taking three observations. Having stated the methods adopted, we will now describe the results. But as it is not likely that any one else will want to proceed on the lines of this survey, I shall omit here all reference to the purely trigonometrical stations, the nature of the station marks (which were only permanent, and buried, at the four corners of the survey) and the co-ordinates of the calculation of the results, which were entirely worked out on a rigorous basis.

10. The base of the pyramid is built on a pavement, which underlies the casing at every part examined, of both sides and corners. The pavement consists of three courses at the N.W., where the ground was rather low. These courses are not thick, being 17·6, 14, and 14 inches; and they project not far from the casing edge, being 22, 38, and 48 inches out, respectively. The base of the finished casing of the pyramid was on the

N. 5677·2, E. 5694·5, S. 5681·3, W. 5675·0  
and the azimuth of the sides was

N. 35' 25", E. 20' 35", S. 23' 36", W. 18' 3".

Hence the average length of the base is 5682·0 with an average variation of 6·2 inches: the average error of squareness at the corners is 10' 11": and its average azimuth is 24' 25" W. of N., or 359° 35' 35" in absolute azimuth.

The slope of the face cannot be well measured, as it is only seen for a few courses at the door, and over a very weathered surface discovered on excavating the temple. The latter was so far bad that I did not measure it. At the door the angle was taken as 52° 4', 51° 54', 51° 49', the first being worse than the other two: but on combining the triangulation of the door with that of the base the result would yield 51° 26'. As the latter is dependent on the straightness of the

N. base from corner to corner, which was not uncovered or seen, the directly measured angle is much better: I conclude therefore that it was within a few minutes of 51° 52'. Hence the height was 3,619 inches.

This angle, it will be seen, is just that of the Great Pyramid of Gizeh, which was built next after this pyramid. And we have therefore to consider if any of the theories concerning the size of that are elucidated by this. Now the most simple and promising theory is that the ratio of 7 : 44, for that of a radius to a circumference, is embodied by the Great Pyramid height being 7 × 40 cubits and its circuit 44 × 40 cubits; in short, that it was built 7 and 44 times a modulus of 40 cubits. The angle being the same here at Medum the ratio 7 : 44 will of course hold good; the question is if a simple modulus was used here also. The base being 5682·0 inches, it is 7 × 25 cubits in height, and 44 × 25 cubits in circuit; the cubit required being 20·66 ± 01 inches, or varying from 20·63 to 20·70 according to different sides, which is just the usual range of varieties of the Egyptian cubit. We see then that there is an exactly analogous theory for the dimensions of Medum to that for the Great Pyramid; in each the approximate ratio 7 : 44 is adopted, as referring to the radius and circle; in the earlier pyramid a modulus of 25 cubits is multiplied by these numbers to fix the dimensions; in the later pyramid a modulus of 40 cubits is used.

11. Turning next to the inner surfaces of masonry, of the successive coats of construction, seven such faces may be seen on the concentric masses (PL. II). We cannot at present see any surface within the topmost face visible, as the top of the pyramid is inaccessible: but there is some reason for supposing another surface to exist inside, as, granting that the step would be of the same width as that now existing at the top, the dimension of the central mass at the base, or the primitive mastaba, would be just 100 cubits either way. Such a face is therefore shewn in broken line on the section (PL. II), and is here included in brackets in the list of faces. The angles of the faces are variable; the upper part of the high face is at 73° 20', the lower part 73° 54'; and the faces now built over, from the outside through to the passage, are at 74° 40' and 75°. The tendency therefore seems to be for the lower and outer parts to be steeper than the higher. As an average I have used 73° 20' for reducing the sloping dimensions of the top steps; and 74° 21', or 100 on 28, for projecting the slopes down to the base. The steps at the top were



observed with the theodolite on the highest complete corners, and the number of courses broken at each corner was examined with a telescope, so as to make allowance for the lost parts. The heights of the courses were noted angularly by the theodolite. The outer coats were measured across where they are broken and accessible, at the top of the rubbish mounds. The results are that the mean sizes of the successive square coats at the pyramid base are as follow :

(2063), 2368, 2673, 3081, 3478, 3879, 4267, 4667 inches, but of course small differences may easily occur owing to the uncertainty of the angle at which these faces are built. The thickness horizontally of the coats which are implied above are, *in* ( $152\frac{1}{2}$ ),  $152\frac{1}{2}$ , 204,  $198\frac{1}{2}$ ,  $200\frac{1}{2}$ , 194, 200, inches, *out*. And the level of the finished steps above the base are :

*top* (?), broken, 2576, 2165, 1755, 1246?,  
978, 571 inches, *base*.

The steps vary somewhat on different sides. The top step varies from 2221 to 2236 horizontally from the outer base; the second step varies from 1890 to 1937. The lengths of the top edge of the top step vary 1212 to 1231, and azimuth from +8' to -34'; the second step is 1832 to 1905, at +42' to -70'. The thickness of the coats also varies, each ranging over 8 or 10 inches, in the parts where they can be directly measured. It is evident therefore that no great accuracy was aimed at in this internal construction, although it was finished off with finely-smoothed faces, well jointed, and of beautiful flatness.

The thickness of the courses varies, but is never very much. The average at the base, by the temple, is 16 inches; in the rough part above the rubbish 20·3; in different parts of the smooth faces 23·6 to 17·8; in the upper face 21 to 16; and in the top 19. The regular system of building was with alternate courses of headers and stretchers, the same as in the brickwork of the Medum mastabas. These blocks, where accessible, average 32 wide and 58 long. The inner masonry, within each of the finished faces is very rough; no attempt has been made to fit the blocks, except by selecting chance adjustments; the courses are approximately equal, but a coarse mortar is largely used to fill the hollows that are left. The stone also is very inferior, brittle, splitting, stained, and weathering badly; the outer faces, on the contrary, are of excellent stone, weathering to a rich brown, and seldom crumbling away, and the smoothness of the faces and of the jointing is very fine.

A line of levelling was carried all round the

pyramid, with a discrepancy of only  $\frac{1}{4}$  inch on the 2000 feet length, or 2". The resulting levels of the pavement surfaces at the corners are :

N.E. +·5, S.E. +·2, S.W. +2·0, N.W. -2·8 inches. So in this respect the accuracy is comparable with that of the Great Pyramid, although in size and squareness it is far inferior to that. On the stones may be seen red spots of paint left from the testing by a reddened trial-plate, as on the stones of Khufu at Gizeh.

12. The peribolus wall around the pyramid has been entirely destroyed, excepting the foundation stones in most parts, and the lower course of wall in the deep chip rubbish on the south side. In some parts even the foundations are gone, and their place can only be traced by the hole being filled with sand, against the chip and stone-dust bed which formed a pavement outside of it. Where the wall remains it is 57 inches thick. Its height was probably 70 or 80 inches, judging by a block of the causeway wall described further on. The outer dimensions of the wall were :

N. 8561 at -30'; E. 9307, +1'½;  
S. 8479, -27'½; W. 9300, -29'.

It will be seen (PL. III) that the E. and W. sides are practically equal, and the N. and S. azimuths therefore alike. But the N. side is longer than the S., and the E. azimuth differs from that of the other three sides; an error has therefore been made by the builders, the N. being too long, or the S. too short.

The relation of this enclosure to the pyramid is best stated by the distance of the outside of the wall from the middle of the pyramid base on each side; this distance is  $56^m$   $40^m$

on N. side 2203; E. 1420; S. 1393; W. 1420.

The design for the breadth of the peribolus is pretty clear, as 1420·4 inches is a quarter of the base of the pyramid, so that the enclosure was half as wide again as the pyramid. The space on the south may have been intended to be equal to that at the two sides. But for the extra space on the north side—about 780 inches more than the other sides—I fail to see any reasonable hypothesis. The peribolus entrance was led up to by a causeway; both of which we shall notice in connection with the temple.

A puzzling question is raised by certain groups of pitted holes, on the faces of the inner coats of the pyramid. They are in square groups of five each way, exactly like a modern *signa* board. And they are so high up that they cannot have been reached for some centuries. If they were ever used for

gaming-boards, like the many *siga* boards cut by Arabs, it could only be when the stones were lying with the face horizontal, before they were built in. Such is the view of Virchow, and of Reiss (*Verh. Berl. Anthropol. Gesell.* 16 Nov. 1889). On the other hand no instance of this game is known before Arab times; every old game-board that I have found being  $3 \times 10$  square. And it is most unlikely that workmen would be allowed to so disfigure the outer faces of finely-jointed masonry blocks before being built. I must conclude therefore that they were cut in Arab times, though it is hard to suppose that any game could be played on a face sloping at  $74^\circ$ .

13. The temple adjoins the east face of the pyramid. It is in the middle of the side, its axis being 2·1 inch south of the mid line of the face; and this is to be noted, as the east face is 16·7 longer than the mean of the other sides, so that the site for the temple was found by bisecting the face, and not by remeasuring an average half base along it; also it shews that the extra length of this face is not an error of the present surveying. It is built quite independently of the pyramid, not being bonded or joined to it, but merely built against it. The outer mass is plain and rectangular; excepting a slight batter of the outer sides, amounting to 5·5 slope inward on 90 height; and a rounding off of the top edge of the roof in a segmental curve, leaving a slight edge along the front. There is no other ornament, either of moulding, bevelling, or panelling. The whole building is absolutely perfect, roof, stela, and altar, all but small chips or flaking due to weathering. We cleared it over the courtyard, the interior, the roof of the chamber, and the front from the south corner to the door; but the rest of the front, the north side, and the roof of the passage were not examined. No stone but limestone is used in the whole building and altar.

The temple (PL. IV) consists of a passage, entered at the south end of the face, then a chamber, and lastly the courtyard adjoining the side of the pyramid and containing two steles, and an altar between them.

The door is 67·5 from the foot of the south wall, and is 34·0 wide at top, 34·4 in middle, and flaked below: it is 77·0 high, with a lintel 13·7 thick over it, below the roof slabs. In the passage the doorway is 7·7 to 41·8 from the south end; the passage is 48·0 and 48·5 at south, 45·2 at north, 236·4 east, 237·2 west. The exit door is 6·2 to 40·3 from the north end. The wall between it and the chamber is 42·5 thick at north side of door, 37·4 at top of south,

41·0 at base. In the chamber the east side has been dressed down too much all over the upper part, and left undressed below. The system of building being to lay the stones in the rough, and dress out the faces afterwards; so that each stone turned the corner somewhat when finished, as in the granite temple of Gizeh. The chamber entrance is 5·5 to 39·2 from north end; the sides at north 75·5, south 75·6, east 237·4, west 237·2 at top, 235 below: the exit door to the courtyard is 86·8 to 147·8 from north, or 61·0 wide. The E. wall of the court is 40·0 to 43·0 thick on north, 39·4 to 42·0 on south, being thickest at the base.

14. The courtyard is 237·0 long, and 92·0 wide to the foot of the pyramid; the side walls run on horizontally over the slope of the pyramid face, and so are 174 long on the top. The thickness of the side walls is 56, and of the front of the temple 58. Their top course is rounded in a flattish segment of a circle. The steles are flat-sided, with spherically curved tops, rounding over toward the faces as well as to the edges. The breadths of the north stele are, at base 40·7, at top W. 40·5, E. 41·0; of the south stele, base 41·5, top E. 40·8 to 41·5, edge rounded: the thicknesses of the north at base N. 20·3, S. 20·6, at top N. and S. 20·3: the height is 155·3 to the beginning of the curve, 165·0 to the top. The size therefore was 1 cubit thick, 2 cubits wide, and 8 cubits high, the top  $\frac{1}{2}$  cubit being rounded. The sides are dressed very fair and flat, and are set up well in a line, not  $\frac{1}{4}$  inch out of parallel. The distances from the sides of the court are 38·8 at north, 41·4 at south, leaving 74·6 between them. The distances from the east side of the court are 16·3 at north of north stele, 19·0 at north of south stele. These steles stand upon low bases with sloping sides; these bases project 9 to 10 inches from the steles, and are 2·8 high, so they are analogous to the bases beneath obelisks represented in early hieroglyphs, and reinforce the idea that the Mastabat Faraun at Sakkara may have been the base of an obelisk.

Between the two steles stands the altar of limestone, without any sculpture or inscription. It is 25·0 wide, and 54·0 long; the thickness is 10·7, but somewhat sloping and flaked; the spout is 14 long and 11 wide, with a hollow in it, and a groove irregularly deepened out on one side, as if due to corrosion of pouring out drink-offerings of sour wine and beer. The east side is in the east plane of the steles; and the north is 10·5, and south 10·7 inches to the steles.

The courses of the building run the same throughout. At the front the footing is 17 thick, resting on

desert pebble and sand, which also filled the space between the footings in the passage and chamber; the courses are 16·4, 32·8, 47·5, 60·9, 77·0, 90·7, 104·7 above the base. In the S.W. corner of the chamber the footing is 17, and the courses 16·2, 32·5, 48·2, 60·8, 75·0, and 90·0. In the north side of the courtyard, which is paved all over, they are 16·3, 33·2, 48·2, 61·5, 75·0, and 90·0. While the pyramid courses are 17·0, 38·0, 56·2, 70·3, 79·0. The stone is left rough in many parts; the excess left on in the chamber has been noted; and the roof edge at the courtyard is all roughly in excess. There is not the fine finish or exactness here which meet us in the later buildings of the IVth dynasty; but, as in the pyramid, the workmanship is solid and sound, though not refined.

15. The peribolus wall has a doorway (PLS. III, IV, VI), in the line of the entrance of the temple carried out parallel to the causeway; that is,  $3\frac{1}{2}^{\circ}$  askew to the peribolus wall. The doorway is 62 wide, at 5207 to 5269 from the north end of the peribolus; and the causeway at its head is 118 wide, 5202 to 5320 from the north of the peribolus. The space between the peribolus and the causeway is 180 wide. The thickness of the causeway walls appears to have been 66 at the base, according to the south side, but on the north the foundation is 75 wide. A fallen stone of the top coping of the causeway remains; it is of the whole thickness of the wall, and shews a width of 51·7 at 10·4 under the top, and 49·7 at the top of the face, surmounted by a circular curve 10·1 high; this shews a batter of 1 in 10 on the sides; and hence, if the base was 66 wide, the wall was 90 inches high over all outside. But the causeway was somewhat sunk below the ground level in parts, being flat, and independent of the contour of the ground. Its general direction is plainly ruled by its lying in the bottom of a small valley in the edge of the desert; it runs down to the plain, and may go some distance further, but my men were stopped by the water. If this construction were tracked down to its original end it would give us a valuable datum for the rise of the Nile bed during some six thousand years; but such a research would need good pumps.

16. The inscriptions in the temple are none of them due to the builders. The earliest is a scratched graffito (XXXII, 1) on the north wall of the chamber: this is so exactly the colour of the stone, and so uniformly covered with a slight salt coat that I did not observe it until making a final search. It is certainly far earlier in its condition than the two

scratched graffiti (XXXII, 2, 3) on the east wall of the chamber. As the latter appear to be of the XIIth dynasty, by their style closely resembling the Assuan graffiti of that age, it seems probable that the earlier one is of the VIth dynasty or before that. All three of these graffiti are within the light from the courtyard, and shew that that was open till after the XIIth dynasty. The other graffiti are all ink-written, facing the front entrance to the temple on the west wall of the passage, and some on the sides of the doorway. They are all of the XVIIIth dynasty: and the reader should refer to their translations by Mr. Griffith in Chap. VI. On the front of the temple are three very rude graffiti of ships by the door.

The temple contained about two feet of blown sand. It was evident that the courtyard had been choked between the XIIth and XVIIIth dynasties, as all the later graffiti were within the light of the outer door, and pieces of burnt papyrus plant strewed the chamber floor, having been taken in by persons wishing to see the blocked doorway into the courtyard, which we found much smoked. In this sand in the passage was an interment of the XVIIIth dynasty, with some beads, two small bronze lance heads, and some pomegranates and nuts. This burial explains why I found the outer doorway carefully blocked with pieces of stone: evidently the passage was looked on as a convenient sepulchre, and the door was blocked, and covered with rubbish. And this heaping-over of it probably finished the hiding up of the temple, which had been nearly covered before by blown sand and fallen pieces of stone from the pyramid. Thus it was mainly out of sight when the pyramid was attacked for stone, probably by Ramessu II, and it was thus saved from being destroyed. Certainly the pyramid was largely pillaged in the XIXth or XXth dynasties, as the burials of the XXIInd dynasty in the rubbish are high above the temple level, some 20 to 30 feet up.

In the sand in the passage were a few objects, probably of the IVth dynasty. Four stone hawks and one in blue glazed pottery (XXIX, 1-5) seem to refer to the worship of "the Horus Snefru," as he is called in the inscriptions here. The most interesting piece is the base of a statuette in hard black serpentine (XXIX, 6): several curious points of the inscription will be seen in the chapter on inscriptions, here we need only note that it is dedicated to the gods of a town called Tat-Snefru by a woman named Snefru-Khati. The lower part of a basalt stand (PL. XXIX, 7) was also found, in the courtyard.

We see then that a statuette, probably almost contemporary with Snefru, was placed here, referring to a person and a place named after him, shewing that he was the genius of the neighbourhood. Next, not later probably than the VIth dynasty, a visitor scrawls up "Thrice good is the name of king Snefru." And in the XVIIIth dynasty, we find that his festival was held here, and all visitors recognised this as his pyramid and temple. Such a chain of evidence gives the final precision to the general inference that the cemetery is of the IVth dynasty, judging by the nature of the pottery found in it.

17. On the south side of the pyramid a strange excavation was partly examined. I observed when first walking round the pyramid that there was a stretch of high ground between the western part of the south face and the peribolus. As it was formed of limestone chips I concluded that some great building had stood here, within the peribolus. Accordingly I began sinking trenches in the site, and found some large blocks of stone, below the level of the peribolus pavement. As the blocks were too large to move in a trench, I then made a wide square clearance, piling up the blocks around it when they were too large to move out or to break. The depth was about 25 feet, through hard concreted chip and lime-dust. I thus found the side of a square pit in the rock, within which a building had been constructed: the building must have been of considerable height, judging by the great mass of chips resulting from its destruction, and also covering a fair area, although I only saw about 15 feet of the pit in each direction. The pit is about eight feet deep in the rock, which is here about six feet under the pavement; and the floor of the pit is flat dressed in the rock. A tunnel roughly cut in the rock leads southward from the pit; but is broken away above, and filled in, at 24 feet from the pit. What the purpose of such a building can have been is doubtful. No temple is known on the south of a pyramid; and neither for that, nor for a small pyramid, would such a rock pit be needed. That it was not solely a subterranean structure is proved by the great depth of resulting chips. It would be desirable to clear it completely; but the depth and hardness of the material, and the absence of a single stone left *in situ* so far as I went, dissuaded me from working further.

18. One detail of the pyramid's exterior, perhaps connected with the position of its chamber, was noticed before I began to excavate for the temple, and influenced my excavation. On the eastern faces of the

upper two steps a slight groove or recessing may be seen, especially when the sun is near noon (see PL. II). Judging from below the recess is about an inch deep on the face; and by angular measurements the upper groove is 211 inches wide, and the lower is 195. They are not exactly one behind the other; the distances from the north base being 2991 to 3202 inches for the upper, and 3020 to 3215 for the lower. They are clearly excentric on the faces, and as the temple is centred on the face they cannot be connected in any way with that. But the sepulchral chamber is about 2918 to 3151 south of the north base, which is not far from the position of the grooves, about 60 inches different to the upper groove. As the sculptured chamber with the *ka* statues is often placed in mastabas east of, or before, the sepulchral pit, and as the facade of that chamber always forms a recess on the face, it is not impossible that this shallow recess is a signal of the position of the *ka* chamber, thus carried upward in the building, and repeated on the outer coat, as we find the false door repeated approximately (though never exactly) in front of the inner chamber. If a *ka* chamber exists—and it would be strange if the king had not a better provision in this way than his subjects in their mastabas—it is doubtless on the east face of the innermost mass of the mastaba form, the first block built.

19. Having now described the exterior we proceed to the passages and chambers. The entrance was uncovered, and the passages partly cleared, by Prof. Maspero's workmen in 1882. The floor of the entrance passage begins at 574·8 inches horizontally from the middle of the north base, and 720·7 above the pavement at that point (see PL. II). The passage is 62·5 inches high, at right angles, being built of three courses 21·0, 20·0, and 21·5 high: the floor is 20·2 thick, and the lintel 25·8 thick. The width is 32·2 at top, and 34·3 at base. The entrance was apparently closed by wedges of stone. The block filling the lower course was probably keyed into that of the middle course: this one was secured by the sides of the passage being cut away sloping inward, so that the block could wedge tight; the upper course block was tapered in thickness so that it wedged between the middle block and the roof. Further in, at 326·3 measured along the floor, there is on each wall a joint rising at 75°, the face of the outermost mastaba coat; the remains of a doorway fastening may be seen in this coat; the roof is higher by 7·3, for a length of 48·2; and on each side are two D-shaped holes, 14·6 from the outer face, and 12·7–16·7, and

55·7-59·6, below the roof. These probably held metal bars, against which rested a slab of stone filling the doorway, until the outer coat was finished, and the entrance wedged up. At 516·1 from the entrance is the face of another mastaba coat, also at 75°, on either wall. Below this no joints could be found that were not square with the passage. The whole passage is built of masonry, and never enters the rock, contrary to some accounts. But the salt has so violently scaled the surface of the stone, that it is exfoliated into a circular cavernous form, and it is only by referring to the joints that the plane of the roof can be observed. The upper part of the passage, and particularly the region of the outer casing coat, is of excellent stone, clean and smooth. The tool marks can be plainly seen—short, small adze strokes. And the system may be traced whereby an excess was left on the edge of the face until after the stone was built in, when it was dressed down so as to insure a smooth surface across the joint. The joint thicknesses are very fine, much under  $\frac{1}{100}$  of an inch.

At a length of 2247·6 inches the sloping passage ends, and the angle of it, observed from the entrance to more than half-way down, is 28° 48'. Hence the end is 2544·4 from the north base horizontally, and 362·1 below the base. But the floor itself was not seen, owing to the large amount of exfoliated sheets of stone which more than half fill the passage.

20. In the horizontal passages and chambers which follow this, I have had the whole floor cleared and thoroughly examined, a portion at a time, to make certain that no other passages exist below those. The roof drops 2·9, and then proceeds horizontally in one plane until reaching the well which ascends to the sepulchre. The chambers here are 69·5 high. First there is a widening of the passage on the east, immediately it becomes horizontal; thus forming a chamber 82·7 wide (instead of the passage width of 30·7), and 103·3 long. Then for a short way of 21·5 the passage is normal, and afterwards widens on the west into a chamber 83·6 wide, and 103·4 to 104·2 long. These chambers are all lined with masonry. Then a passage, still in the same line, goes south for 146 inches to the well, making a length of 374 in all. The floor of this last piece is broken up, leaving rough rock, with a trench or groove along the middle of it; and the lower part of the well is rough rock, the upper part being lined with stone, which is supported at the sides by large beams or wall plates of wood, still in place, and still sound, though saturated with salt. The floor of the sepulchre is also of rock, covered with

a thin paving which is now mostly torn up. Hence the rock rises to about 130 below the pavement, and the lower passages must be built in a trench in the rock.

The well in the lower part is 36·3 on E., and 30·5 on N.; while above it is 46 on E., and 40½ on N. Its height, from the roof of the passage to the pavement of the sepulchre, is 174 inches. The well rises in the extreme N.E. corner of the sepulchre floor, which is 233 on the W. and 104 on the S. side. The E. and W. sides of the chamber close together rapidly upwards in a series of overlappings, formed by the projection of successive courses of stone. This is a standard form in the mastaba chambers of this place, and is seen in the gallery of Khufu's pyramid. These overlappings are at 41, 63, 86, 107, 131, 155?, 180, 204?, and top 225? above the pavement of the chamber; the widths of the chamber being below the laps 104, and then 91, 80, 64, 53, 36?, 20?, 4?, the top space being irregular, and the stones almost touching in parts. That this really was the sepulchre is shewn by our finding thrown down the well the pieces from a wooden sarcophagus, of the early plain style, which had been very violently wrenched open and destroyed. The position of the chamber is 2918 to 3151 from the N. base, or 76 to 309 south of the middle of the pyramid. The azimuth of the passage being 21' 33" west of north, it is very nearly that of the pyramid sides, the deviation being about 2 inches: hence the chamber sides would be 42 E. and 62 W. of the middle of the pyramid. The pavement of the chamber is 119 under, and the top 106 over, the north pavement.

## CHAPTER II.

### THE MASTABAS AND BURIALS.

21. The earliest mastaba of importance appears to be that at the north-east of the pyramid, No. 17 Plan, PLS. I, VI. As it is the largest but one, and the simplest in construction, we will consider it first. Its outside was built of large crude bricks, the body of it is formed of clean chips of limestone, evidently the waste from the building of the pyramid: it is therefore most probably contemporary with the pyramid. It differs in internal arrangement from the other mastabas; and it has no sculptured chamber, opening to the outside, but only a plain stone facade opposite the sepulchre, on the east side. It also differs from others in having been built entire at once, and without any subsequent coating or addition.

The outer faces slope at the characteristic angle of mastabas,  $76^\circ$ , or an angle of 4 vertical on 1 horizontal. And the walls do not rest on a level foundation, but are carried down to reach a rock bed. This was found very markedly on the north side. Seeing that there was a mass of clean chips outside that face, I thought that it might cover an entrance; we therefore began clearing it out, but found the face slope down without any opening until the rock was reached about 20 feet below the ground level. While examining the N.E. corner, in clearing it for the survey, a very curious wall was found outside it, and similar walls were found on searching at the other corners. As remarked, the faces slope down to the rock, and hence it would be very troublesome to lay out the building with sloping faces on an irregular level, so as to bring it to the dimensions required at the ground level.

22. The laying out was therefore most carefully arranged, on a perfectly true principle. Outside of the corners vertical walls were built from the rock up to the ground level of the intended mastaba (see the four "corner walls" on the plan PL. VIII). These walls are of L shape, running in front of both faces at each corner; they are of crude brick, plastered, and whitewashed, to shew up the construction lines. Levelling was then carried around the site, and all the inner faces of the walls were divided by horizontal lines into spaces of a cubit high (see PL. VIII), the deep wall at the N.W. having as many as nine cubit levels still marked on it. Vertical lines were then drawn on the walls, in the planes of the ground lines of the intended faces; e.g. on the two northern pieces of wall, at N.E. and N.W. corners, the vertical lines were 2065 apart, the intended breadth of the N. face at the ground level. Then from the intersection of these vertical lines with the ground level, sloping lines were drawn down outwards at the intended angle of the face. Thus at each end of the face was a slanting line defining its plane; and it was only needful to place the eye on one line and sight the brickwork in a line with the line at the other end, to know that it was in the intended plane. Such was evidently the principle, of which the evidences remain at each corner. But for some reason a second sloping line was added outside the first, and the building was thickened out to that. It is impossible to suppose that the ground level was at the intersection of the outer line with the vertical, though possibly that level was marked on the mastaba side now destroyed: and it is equally impossible not to regard the vertical lines as the intended dimension of the mastaba, as the breadth is

exactly 100, and the length 200, cubits. So we can only suppose that the mastaba face was built one brick thicker than at first intended.

The construction lines, vertical and horizontal, and the inscriptions referring to them are all in red. The working lines are in black. All the broad lines were marked by two narrow edges, filled in between by brush-work. The faces of the mastaba are exactly in the plane of the outer edge of the outer line; so thus the wide line could be easily seen from corner to corner, while the work could be formed with precision to its outer edge.

Turning now to the details of each corner, at the N.E. the cubit lines are 20.5 apart, and .3 thick; the black lines are 3.2 wide on the north, and 2.4 on the east; the red vertical is 3.2 on north, and 2.6 on east. The mastaba faces differ from the outer edges of the black lines by being .3 inside on the E., and 1 on 200 flatter angle on the N. The wall is 17.6 thick; it was somewhat broken down anciently, as the clean mass of stone chips overlies the broken top of the wall; and it seems as if the bricks had been carried off, leaving the plastering projecting alone. This corner is in brilliant condition of colouring.

The S.E. corner wall is somewhat decayed by damp, and the colour a good deal injured, but the same system is quite clear. The red vertical on the east wall has been altered, being re-drawn at 1.6 further out; the black lines evidently belong to the later line. The black lines vary from 1.9 to 2.6 wide, and the red are 2.1 and 2.3.

The S.W. corner is very much decayed by rain; the red cubit lines are mostly effaced; the S. red vertical appears to have been altered like the line in the S.E. corner; and on the west wall no trace of a red vertical can be determined, only a patch of red which by its position may be part of the vertical, but which looks on the spot more like part of a red triangle. The corner of the walls is not continuous, each wall standing separately. The black lines are 2.4 wide.

The N.W. corner is far the most important. The rock bed was here 21 feet below the ground, and a high wall was therefore needed to set out the construction lines. The perspective view of this corner is shewn on PL. VIII, supposing the mastaba corner to be complete at some height above the ground, in order to render it clearer; in reality the mastaba outer face is all broken away above the ground. This corner bears inscriptions relating to the levelling. In the fifth cubit space below the ground level we read at each side, "cubits five under of the *neferu*." The



technical word *neferu* for ground level does not seem to be yet known; but its meaning is clear, and it refers to the "finished" or "completed" surface. Similarly in the eighth cubit space is "cubits eight under of the *neferu*." The walls are not quite true; the west wall projects forward below, thus reducing the breadth of the north wall; and the north wall recedes somewhat at the top part, thus increasing the width of the west wall; hence the crossing corner lines in the diagram. The levelling is marked in certain parts particularly by a red triangle, a sort of bench-mark which is well designed, and may be seen in other Egyptian work. The black lines vary slightly in width, but the average is 2.4 for the inner and 1.6 for the outer lines; the red verticals are 2.5 wide below, and 2.2 above. The level lines were drawn independently on the walls, and differ .1 or .2 at the corner; they are about .2 wide.

23. From these construction lines we have of course a good evidence of the cubit. It is the usual royal Egyptian cubit of 20.6 inches. The heights of the cubit spaces are changed on the walls by the compression of the brickwork, and the plaster is buckled off the wall in parts by its not being compressed in the same manner. The lower parts shew more compression than the upper, and the mean of all is 20.36, varying from 20.0 to 20.5. But, as we have already mentioned, the angle of slope is 4 on 1, and therefore the black lines extend  $\frac{1}{4}$  of a cubit further from the red at every space. Hence there is another set of cubit values, given horizontally, which are independent of the vertical compression. There is no doubt but that they were measured out from the vertical, and probably the outer edges of the red and black lines are the more correct parts to observe. The distances measured are, on the west wall 20.5, 30.6, 41.2, 51.5; and on the north wall 20.3, 30.8, 41.1, 46.4, and 58.0. This last is clearly excessive, but the mean cubit value from the eight other measures is 20.54 inches. Even this is probably somewhat reduced by the contraction of the brick and plaster in very slow drying, as I have found in a tomb the gesso coat of fresco work much buckled off the brick and mud backing owing to the contraction behind.

The best data of all are the dimensions of the mastaba shewn by the distances of the red verticals apart. Owing to the very disturbed state of the ground I could only measure this trigonometrically, and owing to the distance of the stations observed this is not a certain result within a few inches. It yields, however, between the outer edges of the

red verticals N., 2065; E., 4121; S., 2063; W., 4,124; and hence a mean cubit value of  $20.627 \pm .007$  inches, which is very closely that fixed by the most accurate datum in Khufu's pyramid,  $20.620 \pm .005$ . The errors of squareness are considerable in this mastaba, the S.E. and N.W. corners being blunt, and the N.E. and S.W. corners sharp, by about 24'. The average azimuth of the E. and W. sides, which were doubtless those fixed astronomically, is 12' W. of N., which is only half the divergence of the pyramid azimuth.

The levels of the lines at the corners are related thus: the N.E. is 6.5 high, S.E. is 4.7 low, S.W. is 2.8 low, and N.W. is 1.0 high. There is then an average error of 3.7 inches, which is more than double the error made in levelling the longer base of the Medum pyramid. This shews that levelling was a matter which tried their skill; the error here is 1 in 400, which might occur either by horizon observation, or by plumb line levelling. The bricks had all been splashed with yellow wash, when stacked before being used, in order to prevent any thefts; just like the bricks of Hawara, and the coals in a modern depôt.

24. The interior of this mastaba has not been entered in modern times, and the position of the chamber is yet unknown. On the east face will be seen a stone facade on the plan, near the south end. This has a stone paving before it. It was opened up by Prof. Maspero's workmen in 1882, and left open; consequently nearly all the stone has now been carried away. There was no sculpture, nor even a false door, on it. When I cleared it again I found at the north end of it a forced passage in the loose stone chips which form the body of the mastaba. This I had cleared out for some distance, when it turned downwards, and could not well be worked in, owing to the looseness of all the material, and an old forced well which opened into it, and was full of loose stuff. I had already scraped off the surface of the mastaba on the top all along the middle, down to clean firm chips, to search for a well, but in vain. I then sank a large square pit with winding stairway, in the axis of the mastaba, reaching from about the middle to near the latitude of the N. end of the facade. This pit we carried down to 48 feet under the top—a considerable work; but we neither reached a central chamber, nor any passage leading to the chamber, as I had hoped we might have done. The old forced passage just mentioned was opened out north-west into the pit, for safety of working, and was then cleared of loose stuff, but it proved to have been abortive, as it ceased

in the mass of filling, without reaching the chamber. An indication of the chamber was however reached, as a brick wall was found in the bottom of my pit, with a plaster lining and a red line on it, facing south. This is doubtless part of a guiding wall for the working lines of the chamber, like the walls at the corners of the mastaba. And this shews that the chamber is about behind the facade, and E. of the axis. A long sloping face of dry stone walling rises up above this brickwork, evidently the retaining wall to keep back the upper stuff while working, as this hole is about 20 feet below the pavement. These details were only found in the last week of my work, and I had not time to undertake the heavy task of clearing away another large mass of stuff 48 feet deep to lay bare the chamber. Where the regularly built entrance is we cannot tell: there is no well on the top, nor any passage leading into the chamber from the north, as there is in other mastabas.

The whole length of the east side was laid bare and examined in search of any other facade or false door, but it was all made of smoothly plastered brick. The outside of the brickwork had been a good deal weathered and destroyed down to the ground level, and it was then tunnelled into for graves in about the XXIInd dynasty; the bodies were much swathed, occasionally in wooden coffins without inscriptions, but there were no objects with them, except once or twice a few beads.

25. The largest mastaba of all, however, is No. 16 (PLS. I, V), that of Nefermat and Atet. And first we should notice that in each of the great mastabas here there are two false doors, one near each end of the east face. In No. 8 they are only plastered, and plain; in No. 9 the stonework is nearly destroyed; but in Nos. 6 and 16 we see that the southern door has the master on the panel over it, while the northern of No. 6 has the mistress and master, and that of 16 has the mistress alone, while she is also represented as the main figure of the lintel. Thus it is clear that the northern door was that for the worship of the mother, while the southern is that of the father.

Hence to avoid confusion between the two false doors I have called the southern ones by the masters' names Nefermat and Rahotep, while the northern ones receive the mistresses' names Atet and Nefert. The illustrations therefore of PLS. IX-XV. are all of one mastaba, No. 6; and those of PLS. XVI-XXVII are all of one other, No. 16. The variation of the azimuth of the mastabas from that of the pyramid is

verified by magnetic bearings, besides the survey; the Denkmäler plan is therefore in error.

The outer part of No. 16 is of small bricks, and it has been enlarged by a thick outer coat (see detail, PL. VII). The body of it is of layers of Nile mud, poured in and left to harden before a fresh mass was applied. It is thus full of large cracks which extend far in all directions, which conduct currents of warm air out whenever excavations are made, and which form the home of serpents. The top is coated with 3 to 5 feet of gravel and sand, to sponge up the rain, and prevent it penetrating.

I endeavoured to find the well, or entrance to the chamber, during some weeks of work. The top coat of gravel was removed, and the mud body tested from end to end all along the axis; in the middle, around which Mariette's men had made some wide digging, I cut down to about 20 feet deep, and at the northern part in the axis, behind the north door, I also went down 20 feet deep. But only the same layers of Nile mud were found. I also cleared the N. end down to the ground, but found no trace of an entrance. When I cleared the south door I found a forced hole below it, which led into a forced passage; this ran N.W., but ceased before reaching the axis; it was quite empty and clear, 6 ft. high and 3 ft. wide, entirely cut in Nile mud without any sign of other material. At the north door a forced passage has been cut in the south end of the cross space; but as it was choked, and I did not know, before I covered it over, with what skill the plunderers sometimes cut for the point of burial, I did not examine it. It became needful to cover this facade soon after I had cleared it, as the salt in the stone deliquesced with the dew, and was destroying the remaining colours. The burial chambers of this mastaba are therefore at present unknown.

The false doors and *ka* chambers here are facades of stone, with a deep recess or chamber, closely alike, Atet's being slightly smaller. As to the sculpture, that will be noticed in the next chapter. The grand masses of which Nefermat's chamber is formed are striking. The back is all one block, over 156 inches high, 50 wide, and 41 thick, weighing therefore about 8 tons; the sides are 135.5 high, 111 average width, and 40.4 thick, about 20 tons each; and the top is all in one block across, 245 long, 97 deep back, and 41 thick, about 33 tons. These shew a fine mastery in the art of using heavy blocks, and we must remember that they are older than the pyramid of Khufu, and as early as anything yet dated. The chamber thus formed was 95.5 long at top, 137.4 at



base, varying according to the slope of the facade; 50·0 wide at back and 56·5 in front, and 135·5 high to the under side of the drum, or roll across the top, or 155·7 to the space behind the drum. These dimensions are not in even numbers of cubits, although the cubit was evidently used in the thickness of the lintel and sides, and depths of the drum. In the plan (PL. VII) it will be seen how the front of the stonework, or facade, is left exposed by a short cross passage, the other sides of which are composed of brick. It seems possible, as a sloping joint is seen on the ends of this passage, that the facade is in the true face of the first body of the mastaba. That was coated over with brick, leaving the facade clear, and a passage to lead to it, which was lined with coloured frescoes. And then a second coat of brick formed the present outside, with a mere niche or false door to indicate the place for offerings. A court was also built in front of this, as we shall notice in the Rahotep mastaba, and this court is analogous to that of the pyramid. The fresco had nearly all perished, and I only saw the lower part of Atet, clad in panther's skin with striped border, and of Nefermat walking in front of her. The fresco over the lintel had fallen from the wall in early times, and part of it was found lying at the foot along with some wood that had formed the roofing of this cross passage. The fresco is shewn on PL. XXVIII.

There is a difference between the brick faces in all these mastabas. The inner is quite plain, white plastered; while the outer is all in panels, or rather a row of small false doors, as an ornament. The angle also differs; the outer is  $82^{\circ} 10'$  on the E.: the inner  $69^{\circ} 40'$  on E., and  $72^{\circ} 20'$  below,  $70^{\circ} 0'$  above, on the N. The maximum height is 385 inches, probably 10 cubits (412) originally; and the outer coat rises to 260, but is greatly denuded, so that it probably extended to the top. The panelling on it is in groups; wide niches of 2 cubits (41 ins.) are flanked by a narrower one on each side, and each such group is recessed from the general face, which has three narrow niches between the groups. By the measurements there must be 28 large niches in the length, and 15 in the width, of the mastaba. The inner body is 2474 inches on N. and 2470 on S., 4550 on E., 4554 on W. Probably 120 cubits (of 20·60) and 220 cubits (of 20·69 inches). The outer coat varies in thickness, 97 on W., 101 on S., 115 on N., 119 on E., to the outermost parts, and to the continuous ground level step from which the niches rise.

The chamber of Atet is of less grand blocks, the

top being partly compound, and the dimensions being slightly less. The stone has moreover suffered greatly by scaling in the inside. The chamber is 47·4 wide at back, 47·5 at top of front, 46·2 at base: 106·5 long at base: and 127 high to under side of drum, or 148·4 to roof. I should state that Mariette's plans of this and other mastabas are all in error by his confounding the different coatings of the mastabas, and measuring between an inner face on one side and an outer on the other. This is certain, as I found that only one or other face had been discovered on different sides.

26. No. 6 is very similar in design to the above. The body of it is, however, all built of bricks throughout, and is now about 260 high, after most of the gravel top is gone. It will be seen on the plan that it was at first symmetrical; 2060 long, and 1330 wide, with a central pit, two false doors on the E. face, and a second pit nearly behind the north door. The innermost S.W. corner inside this is a division in the mass of brickwork, which can hardly have any designed meaning, as it runs too close to the chamber. Afterwards it was enlarged on the south, and west, and a large addition was made on the north, marked as the "annex." Then a coat was run all round it, making it 3207 long and 1548 wide; and lastly a second coat 97 thick was added over the E. face, to further hide the chambers. The angle of the inner body is  $76^{\circ} 40'$ , the 1st coat  $73\frac{1}{2}^{\circ}$ , the outer coat  $73\frac{1}{4}^{\circ}$  on the E. face.

The *ka* chamber (see PL. VII) seems to have been designed after that of Nefermat, as the cross-passage, which was a mere accident of development there, has here become an intended feature, embodied in the masonry, and covered with carving. Within this chamber stood the statues of Rahotep and Nefert, now in the Ghizeh Museum; and the doorway was entirely blocked with masonry cemented into place when Mariette's workmen found it, the chamber being intact. After cutting out the blocking, and removing the statues, and apparently taking wet squeezes from the coloured walls—thus ruining them—the doorway was earthed over by the discoverers. Never being inspected, some traveller chose to unearthen it, soon before 1887, which date is written in the tomb; and it has stood open since then, with the result that every face within reach is mutilated, most of the figures spoiled, and all the edges of the stone broken away. I completely reburied it. The sculpture on the side walls is much cut away to insert the blocking, and as similar cutting is seen on Nefermat's walls, it is almost certain that statues of him and Atet existed

in his chamber. There is no such trace of blocking in Atet's chamber.

In front of the false door which is in the outermost coat of brickwork a courtyard was built, which contains two steles bearing the inscription on PL. IX, which does not contain the name. Mariette's description is erroneous in stating these to belong to another mastaba built against the E. face of Rahotep's, to which he gives the name of Ranefer as well as to No. 9; the coat of brickwork was mistaken for a fresh mastaba, in this, the only place where it was noticed. These steles are 18.0 to 18.2 thick, 23.2 wide, and measuring from the roughened expansion at the base they are  $103\frac{1}{2}$  high to the beginning of the curve and 110 to the top, being formed like those of the pyramid temple (PL. IV). In the court of offerings were many small vases and saucers, like those found at the E. of the pyramid and before other tombs here. At the base of the niche of the false door at the back of the chamber is a pit cut in the stone, apparently intended for pouring down offerings. It is so rough that it may have had some fine stone edging now removed.

The false door of Nefert is much less important, being merely a niche, with an unsculptured facade on either side of it.

The central pit of the mastaba had been furiously searched for by Mariette's men; they dug vast holes in the brick body, but never cleared the top; and a trench of theirs cut away one side of the well, without their seeing it. In course of clearing their cutting to examine it my men found the well. It had stood open for ages, and was deeply furrowed with rainfall on the sides. The west side was so rotten that I had to remove a coat of brick from it before clearing the pit. The section of the pit is given in PL. VII. The sides of the pit have a groove on each side to hold a great stone trap-door slid down to the bottom. Some way down we noticed a hollow on the south side, and opening it found a relieving chamber in the brickwork, at the ground-level. The short passage leading to this is curious for having two slight arches built in it (see PL. VII) to relieve the thrust of the overlapping sides. This true arch is important, as it carries the use of it back from the XIIth dynasty to the IVth. This chamber and passage we completely cleared out, but found nothing in them.

Descending further we came on the top edge of the trap-door, which I did not then understand clearly; but suspecting a chamber beneath the relieving chamber, I cleared the well thoroughly first, in order to be able to throw the rubbish from the chamber

into it. In the well were 41 blocks of stone, averaging  $10 \times 10 \times 15$  inches, about 1 cwt. each; just as much as I or the men could conveniently lift and carry about. These lay loosely and had evidently been the filling in of the passage leading to the chamber. Beneath these was a copper adze in the dust 10 inches over the bottom (PL. XXIX), which must therefore be as old as the first plunderers of the old kingdom; and also the red pottery pan (XXXI, 21) with a spout, in which the men had mixed their plaster when closing the passage with the masonry; for no one would mix plaster down there at a later time. The adze may also have belonged to them.

Then clearing down between the shifted trap-door and the wall we found a mummy interred there later, and the passage leading to Rahotep's chamber. The chamber was quite empty, and all the traces found are some curved wooden bars of the inside of the coffin, and some scraps of fine gauze, like that afterwards found on Ranefer's mummy. The bottom of the sepulchre is rock, and there was about 20 inches depth of large flints, or very coarse desert gravel, laid on it, all of which we turned over. Perhaps this was a substratum to the floor, to serve as a sponge in case of water getting down the pit, so that the body might be preserved dry above it. Alas for the body! —where is it?

A very curious point of construction is the woodwork employed. In the sides of the well are wooden beams occasionally; just as wooden corner beams, and a tie running into the wall, are found on the N.W. corner of mastaba 17. And in the solid mass of brickwork of Rahotep's mastaba are logs of trees built in, nearly upright, and 8 or 10 feet long, to serve to bind the material. So ramifying are some of these that I thought at one time that a whole tree had been built around, but a log was wrenched out one night by the villagers, proving its isolation.

The second well was doubtless that of Nefert, being behind her false door. It had been plundered anciently and a crater surrounded it. For I may say that Mariette's statement that there was no trace of any pits on these mastabas is quite wrong; nearly all shew large pits of successful or unsuccessful plunderers, on the top. We cleared this pit to a great depth, over 40 feet below the crater top, as it is far deeper than Rahotep's. We reached the chamber, but unluckily a snake dropped down, and the boys were afraid to work it, having seen him just under their feet one day. As it was plundered and had stood open for ages, and was in a dangerous condition at

the sides, I then did not think it worth much more trouble to proceed with it.

27. The annex is a very unaccountable piece of work. It is certainly contemporary with the other part, as the outer face is continuous; but it is built on to the white-plastered N. end of the mastaba, and is 830 long without the outer coat. On the E. side of it is a false doorway in the brickwork, white-plastered. Above this in the mass of brickwork were two parallel joints, marking where a space or passage had been left (see PL. V), and filled up later with brick. This I cleared out, and found it did not go lower than the top of the false door; and on proceeding inwards the base of this filled space rose upward, and came to the top of the mastaba at about the middle. There was no sloping floor to it, only the parallel joints ended and there was continuous brickwork below them. The lower part of the space was filled with large broken pieces of stone. It certainly seemed as if it would lead to some unopened chambers. However I cleared it completely without any clue. I then cut about all over the top of the mastaba and searched the brickwork everywhere, to see if any filled up pit existed, looking for continuous joints in the brick, and cutting about 6 feet deep all along the axis. Nothing was found. I then sank a pit through the solid brickwork at the end of the blocked space, and in the axis. Nothing but brick was met with above ground. But a round pit was found in the ground, filled up with broken brick and mud. This seemed very promising. It went through the gravels for 13 feet, then soft rock for 2 feet, and then into harder rock, where  $3\frac{1}{2}$  feet further it ended, with a flat bottom, rough picked, 39 inches across. There was nothing but brick and rubbish in it, and the object of making such a pit for  $18\frac{1}{2}$  feet seems inexplicable. Together with 25 feet of cutting through the mastaba, our pit was  $43\frac{1}{2}$  feet deep. Beside the false door there was another curious indication; above the false door, a little to the south was a hollow in the brickwork, 33 inches deep, 29 E. to W., 70 N. to S., and 90 to 120 inches inside the outer face of the brickwork. This hollow was full of sheep's and goats' bones, as if sacrificed and thrown in there. A similar hollow full of ox bones was found near the top of Ranefer's mastaba, a little N. of the N. doorway, about 10 feet back from the back of the doorway. It was there close to a sepulchral pit, and offering chamber; yet in Rahotep's annex no trace of such a pit or chamber can be found.

28. The only other tomb with remaining sculpture

is what I have called Ranefer's, No. 9. The portions of figures, PL. XIV, do not yield any such name. But Mariette states "des deux chambres, du sud et du nord, il ne reste que des pans de mur démolis au milieu des quels nous avons pu recueillir le nom du personnage" Ra-nefer. His account is so very incorrect in other points that I do not feel much confidence in this statement; but as much stone seems to have lately been removed from the south doorway, and only small chips are now left, whatever ground there was for the above attribution is now lost. The matter is complicated by Baedeker's account which describes, apparently as being here, a fine complete chamber with very curious and interesting sculptures, lassoing a bull, making of sarcophagi, and an altar of offerings, for Khent and his wife Mara. There is no possible site for such a tomb except at the lately destroyed stonework of No. 9. Yet Mariette says nothing whatever about it, and attributes this to Ra-nefer according to mere chips that were found. Probably this note about Khent and Mara has been entirely displaced in the guide book, and refers to elsewhere.

The plan of the *Ka* chamber, or false door, at the N. of Ra-nefer will be seen, PL. VII: the coat of brick filled up the stone recess, and has another recess in it. The body of the mastaba is, at the base, 1146 on N., 1161 on S., 2161 on E., 2084 on W. The coat of brick on it is 60 to 65 thick on the E. face. On clearing at the middle of the top we found the well, under about 5 feet of gravel. It was wide and quite intact, and took a fortnight to clear out. The stone trap door like Rahotep's was duly in position; and we cut away the side walls and levered it carefully over so as to get behind it, and found a passage blocked with solid masonry. Mr. Fraser, who happened to be visiting me, cut this out with hammer and chisel; when I went down I found only one stone in the way, I wriggled it out, and crawled into the hole, looked over into the intact (!) chamber, only to see a great black hole in the floor. It had been burgled by cutting a tunnel from the back of the south false door straight to the chamber, and breaking away the floor. The plan and section of the chamber is in PL. VII. Ranefer's mummy lay hitched up against the west wall, on its left side, head north, facing east; the head had been broken off by the violators, but carefully replaced, with a stone under it to support it in position. The wrappings on the body were also torn up. The mode of embalming was very singular. The body was shrunk, wrapped in a

linen cloth, then modelled all over with resin, into the natural form and plumpness of the living figure, completely restoring all the fulness of the form, and this was wrapped round in a few turns of the finest gauze. The eyes and eyebrows were painted on the outer wrapping with green. The mummy is now in the Royal College of Surgeons. There was no trace of a coffin of either stone, or wood; and certainly none could have been dragged out through the hole. Even if a wooden coffin had been broken up it is unlikely that no bits of it would remain.

In the recess in the south end, similar to that in Rahotep's chamber, there were parts of the internal organs embalmed, forming lumps of resined matter wrapped round in linen, and fragments of such were in Rahotep's recess. Some insect had lived on it for generations, and the place was deep in the cast skins. There was no sign of these organs having been in jars or enclosures; and it seems as if these recesses in the tombs were intended to lay the internal parts on after embalming, before the use of jars for such was introduced.

On making further search a second well was found toward the north, doubtless that of the wife, like the well behind Nefert's door. This had been plundered anciently, and stood open for ages. We cleared it to the chamber, but that was so large and full of rubbish, that—as the well was rather dangerous and time short—I relinquished it.

29. No. 8 is a smaller mastaba, without any coating at the ends, as it stood too close to the others to allow of it. The body is 1607 on E., 1610 on W., 614 on N., 616 on S. In all these mastabas, although the actual base was not exposed at all corners I noted the levels of the points of the sloping face where the measures were taken, and compute the base length by knowing the angle of the face. The E. coat is 93 and 109 thick, and the W. 116 thick. The angle is  $80^{\circ} 37'$  on W.,  $82^{\circ} 0'$  on E.,  $84^{\circ} 34'$  in S. recess and  $88^{\circ} 18'$  at the back niche. The two false doors are both smoothly white-plastered without any decoration. In the southern door was a quantity of ox bones and large goats' skulls, placed there before the outer coat was built over it.

On the top of the mastaba, which is 195 high, are three pits. None of these were found in Mariette's digging, although the eastern side was much destroyed then, and a small tunnel made which went into the middle pit. The diggers could not understand it, and left the place. On crawling in I saw that my head was in a filled up shaft, and dug for it on the top. It

was difficult to find the top of the pit, as it was covered with a thick coat of brickwork. About 6 feet down the pit sides were clear, and it was found to be full of clean chips of the soft yellow rock through which the lower part is cut. It had evidently never been disturbed, and our hopes were high. After 30 feet of brick sides we went through 9 feet of rock, and found a short passage leading into a chamber on the south side. But in neither chamber nor well was a trace of any body or buried object to be found, nothing but clean yellow rock chips. I carefully examined all the floor myself and saw that there was no further cutting.

We then tried to the N. of this, and found another well quite untouched. This was cleared down to the level of the top of the doorway on the south side, where objects were found. At this level a mat of rushes had been spread on loose rubbish thrown into the well. Upon this mat were laid 4 alabaster bowls all tied up in cloths (PL. XXIX, 15); a broken red dish (16) with 28 flint flakes in it tied up in a cloth, a bundle of 50 flint flakes tied up together, 22 more loose on the mat, and 7 at the mouth of the chamber, in all 107: also pieces of thin wood on edge, all quite rotted, with some of the flints between them; and a conical pot of rough hand make like XXXI, 15. Just at the mouth of the doorway was a block of Nile mud  $7 \times 9 \times 8$  inches with ribbed outside, ribbing about  $\frac{1}{4}$  inch wide; a red pottery pan broken (PL. XXIX, 16), three large shells (17) one containing some blue paint made of powdered Chessylite (carbonate of copper), and copper needles, 11 or more thin, and mostly broken, and 3 thicker ones (18, 19). I then went into the chamber and examined it, but not a trace of a body was to be found in either the chamber or the well, nor any objects beyond those lying on the mat at the level of the top of the doorway. The pit is 50 to 57 inches wide, passage 43 wide and high, and chamber 97 on S., 84 on N., 73 on W., roughly cut by a pick 1.6 wide, leaving rounded sides. The flints (20-26) have been carefully sorted by Mr. Spurrell, and rejoined as far as possible to shew their original order and mode of manufacture. They were all struck from only two or three blocks of flint, but were all mingled together before being divided into different lots in the burial; so that the lots as found have no significance. A similar flake to these was found in the debris which filled Rahotep's well, so probably a similar deposit lay there before being exploited.

On further trial a third well was found in the axis

of this mastaba, and this had been opened anciently. We cleared it to near the bottom, but were then foiled by coming on large irregular blocks of stone lying in it. They were too heavy to raise, too large to turn out of the way, and we dare not break them up for fear of shaking down the very rotten and dangerous sides of the well. So risky was it that I abandoned the place, seeing that it had been all disturbed and plundered.

30. We have seen how in these large mastabas the southern false door has a courtyard for offerings before it (see Nos. 6, 11, 16); but a different development took place also, the E. front of the mastaba being decorated by a row of small false doors, and at the south end of it a doorway leading into a chamber in which is a false door, as in Nos. 18, 22; or else a much larger false door at the south, as in No. 13. In all the tombs on the plans, a thick black outline indicates the foundation of a brick wall which is now destroyed.

No. 22 has three small false doors (see PL. VII), which were painted, and next to these a chamber with a false door, also painted; the E. side was made into a gallery by a wall in front of it, and the S. end of this gallery was walled off, across from the chamber door. This walled part retained fresco painting in a fairly intelligible state, and I made a coloured copy of it which is here reproduced (XXVIII 5, 6, 7) and is described in chap. III. The closed room behind the chamber contained nothing; probably the *Ka* statues stood here, before the tomb was broken up. The well had been plundered, and a burial of the XXII (?) dynasty placed in it.

Mastaba 18 was evidently built later than many here. While No. 17 shews itself to be contemporary with the pyramid, by the whole mass being formed of clean stone chips, with occasional relics of the workmen, No. 18 is filled with whatever could be collected at a later date, much of it the small vases and saucers (XXX, 22 to 27) which were used for offerings in the IVth dynasty. Such a large quantity of these offerings would not be accumulated shortly, and as there is no heap of such by the pyramid otherwise it seems that this was built after the special popular worship of Seneferu was past, and no more were subsequently accumulated. At the pyramids of Gizeh and Dahshur there are similar heaps of these offerings. And they also occur often in private tombs at Medum, as Nos. 4, 6, 7, 11, &c. The number of wells in this mastaba is not original. The primary wells are only the 5th from the N., and perhaps one nearest to the back of

the chamber; all the others are secondary, and can be distinguished by being cut through the mastaba, and lined with brick, leaving a belt of hard ground full of chips shewing between the mastaba and the rock. The chamber has a walled up niche or doorway on each side, but it had been so much dug into blindly by Mariette's men that I could not settle it. On each wall are small decorative niches, on N.N.E., 1, on N.N.W. 3, on W.N.W. 3, on W.S.W. 4. These niches are only at 21 to 41 inches (1 to 2 cubits) from the floor. Most of the wells we cleared out; they had all been plundered, and contained a few burials in gaudy illiterate coffins of about the XXIInd dynasty. The strange enclosure S. of the mastaba is of unknown use. The ground plan of it is quite complete, with parallel walls, expanding into a sort of doorway at the south end. Of course I thought we had the entrance to some subterranean place; but all the north end was carefully cleared and examined, and solid rock found under a bed of concreted chips.

31. The third principal type of tomb here is the mastaba with a central well, and sloping passage like a pyramid, leading to the chamber. The above ground part of these tombs has all disappeared: and seeing how solidly the brick mastabas have stood, still 20 to 30 feet high, we cannot suppose that these others were all swept away by denudation down to the last course or so of brickwork. It seems as if they must have been intentionally removed, not for mere destruction as there are no remains about them, but rather for bricks; and this in a very systematic way, and not by mere chance builders. One is tempted to see in this the destructive hand of Ramessu II.; but whoever did it the mastabas seem to have been removed by contract, so that one was completely cleared, before another was touched. A section of one of these passage mastabas is given on PL. VII. The upper part of the well is brick-work. Then comes a breast-work on the south side, of large courses of stone. At the base a passage slopes down into the sepulchre, which has a recess for the embalmed viscera as in Rahotep's and Ranefer's tombs. The group of destroyed tombs W. of the pyramid (see PL. I) were probably all of this type, and only shew now as slight hollows in the desert. On trying to clear one of them a wide pit full of sand is found, which requires a long struggle to empty it. Two of these I examined, and others I tested enough to see that they needed a lengthy clearance. Those I saw were plundered, and one had re-interments in wooden coffins of the XXIV-XXVth dynasty without any-

thing but a few beads. The first tomb of this type which I opened was No. 15, and as the sand hole was very wide and deep, and the well destroyed, and I did not know the type, we had a very long affair with it. The chamber in this was not low and flat roofed, as in those W. of the pyramid, but was like the pyramid chamber, all over-lapping; and at the exposed end one could see of what immense sheets of stone these overlapping roofs consist. A high wind and falls of sand blocked it up before I had made a plan of it. The chamber contained nothing, and the recess in it had been forced out at the end in search of other chambers. From trials that we made and appearances it seems that Nos. 14, 11, 3, 2, and 1 were all mastabas of this type.

32. Having now described the three types of great mastabas we turn to the lesser tombs, which we will notice in order. No. 4 is a small mastaba much destroyed; but the panel over the north false door had fallen in early times, and was found buried; it shews a man named Heknen to have been interred here (PL. XVI). The work is but rough, though rather different in style to the usual, and we may see in the turned up nose a sign of the aboriginal race, as I have noticed elsewhere. In front of this are the remains of another mastaba which produced nothing.

No. 5 shews just the foundation of the wall, and in the pit we found the fragments of a fine alabaster disc table on a conical foot, and a diorite bowl; these have been rejoined nearly entire, and are now at Manchester. The tomb had been plundered in early times, the large slab placed in front of the entrance to the chamber being left in place and a hole made above it.

No. 7 is a small, well-finished mastaba with a wall along the front forming a passage, and a court in the middle of the wall. The false doors are however at the south end and in the middle. Part of the lintel of the south door was found, and is given in PL. XVI. It was of the most delicate sculpture, but unhappily was broken into small chips by the action of salt, so that not a single sign could be removed. A copy and a photograph were taken, from which it is here drawn. It shews much the same titles as Rahotep, but there seems to have been a priesthood of Sebek in the Lake; this, and the title "chief of the lake of the crocodile" on Nefermat's tomb, are the earliest mentions of the Fayum. The body of this mastaba is all of stone chips, very likely from the masonry of Rahotep's tomb. No trace of a well could be found, although we trenched three lines all the length of it,

down to solid rock. To the west of this is another mastaba of some height; but the tomb had been plundered and left open anciently, like the other tomb pits around here.

No. 10 is mostly denuded away; the pit is a very wide space filled with sand, which we did not clear. No. 11 is a small mastaba; pottery was found in the court of it. The large number of pits to the east of this were mostly separate, with a small brickwork top and sometimes a little niche in the east face of it. They are the poorest class of pit burial, and nearly all the interments were contracted. The chambers below were nearly all on the west side: a space usually about 60 inches long (37-66), 30 wide (28-38) and 28 high (26-30) was cut in the soft clayey rock, the body was placed in it, and the entrance filled by a rude flat wall of crude bricks plastered with mud, which often projected into the pit as much as its own thickness. The pit was filled with earth. In one case the surface brickwork had a slit in it to the N. of the niche, opening into a small *serdab*, in which little vases stood.

No. 12 is one side of a mastaba remaining, and two deep pits. No. 13 is a mastaba for general burials apparently, a sort of undertaker's speculation. The pits are very small, and in rows, as close together as may be. In the southernmost but one was a long wooden coffin, and a wooden head-rest with the body. Many of these common interments had been crushed by the fall of the rock roof or of the brick wall, and though I preserved every skeleton that was complete I could not obtain more than a dozen.

Passing to the Southern cemetery, PL. VI, the tombs 19, 20, 21 were greatly denuded, only just the foundations being left. The pits had all been plundered: those by 21 were peculiar, being long and narrow. No. 22 has been described already. The pit south of it had water over the entrance of the chamber. In one of these pits about 23 a loose stone sarcophagus was found, very rudely cut; 75 inches long, 24·3 wide, 19 deep inside; 7 to 8 inches thick, and 27 high outside: the head was to the north. No. 24 had water nearly to the roof of the chamber, and the floor could not be reached; the pit had never been opened before. To the S.W. of it was a small pit in the mastaba, built of brick, but not descending into the rock: in this was a large quantity of pottery, two dozen bowls being obtained, nearly all broken (see PL. XXX, 1 to 8); some of the bowls were wrapped in cloth, and some little clay models of jars (XXX, 7) were found. In No. 27 a similar deposit was found. There the northern pit was very shallow,

not 3 feet deep; but just to the S.W. of it was a smaller pit 30 × 32 inches, and 14 deep in the rock, with another deposit of bowls &c. (XXX, 9 to 13). And the southern pit, which is large and had been plundered, had a pit to the S.W. with bones in it. Thus it is evident that a custom existed of forming a small secondary pit into which the offerings were thrown; the bowls were probably wrapped in cloth to retain the food placed in them, and much dark brown organic matter was found saturating this pottery. This helps to explain the pit with bowls in the mastaba No. 8. No. 29 are two small wells with brickwork blocks over them, bearing a small niche on the east face.

33. We now turn to the burials in these tombs. Without giving the details of every skeleton found we may summarise them thus. Thirteen were fully recorded in a contracted posture, while only one burial besides Ranefer was found extended, setting aside those of later age, which were secondary burials. This long burial was in a wooden coffin; a wooden head rest with fluted stem lay by the head. Ranefer (see sect. 28) doubtless had valuable objects buried with him, as pieces of fine diorite and alabaster were found in the second well of that mastaba. On the other hand the contracted bodies very seldom have any accompanying objects, and they are never embalmed. Of the 13, 12 lay on the left side, with the head N., and the face E.; the knees were usually sharply bent, but the thighs were generally at right angles to the body; though sometimes bent up close, so that the knee was only 6 inches from the vertebra. The right arm was usually in front; but sometimes the hand was round the legs, sometimes up before the face. The left arm was generally under the body and legs, with the hand under the knees. The one burial in a different direction was with head W. face N. in a recess on the south of the well. But the motive of the placing in general was not to lay the body looking into the well, as in two other cases the chamber is to the south, but the face is turned to the east. This exceptional burial is also peculiar for having objects buried with it, a walking staff, and a head-rest; it was placed in a box, which is the case as often as not. Only two of the contracted bodies had objects with them; the one just named, and one with three small vases (like XXX, 22) by the head. That this contracted burial was not due to saving space, is seen by many tombs in which the body does not fill the chamber; and in one case the body is doubled up 43 inches long in a coffin 66 long, leaving over a third of the coffin

empty. And that the absence of objects with the bodies is not due to poverty is seen by the cost and care of the burials, in these tomb pits, which must have involved some weeks of work, and the frequent coffins of wood, which was always valuable; while even the rough little vases, which might be made in hundreds in one day, are only found in a single case. We are therefore led to believe that there was a distinct difference in beliefs between the people who buried at full length, usually mummified, with funereal furniture, and the people who buried in a contracted form, facing the east with the head north, and without any objects. Such contracted burials have been found at Gizeh, both by Rhind, and also in one case in large jars at the Mena Hotel. Such a difference points to a difference of race, and we see that the contracted posture is only found in very early times. As it died out, and was clearly the custom of the poorer inhabitants, it probably belonged to the aboriginal people before the invasion of dynastic Egyptians; and the extended burial, with its accompanying beliefs, is due to the upper race who founded Egyptian history. Rhind notices that the Nasamones buried in a seated posture (Hdtus. IV. 190); but this does not seem to be a contracted lying position, though it might easily be connected with it. Clothing remained on some of the skeletons, and it was always plain linen, more than a mere kilt or waist cloth, and with a twisted linen girdle in one case.

The coffins that were found, were mere square boxes; only the one with extended body and a head-rest had a framed lid, with large end blocks, and boards inserted in a curve in the end. To shew how far regular the boxes are I give the dimensions of one; outside length 45·6, 45·8; width 22·9, 23·1; inside length 42·8, 43·2; width 19·8, 19·9; depth 19·1. Another was 31·7 × 13·4 × 12·1. A baby was found in an oval basket.

34. A very curious question is raised by the mutilations of these bodies. It should be said that the skeletons lay exactly as placed; sometimes the head had just rolled over, but usually every bone was in its articulation. There was no trace of any rats or other animals having got access to the tombs to disturb the bodies. And the skeletons noted were not crushed, and were fairly clear of any fallen materials. In one instance the whole left leg was missing from the knee: the end of the thigh bone came close to the brick wall, and not a trace of knee cap, leg bones, or foot was present. The end of the bone did not shew any change in the joint surface, so the amputa-



tion must have been shortly before death. In another case the left hand appeared to have been cut off, the end of the arm bone was close to the front wall, without room for the hand, and the nearest wrist bones or others were four inches from it, and those appeared to belong to the right arm, while the left hand bones were under the elbow. The arm bones were not fallen or displaced: so the hand must have been severed in life. In another case, where the arms were both raised, and the hands placed together in front of the face, a wrist bone was found under the leg four inches below the knee, which was quite undisturbed. And in the same body a toe bone was found under the pelvis. This is difficult to account for by any ordinary supposition. Another strange case was where three teeth were found by the pelvis, though I had lifted the skull as carefully as possible, as I always did, to avoid any chance of teeth dropping out. So both from the care in moving, from the skull not being lifted over the pelvis, and from the teeth not being on the top, we must suppose them to have been extracted before burial: possibly they had been swallowed. Four such curious displacements of bones in only 13 skeletons shews that much care must be spent in fixing the positions when such are found in future, in order to clear up the questions involved. All of these skeletons are now being prepared at the Royal College of Surgeons, and will there be studied, with reference to race, and also for the various diseases of the bones which are found in them.

### CHAPTER III.

#### THE SCULPTURED CHAMBERS.

35. The plates IX to XXVII have all been executed by producing full-sized drawings, and from those reducing the present copies by photo-lithography. No doubt it would have been better on the one hand to have reproduced them here on a larger scale, in a few cases the details are too minute or the lines too fine, and a magnifier may be used with advantage to most of these plates; on the other hand a smaller scale would have enabled a more connected view of the scheme of decoration. The advantages obtained here however seem to be the greatest. No wall is divided on to two plates, excepting in the case of the long lintels which spread across the whole length of a tomb facade; these are separated from the rest of the facade, and each divided in two parts. Moreover in

all cases the scale is the same throughout, so that the character of different parts can be compared. And the reduction of a foot to one inch enables the whole height of a tomb to appear on one plate.

In the details the greatest accuracy has been aimed at. The individual expression of every face among the farm servants, and other small figures and hieroglyphs, has been observed; the exact shape of the head in all of these, the form of the hands, the relative lengths of the fingers, the number of lines and notches in a wig, and such points, were all attended to individually, and not merely done on a general system. In the forms of the hieroglyphs the same detail has been followed. For instance not only the number of waves in *n*, but also the slope and thickness, have been copied. If a sign is askew, misshapen, or tilted, it has been strictly so drawn. Nothing has been assumed or restored, except in a few cases of a notched or injured line. But although all injuries which destroy the outlines are observed, the forms have been traced as far as possible, and credited with completion wherever the original form was not irretrievably lost. Hence these copies look more complete than are the actual walls. In the many sad instances of disfigurement since Mariette's copies were made (which comprise about  $5\frac{1}{2}$  plates out of the 19 here), it might at first seem pedantic not to fill in the parts now lost where those copies shew them. But it will soon be seen on comparing those former copies with the present, that no scientific value can be allowed to their details. The frequent misplacement of signs, omissions, and additions, even extending to inserting a figure and action which does not exist (see top of PL. XXIII), and the inattention to the real forms of the figures and signs, would make any additions drawn from such a source a serious detriment to these present copies; to say nothing of the doubt as to the very existence of the missing signs. Insertions of dubious character would throw a suspicion over the whole accuracy. To those students who may need the fullest materials a reference to Mariette's plates is not a weighty business; while those who wish to place as much confidence as may be put in human work, can rely on these copies as being equivalent to the original sculptures, for all purposes of study that we can at present contemplate. No doubt but some inaccuracies may have crept in. They will probably be found in slight irregularities of the relative position of parts, due to copying on separate sheets; and possibly a sign might have been omitted, certainly none have been added.



36. The method of work was as follows. Sheets of thin paper, 3 feet high, 1 foot wide, were used. Beginning in a top corner, a sheet was held up by the left hand, and every line of sculpture was outlined by the right hand, a dry squeeze being thus taken. The soft part of the fingers was used or else the nails, according to the form. Then the squeezed sheet was laid on a drawing board, held just below the sculpture, and the outline was pencilled in, following the squeeze, but looking at the stone for all fine details and indistinct points. Thus the accuracy of a cast, and the interpretation of an eye-copy were combined. A minute pencil cross on the stone, at the corners of the paper, insured keeping a correct register of the positions of the sheets. Afterwards—in England—the sheets were joined into large rolls; the outlines were all inked in of a suitable thickness, equivalent to  $\frac{1}{400}$  of an inch on the reduced scale; and photolithography did the rest of the business. For the coloured parts proof copies were coloured, and served for the chromo-lithographer to work by. The tints of the colours of each figure had been carefully copied on a key sheet on the spot; and samples of the inlaid colours of Nefermat's tomb, which had fallen out, and were found in the dust, served to give their tints. From much of the surface the colours had entirely vanished; in Rahotep's tomb they had been washed away by wet squeezes being taken in a barbarous way. In such parts the ground tint is made continuous over the figures. Wherever a trace could be found it is noted, but where a wide expanse of colour is without detail, as in faces without eyes, it means that the lesser parts have perished, leaving only a ground-work. In the case of wigs which shew details, they are left in outlines; but in all cases the hair is black. So far as the colours remain enough to give a general combined effect, they are here reproduced; but it did not seem worth the printing to give only a few scattered touches in those plates where the colour had nearly all perished. I have dwelt the more on the details of these copies as I much hope that published copies of all fine work will be made in future on some such system. The very crude method of irregular and inexact hand-drawing, which has been hitherto usual—or even worse, the adopting the style of some period of Egyptian art, on stone or papyrus, and drawing everything in that manner—is responsible for the neglect of Egyptian epigraphy, and artistic detail of styles, and schools, and periods, which is so lamentable. No doubt this exact copying takes time. Altogether these plates have occupied

me about four days each, beside the lithographer's work. But such time is well spent, if it opens out a new study of art and history.

37. We will now turn to the separate plates and give some account of them; while the inscriptions will be treated by Mr. Griffith in chap. VI.

PL. IX. The lintel over Rahotep's facade is divided here into two parts, on the upper half of PLS. IX and X. It is less finely carved than the interior, and in very low relief; the separate panels of it are sunk so as to obtain the depth required for the signs. No traces of colour remain upon it. The wall of the tomb front below it is quite plain. The last block of the lintel has been removed in late years; and Mariette's copy shews the remainder of the inscription to have been nearly the same as on the "south side of the recess," PL. XII, ending with the name of Rahotep. The wider panel, first on PL. IX, is over the doorway. The south side of the passage is all in relief, as is the rest of this tomb; it has been defaced near the door, by cutting away the surface to allow of fitting in the closing blocks. We here see Rahotep and Nefert standing watching the chase in the desert, while below—in the lower lands—is the ox led forward, and indicated by three tethers or hobbles formed of a loop of rope passing through two holes in a piece of wood. It seems to be used here as a determination for the place for tame animals, in contrast to the wild ones above.

PL. X. Here, on the opposite side of the passage, Rahotep and Nefert behold their sons snaring birds; and below the fishers coming to shore with the ropes. The titles above contain some of the most important forms of signs; the column *an*, and the columns supporting a roof, with a central pillar *aa*, in the sign *heb*.

PL. XI. This comprises the whole of the wall, through which one enters the chamber; and the inscription on the drum over the door is here turned round to appear in the doorway. Rahotep is standing beholding the boat building: this part is in excellent condition, excepting a large flake which has come off, carrying the head and arm of a carpenter. Below Rahotep are scenes of servants, a cattle-herd, two slaughterers, and bearers of offerings of wine and of sweet palm beer. On the other side are the fishers drawing the net, which has floats above and sinkers below it. The calf-herd and fowler, and six farm servants, fill the lower scenes.

PL. XII. This comprises the south end of the chamber, and the west wall to the south of the recess at the back. The fish-curer seated under the shade of the lotus plants, splitting his fish with a knife, and

spreading them out to dry, fills the upper scene. The leaves of the plants are only painted, and not carved. Then the two boatmen who have caught a monstrous fish, which they carry in triumph on an oar between them. The ploughing and 6 farm servants occur below. On the other wall is Rahotep standing in priestly dress with a leopard's skin, as he held more than one high priestly office in the country. The small inscription is from the stelas in front of the tomb; both are alike. It is rather roughly carved compared with the interior work. This is what Mariette ascribes to a separate mastaba which he attributes to a fictitious Ranefer.

38. PL. XIII. The lintel or architrave over the whole west side of the chamber comes at the top. Below this is the recess with its two sides; but as these sides are at right angles to the plane of the lintel and wall, they do not of course appear beneath the lintel actually in this way. The walls really beneath the lintel on each side bear the two large figures of Rahotep on PLS. XII, XIV. The need of keeping the recess all together obliges this separation. The lintel is finely painted, and furnishes some of the best signs selected for the frontispiece. The left wall is covered with lists of offerings many specified as being of the very best, *tep ha*, or A 1. The manner in which the jars are all shewn, with lids fastened down by a cloth band, and bound with string, and sealed, is curiously detailed. In the centre is Rahotep seated, with the usual table before him. The arrangement of the list of offerings is just like that in the earliest tombs of Abusir and Gizeh. Below this is the niche, with the children of Rahotep at the sides; T'etta (or Zedda), Atu, Nezem-ab, Setet, Merert, and Neferkhu. The damaged part in the centre is given entire by Mariette, the lost signs being *tu* (legs) *u. f.* On the right hand wall are further lists of offerings of the same character.

PL. XIV. Rahotep appears with a slight moustache, as on his statue in Gizeh Museum. On the north wall are wild cattle with their attendants; one of the farm names has been inserted in the lowest of these scenes, and it occurs again in Nefert's tomb on the next plate. The six servants bearing offerings below, of clothing, meat, and drink, fill up the wall. At the side of this plate are given the lower parts of some figures, which are all that remain of the sculptures of Ranefer's tomb, on the sides and back of the recess. The work of this tomb is markedly inferior to that of Rahotep.

39. PL. XV. The tomb niche of Nefert, in the same mastaba as Rahotep's, has a lintel over it, of which the

small fragments left shew exactly the same arrangement of titles as on the outer lintel of Rahotep, PLS. IX, X: hence this was not copied. The outer wall below it is blank. On PL. XV is shewn the sides and back of the recess. The lists of offerings occupy the upper part of the sides; and the list of farms the lower part. Of these 12 occur in Rahotep's lists, two here are not in Rahotep's, and one in Rahotep's is not here. They all differ from the farms of Nefermat, so it is certain that these were different families. Much remains to be done in forming property lists of farms, thus tracing the descent of property, and proving genealogical connections by this means. From having this repetition of the names, we can judge whether the matter of the figures being male or female has any significance. We find that of the dozen which recur, four are always male, six are always female, and only two vary, being male in Rahotep's and female in Nefert's. This regularity shews that some intentional distinction, probably in the gender of the name of the farm, is intended. The tombs were not copied one from the other; the spelling of the names varies somewhat, and the order is altogether different throughout; hence the distinction in the figures would not have been maintained if they were purely arbitrary and ornamental in their character.

In the middle are Rahotep and Nefert seated, on the panel; and below that the children occur on either side of the niche, as in Rahotep's. The order varies, so we cannot distinguish their ages, and there is no difference shewn in the ages of the boys, so that the sculpturing of the two tombs must have been nearly contemporary. The distinctions of age shewn in tombs are (1) unclad, pointing to mouth; (2) unclad but occupied; (3) clad with kilt, hands empty; (4) clad, holding sceptre; (5) clad, holding sceptre and long staff; all these may be seen in Nefermat's and Atet's tombs.

40. The decoration of Nefermat's tomb differs entirely from that of Rahotep. The characters and figures of the whole of this tomb, and of Atet's, are incised in the stone, and filled up with coloured pastes, level with the surface; except a few figures down the edge of Nefermat's chamber entrance, which are in relief. This system of colouring was a special device of Nefermat's own, doubtless occasioned by his observing the flaking and washing of colour from painted sculpture. He particularly states (on PL. XXIV) that "He made this to his gods in his unspoilable writing." The sculpture is all hollowed out, with the edges undercut, so that the coloured pastes

with which it is filled should key in. Over wide surfaces special means were adopted. The area was divided into a number of deeper cells in the bottom, divided by cross ridges, of about a third of the height of the whole hollow. Holes were then drilled diagonally beneath these ridges, so as to meet and form bent tunnels for complete loops of the paste to hold in. The details of figures, such as the wig and face, were often cut to different depths, partly to hold the material better, partly as a guide to the artist in paste, to shew where his internal outlines were to come. Very narrow lines are simply graved out in a V or U form, and filled up. Details of different colour, such as features, or feathering on a bird, are made by cutting outlines in the base paste, and filling them up with a different colour. A base of cheaper colour was often used, and a facing of more valuable paste was incorporated with it. The invention was not a success; extremely tedious, it yet yielded to injury more readily than the painted reliefs. The coloured pastes were very easily picked out and destroyed, and the action of the ever-present salt of Egypt has reduced much of what remains to a mere loose powder, and forced it out of the hollows in the stone, as a rotten mass of dust that will hardly bear touching. Much has been ruined since Mariette uncovered these tombs, and left them to destruction at the hands of every careless Arab and wanton tourist. The colours employed, and the means of fixing them, have been most carefully examined, chemically and microscopically, by Mr. Spurrell; and I have the pleasure of embodying his results in the end of this chapter.

41. PL. XVI. The architrave of Nefermat's tomb is broken in the middle, where it is here divided on the plate; and the right hand end was altogether lost in ages past, while all that remains is deeply weathered by exposure. The titles can be traced out by the list on PL. XX. The portion of a stela, on the left hand, is in relief, and of fine work. It was found lying just in front of the chamber, almost on the ground. Scattered near it were many chips of fine work in relief; these I brought away, as illustrating the use of scraping tools for dressing surfaces. What all these chips and the stela belonged to, and what construction has been here destroyed, we cannot be certain. But as the edges of the chamber door are in relief, it seems not unlikely that the stone blocking of the doorway (of which the traces are seen by the cutting on the walls) had a relief sculpture on it of a false door and panel; and thence, after the destruction of that, came these fragments.

The other pieces on the same plate are miscellaneous. The stela or panel of Heknen was found at the north false door of mastaba No. 4. It is of rough, irregular work, of a primitive style. Now in the Ashmolean Museum, Oxford. The portion of a lintel from mastaba 7, is drawn from a photograph and hand copy. It was so completely shattered by salt that not even a corner of a sign could be moved and kept whole. The titles are much the same as those of Rahotep, and it was perhaps belonging to a son of his, who inherited those offices.

PL. XVII. The south side of the facade of Nefermat is well preserved at the base, as that part was below the evaporating level, and so kept constantly moist; hence the salt has not accumulated in it; and happily Mariette's men did not take the trouble to clear it. The huntsmen carry long bent sticks, or flaps of hippopotamus hide. Two of the sons appear as boys leading tame apes. Below that the leopard is finely drawn with the prowling action; from the position it seems as if he were a hunting animal, and not wild. At the base is a dog hunting jackals. On the jamb of the chamber front is Nefermat, with Atet behind him. Below them are two sons who recur on the back of the chamber (XX) and elsewhere, and four children who do not recur; from *sen* occurring added to two names it may be that they are brothers' children; if not, they may be grandchildren, sons of the sons above them.

PL. XVIII. Here Nefermat stands with a son before him; and Atet is below with three sons. Her robe is of leopard skin, the spots of which are partly in a pattern (each spot is strictly copied); and on the wrists and ankles are bead decorations, shewing how coloured beads were then utilized. The son Khent's title "chief of the lake of the crocodile" is very interesting, as the earliest mention of the Fayum. On the rest of the facade is, at the top, a slaughtering scene; below that, a very curious compound group, a huntsman, a large branching tree, up which a monkey is climbing, and from which a goat is hung being cut up, while a man near stirs the fire by which it is to be cooked. It is very unfortunate that this is so much injured, the surface in parts having been scaled entirely away by the salt. A much scaled group of fishermen comes below; next is only the lower edge of a very curious scene of cattle, among some strange plants, which are inexplicable in form and colouring. A group of bird-snaring, and a pair of ploughmen come below. All the lower part is in excellent state, free from

salt, and never exposed until I uncovered it; I soon reburied it.

PL. XIX. This comprises the side of the chamber on the left hand when facing it; the slope down the left of the plate being the sloping front of the facade. As much has been totally effaced here, owing to the insertion of the blocks for closing the chamber, I have brought together the parts of the remaining sculpture, in order to include them in one plate. The top left-hand piece should be about two inches further out to the left, and the lower piece about three inches out on the plate; all the intervening space being blank. The outer figures are all of farm servants, and are in relief, as I have mentioned. Inside Nefermat is standing, beholding the offerings for his tomb; while his sister or daughter Nub, seated on the ground by his side, puts her arm round his leg. The details are all lost, owing to the falling out of the inlaid colouring, but this is the best female head that remains to us in this tomb. Below are two lines of farm servants with the names of the farms. Among these is Methun, which has been considered to be the ancient form of Medum.

PL. XX. This shews the back of the chamber; the lower part of which is all destroyed, except the left hand figure, which is here put at the side.\* The arrangement of the list of offerings is the same as in Rahotep's, and the early tombs at Abusir, &c. The granaries in the bottom line but one should be noticed. In the niche below the panel is Nefermat; Atet, his wife, faces him, and five sons can be recognised by their names.

PL. XXI. This is the side of the chamber opposite to PL. XIX. The wall has been similarly disfigured, and the remaining portion of the front part is here brought closer in to the rest. At the top there is a trace of a cartouche of Seneferu in a farm name, as there is on PL. XIX. These mentions of Seneferu are the only cartouches found in any tomb at Medum. Here Nefermat is being borne in a chair of state by six supporters, the front figures of whom have been cut away. Below are two lines of farm servants.

42. PL. XXII. We now pass to the chamber of Atet, in the same mastaba with that of Nefermat. The lintel appears to have been complete in Mariette's time, but it was left exposed then, and before 1882 it was miserably shattered. It is useful therefore to refer to his publication for a fuller view, although not

\* The curious projection on the shoulders of Nefermat is not part of the chair, but is some fitting of the leopard's skin priestly dress, as it is always accompanied by that, either seated or standing.

a single point of detail that can be now checked, is accurate in that copy. The scene is of Nefermat closing a clap net, of which only just the top now remains; while his three sons carry birds that have been caught to their mother Atet, who is seated at the opposite end. Below this come the top scenes of the facade, the rest of which appear on PLS. XVII, XVIII. The slaughterer on the left is holding the leg of the ox up, while the head is turned round backward on the ground. The portion of the title *ta sab t'a*, is on a fragment which I found below in excavating, and is here inserted in its place, as I have done with some other pieces found loose. These fragments I of course buried again, putting them at the extreme back of the tomb floor in a heap, with the small fragments behind the larger. The name on the drum is Atet, and not Teta as in Mariette's copy; and it is as well to say that his reading of Nefermat as Nefertma is contradicted both by the sense and by the inscriptions.

PL. XXIII. Down the side of the facade is a series of scenes, cattle at the top, then boat-building, and six children at the base. On the edge of the great monolith of the chamber side, is a figure of Nefermat, in priestly robe, and five children below.

PL. XXIV. This is the opposite side of the facade. The edge of the chamber side forms a slight pilaster, on which is Nefermat standing, and saying that "he made this to his gods in his writing unspoilable." Below him is Atet seated, with two sons behind and four below her. On the rest of the facade is a series of scenes. At the top are servants bearing wine and fruit, *deb* being figs or perhaps pomegranates from the form. Beneath are the tame birds, with the determinative of three tethers; and two tame animals below. This means therefore again the "place of domesticated animals of the tomb" as in PL. IX. The next line shews the "coming out from the marsh," the fowling in a boat, with the stick, and loop of withy on which the birds are strung, like the object held by the seated figure *sz*. Next come two of the younger sons, in marsh dress, catching birds in a net. And at the bottom a very small boy looking after an ape—who seems to have the better of him—and a monkey in front who cannot resist pulling the bird's tail: the bird's hinder leg is suspiciously raised; as if he was just going to let fly with it right into the monkey's face.

PL. XXV. This is the left side of the chamber when facing into it. The wall is grievously scaled by salt, and not half of the sculpture remains.

Nefermat is here standing viewing the boat building ; and a fragment remaining at the bottom of the wall shews a wine-press in use.

PL. XXVI. The back of the chamber is much destroyed, and the figure of Atet seated before a table of offerings (which is shewn by Mariette on the panel) is now wholly smashed away. Nefermat and Atet appear below that, with several sons.

PL. XXVII. This wall has suffered much in every way. The middle has been much scaled, by salt flaking the stone, while most of the upper part has been broken off in a huge flake, and lesser pieces, by the Arabs since it has been left uncovered. Owing to this shattered state it was difficult to piece it together in the drawing, as the great flake was too large to set up in place. Hence there is some little distortion in this sheet. Nefermat stands with his sister or daughter Nub behind him ; for an edge of the sign *nub* remains. He is holding in two hunting dogs by cords, while they are seizing a hare by the neck and a gazelle by the leg. This scene appears to have been designed on a larger surface, and then cut down at the outer edge ; in the middle line there are the horns of some animal which is not on the stone ; in the top line the hind part of the hare is not included ; in the lower line the animal's head is partly off. Perhaps the design was done before the sloping edge was cut, with the intention of a different form of front. The lower part is occupied with tame animals.

43. PL. XXVIII. The group of geese from Medum, now in the Ghizeh Museum, is justly celebrated. It was found by Mariette's workmen in clearing the tomb of Atet, and was removed by Vassali. When I came to clear out these tombs again, I found in the open passages of Atet and Nefermat various melancholy fragments of what had been fairly perfect paintings twenty years ago. The heads had been chopped out with a pick, and the morsels shewed how barbarously the nineteenth century had treated what had remained to us from the beginnings of history. So ruined were these fragments that only one of them is worth reproducing, No. 2, PL. XXVIII, representing two fowls, one drawing the net rope, the other carrying a bird. Some other lesser chips I placed in a recess in the brickwork of Atet's tomb, before I earthed that over. Beside what had been destroyed, I found some portions which had happily escaped the terrible attentions of the previous excavators. In the narrow court in front of Nefermat's facade the ground had not been disturbed at the bottom, since the natural decay of the building. There lay the remains

of the blocking of the chamber, carved in relief with a panel, which is in plate XVI. There were also other chips of that work, which I carefully collected, to examine the mode of stone dressing, as they were quite fresh and sharp. Evidently a metal chisel or adze, and a metal scraper were used ; for the scratch lines all being sunk, were made by jagged projections of metal. Whereas in Ranefer's stone-work a flint tool was used for scraping (as at Lachish), all the scratch lines being raised, owing to chipping out of the flint edge. The source of this difference is proved easily by experiment. I also found a long length of painted fresco (XXVIII, 1) which had covered part of the mud-brick facade above the stone facade. It had, in course of time, slipped off bodily from the wall, and fallen into the court. Of course it was much shattered, but yet it was fairly continuous. By great care I removed the pieces, but the mud plaster backing was so much rotted (by rains running down into this hollow), that it broke up a good deal in travelling. I therefore removed all the mud back, and transferred the film of painted gesso to slate backing, on which it is now quite safe : this occupied about a week in England. It affords us some details of colouring not otherwise known. The seated figure *sa* is in a banded black and green costume ; and the *ta* sign is curious and inexplicable, and differs from the later forms. This remaining piece opens our eyes to what was the great extent of fresco work in this earliest time. From the arrangement of it, it appears that there was a colossal figure of Nefermat, standing or seated, with his titles and name above his head. He was "Beholding his prosperity," typified by servants leading in oxen, &c., before him. Judging by the relative size of such inscriptions to the figures in PLS. XVII to XXI, this must have been by the average 84 inches high if standing, or 59 if seated ; the latter is more likely, according to the length of the inscription. This, with the inscription over him, would require a fresco wall about 80 inches high. The facade below it was about 180 inches high (including a blank space below the sculpture) ; so that the total required for the court is 280 inches. As the mastaba was probably 412 high, this is quite possible. In the base of this court we found pieces of wooden logs, &c., belonging to the roofing, that had fallen down into the space. It is indeed fortunate that the former excavators did not persevere, and so clear out the whole place, and destroy this evidence twenty years ago.

Another fresco that I found was in a part of the

passage to Atet's chamber. All of this had been finely painted, as Mariette describes, "orné de scènes variées, de chasse et de pêche, peintes avec une grande finesse sur le stuc"; when I cleared it not one piece of all this was left, except behind some of the brick-filling of the passage which the ravagers had not thought worth removing. I there secured the pieces XXVIII, 3, 4. Nos. 2 and 3 are in the South Kensington Museum; No. 4 at Owens College Museum, Manchester. In the passage to Nefermat's chamber I only found remaining a part of Atet in a leopard-skin dress, and the legs of Nefermat. These I left on the wall.

Another example of wall fresco of inferior style, but interesting in detail, I found in the end of the passage of mastaba 22 (see PLS. VI, VII, XXVIII, 5, 6, 7). The master was named Nefer...uu and had the title *Kher heb*. His son, who appears before him in No. 6, had the title *sar*, ruler of the mansion, and companion, but his name is lost. The scene on the west wall No. 5 is the master standing (not copied, as much defaced), before whom are led two pairs of oxen, who have housings, or supports for a litter, upon them. Before the man is the title "overseer of the *Kha*," perhaps a thousand oxen. On the east wall, No. 6, is the master, with three sons, watching the farming scenes, of which two harvesters remain. The white panniers, which they carry on their hips, are to hold the ears as they cut them off. Although no sickle is represented it is seen that only the left hand grasps the straws together, shewing that some implement must be held in the right to cut them. The grain is long-bearded wheat. On the south wall (No. 7) is a fowling and fishing scene. The plants are interesting, as not of the conventional forms; and the fishers, though roughly done, are spirited, the truth of the four men dragging up the net from the water is better than stiff drawings of later times. The remains of two fishes below show what care was given to detail. The sinkers and floats to the net are the same as in Rahotep's tomb. Poor as this tomb is, the paintings are as good as most of those in the great sepulchres of the XIIth dynasty.

44. I have been favoured by Mr. Spurrell with the following results of his careful examination, chemical and microscopic, of the colours employed in the Medum tombs, to which I add my own observations on the local details at Medum.

The coat of colours on the stone sculptures of Rahotep's tomb and Nefermat's doorway has been laid on with a brush, and in some instances apparently

rubbed into the stone so thoroughly as to become adherent. The painting of the coloured frescoes, from the passages of Nefermat's and Atet's tombs, is also brush work, and was apparently mixed with a medium which has decayed and left them sometimes pulverulent. In the yellow ochre—on a deer—it appears that something was employed much like albumen in its resistance to water, but the film is too thin to experiment on. These fresco colours are laid on a fine thin layer of gesso, bright and pure, about  $\frac{1}{10}$ th of an inch thick. The outlines are first traced in faint red, and the final colouring laid over them. The gesso is laid on a coat of lime and gypsum burnt together, and mixed with *tibn* (chopped straw), about  $\frac{1}{3}$  to  $\frac{1}{2}$  inch thick; and this rests on a coat of mud and *tibn* about  $1\frac{1}{2}$  inches thick, which was applied to the bare brick wall, and held up by keying into the joints.

*White* is a pulverulent efflorescence of gypsum—calcium sulphate—very bright if selected, but creamy in general.

*Black* is lamp black, and no charcoal or graphite is found. A circular cake of lamp black  $\frac{1}{2}$  inch high and  $1\frac{1}{2}$  across, slightly concave on top, was found loose in Rahotep's well.

*Yellow* is yellow ochre with clay, in the best examples it is nearly pure ferric sesquioxide. Much variation in tint was obtained, both by thickness of the film and difference in the earth. Occasionally a faint wash of red hæmatite over the yellow changes the hue to orange. A yellow marl abounds at Medum; it might be used as a pigment alone, but in no case has it been so found. After the removal of the calcium carbonate from it by rain, the fine ochre which would be washed into pockets and seams would give a good colour. Steeped in sour wine the marl gives a superior pigment, identical in colour with most of the yellows. It is noticeable that this deepened colour is not lightened with calcium carbonate, but with sulphate (gypsum), when required by the artist. A greenish grey on the deer (XXVIII, 3) was made by a yellowish earth containing fine brown grains (sand) of some mineral.

*Red* is red hæmatite ground in water. Coarser and darker reds are from natural deposits of ochreous clays, some of which appear to contain much manganese.

*Brown* is frequently obtained by a thin wash of hæmatite red over impure black, as for birds' feathers. But it is usually an ochre unburnt, and sometimes laid over a coat of hæmatite.

*Green* is malachite, and being pure it is remarkably uniform in tint. No traces of green or blue frits have been found in all this early work.

*Grey*, and neutral backgrounds, often greenish, are made of pale yellowish earth with a little lamp-black, which burns out at a red heat.

*Blue* is a rarer pigment, and none was found loose for removal, nor on the frescoes brought over. On the walls it appears much of a blue verditer tint, apparently derived from an impure earthy blue carbonate of copper. The shell (XXIX, 17) bore, smeared on the inside, some intensely blue chessylite, very finely ground, and without the minutest trace of malachite. The animal matter of the shell, and the medium of the paint has perished.

45. The colours of Nefermat's and Atet's inlayed work are wholly different in tone, all mixed with more or less white. Their mode of application I have already stated in section 40. These pastes char a little, shewing organic matter, which disappears on burning. No extract by water or alkali could be obtained, nor any smell like albumen or gelatine when burnt. Though some pieces retain their original hardness and polish, most of them are powdery, owing to decay of the medium, and action of salt. This hardness and darkening extends a variable distance into the paste from its face. It is apparently due to rubbing in an oil or liquid turpentine, by which the surface was polished and the colour enhanced. Occasionally the saturated part is not thicker than a visiting card, and by drying has contracted and separated from the mass, which is then seen to be full of bubbles.

There are throughout most specimens many small oval or globular bodies, mainly at the surface. These globules can easily be extracted as they sink in water from the intermixed colour. They are brownish yellow, translucent, easily crushed, and soluble in alcohol: burning brightly with a resinous smell, and moderate smoke. They may be due to grains of resin mingled with the paste before application, or to a collection of the turpentinous polish into the air-bubble spaces of the paste; or—less likely—a segregation of the turpentine originally mixed with the paste. Turpentine may have been liquefied with strong wine.

The colours are,

*White*, burnt gypsum, more or less creamy.

*Black*, or rather always grey, of lamp black and burnt gypsum.

*Red*, in various shades lighter than hæmatite, is

an ochreous clay mixed with fibrous gypsum pounded. In one case the red is mixed very intimately with yellow ochreous clay. The painted lines of red are rubbed hæmatite.

*Red brown* is the same as olive yellow that is burnt, and it does not alter by further burning.

*Yellow*. (1) Clear, low tone, yellow; of ochreous clay mixed with powdered gypsum. (2) Olive yellow; ochreous clay or earth. (3) The same, darker, with brownish stains. None of these contain carbonate of lime.

*Green* is pure malachite, lightened in some cases by pure gypsum. It is often economised by filling below with yellow, and facing that with the coat of green. This accounts for certain signs which are usually green appearing as yellow in these plates.

## CHAPTER IV.

### EARLY HIEROGLYPHS.

46. A branch of Egyptology which has been remarkably neglected hitherto is epigraphy. In the limited and arbitrary alphabets of Phœnicia, Greece, and other lands we know that epigraphy is one of the most carefully and scientifically treated subjects. But in Egypt epigraphy should be not merely a study of arbitrary signs, but also of the greatest interest as throwing a light on the civilization; and yet it has scarcely been thought of beyond the mere matter of classifying the signs by their nature. Some variations of forms in different ages are generally recognised, but the question of the earliest forms known has hardly been touched; yet this matter is what explains to us more of the condition of the earliest historic Egyptians than any actual objects that have been found. I propose here to state the illustrative details of the signs that occur at Medum, and also a few which I have noted in the Ghizeh Museum.

47. Following the usual order of classifying signs, we first note the squatting figure holding a long stick on which is a loop; the colour is best seen on the fresco (PL. XXVIII), but there is a curious variation in three lines radiating from the loop (PL. XXII); this seems to be the *sa* sign, and when we see the fowler with such a loop of withy, on which they strung their birds (PL. XXIV) and so carried them by a stick, it seems as if the source of the sign was before us. The Libyan archer appears here (IX) as distinct and characteristic as in any later time.



One rare sign appears, a man pounding in a mortar (XV); and in the old man sign (*aa* XIII, XIV) the stick is forked below; the other human signs (*ur*, *ked*—build—*shep's*, *s* infant, and *menat* nurse determinative) are all as known in general.

Among parts of the body is the nose, which is sometimes alone (XXIV), and sometimes with the eye (XXII). The heart is well shewn (XIII), and is clearly not a vase as it has been classified. It is noticeable that the markings on it, which are constant until late times, are exactly the same as those on the *nefer*; it rather appears that the *nefer* is really the heart and tracheæ, as Mr. Spurrell has suggested to me, and since no trace of strings is ever shewn upon it, nor is the stem prolonged over the round part as in drawings of guitars, we must feel much doubt as to the usual explanation of it. The colour of the parts of the body is not constant; the mouth is mostly yellow but sometimes red, the arm red, the hand yellow, the legs both red and yellow. As red is the male colour and yellow the female these colours are suitable, but are hardly likely to refer to a difference of gender.

Among the animals the hog (XXI) is of rare occurrence, and looks here as if it were wild. The lion's head, *peh* (XIII, XIX), is clearly not a drawing from the animal, but of some object formed like a lion's head, perhaps a draughtman on the top of a staff.

The bird *ur* is unmistakably the wagtail, which is so common in Egypt; the general colouring (Front. and XIII) and the black spot on the breast leave no doubt on the subject. The eagle *a* is very well shewn in coloured examples (Front. and XIII, XIV); and also the owl (Front. XI, XII) which is very true to nature.

The oxyrhynchus occurs here (XIII), which is rare. Of reptiles there is the crocodile, all yellow (XXIII), or yellow with black feet (XVIII), which appears in the interesting title "chief of the lake of the crocodile," the earliest name of the Fayum. The frog also occurs (XVII) yellow. A part of an animal which has been very uncertainly attributed is here well shewn; *Kha* is certainly not a club, nor a part of the human body: the structure shews the mouths of glands (XII, XIII) and can only be referred to the mammæ of some animal. The sign *shed*, which has been classed as a whip, and described as a skin bottle, is here seen (Front. and XI) to be the skin of an animal, yellow, or mottled black or white, flayed off, and rolled up raw, with the fur outside; the red flaps of the inside of the legs and neck skin shew out at the ends, and the roll is tied around the middle,

and each end, with a cord. The senses of *shed* (a skin bottle, to pull off, flay, lift up, save, or select) exactly agree with this.

Among plants there are some varieties of tree forms which might be discriminated (XII, XIII, XV, XVII, XVIII, XXIII); and a variety of the *hen* plant (XV), which is clearly a low shrub, and suggests a connection with the Arabic henna. The pod *net'em* (XI, XIII) which is usually called the acacia is hardly of that form; and, from its meaning "sweet," it is more likely to be the sweet pod of the Kharub or locust tree. Coming next to inanimate objects we notice the colouring of the hill sign *du* (XXVIII), which is light red sprinkled with spots of black, white, red, and green, representing the many-coloured pebbles which catch the eye in walking over the desert. In one case there is a strip of green below it for the edge of the green land at the desert foot (XIV).

A sign which has been most absurdly classed as a framework, is the road, *ua* or *her* (IX); this is finely coloured on a slab in the Ghizeh Museum, and explains itself as a red road or embankment, with a blue canal on either side, and green trees growing along the canals in alternation.

It is noticeable that water is always blue, green, or black; the wavy line *n* is black, the tank *sh* and water in a mass are dark blue or green with black ripples. To any one accustomed to the yellow-brown, opaque waters of the Nile such colouring would be unnatural. Does this colouring not seem then to have been fixed by dwellers on the clear, dark waters of the Red Sea?

48. Buildings are the next division; and from the hieroglyphs we learn far more of architecture in the dark period of the first three dynasties, than we can learn by actual buildings until the XVIIIth. Buttressed walls were usual for forts, as the sign is of the same form as the later determinative (XIV, XV). The cornices of the law courts were already crowned with a row of uræi, as shewn in the sign *ta* (XX, XXI). And in the types of columns we see the same highly advanced forms. The sign *an*, which is often called an obelisk, is seen here to be a fluted eight-sided column (Front., X, XIII), with a tenon on the top to fit the lintel, and painted black below, then white with an ornamental edge, and red above. This form is not yet known in the round until the XIIth dynasty. Next the sign *aa*, usually called a spear, is remarkably detailed here (XIII) and is seen to be absolutely identical with the central support of the



roof in *heb* (X), which sign has also octagonal fluted columns at the sides. The *aa* it will be seen has the tenon on the top like the *an*; from its slenderness and general form it was certainly of wood, and it appears to have been the great central pole of a tent or canopy, carved into the form of a lotus plant. This then was the origin of the lotus columns and capitals, with the curious inverted flower or bell, which are so often found in the XVIIIth dynasty. Other forms of columns were also known in the IVth dynasty; I have published a remarkable column with wide capital, apparently derived from the form of a bowl on a stand (Season in Egypt, PL. XXV), carved in the tomb of Khafkhufu at Gizeh. And another, not dissimilar, is seen on a wall-painting at Kahun in the XIIth dynasty, but with a banded top (Illahun, PL. XVI). Now on the *dad* (or *tat*) sign (PL. XIII) we see a tenon on the top, an evidence of a column; and abstracting for a time the repeated forms of the top, we see that the main body is much like the column drawn at Kahun. What then is the meaning of the multiple top? In representing objects which were not all in one plane the Egyptians used certain conventions, and one of these was that *parts that were behind others were placed above them*; this is seen in the drawings of groups of offerings, the birds, vegetables, &c., being drawn one above the other, to represent that they lay one beyond the other on the table; it is seen in the wall-painting at Kahun (Illahun, PL. XVI) where the interior with the master and servant is drawn above the front view of the house; and it is the elementary convention of all wall scenes (as Prof. Maspero has pointed out), that the Nile, the cultivation, the near desert, and the far desert, succeed one another up from the base to the top of the wall, in registers one over the other. Regarding this regular convention we can hardly neglect to see that the *dad* is a row of columns one behind the other with the capitals shewn one over the other; the line of columns to support a roof being necessarily particularly stable and firm, and according with the meaning of the sign. From all these we can form some idea of the lost architecture of the first three dynasties; there were octagonal fluted columns of stone painted in bands, columns with capitals of the bowl and stand type, similar ones with capitals of the *dad* type, and slender shafts of wood of the lotus type. Such forms cannot have been introduced as familiar signs in syllabic writing until they were well established as regular architectural members; and we are left in amazement at the fully developed and completed

types of decorative architecture which these reveal to us at so remote and unknown an age.

Granaries are shewn in Nefermat's tomb (XX, in list of offerings). The form of the door-bolt *s* is remarkably contracted in the middle, and has a double line along the nick (XIII); such lines usually shew a string, as on the tied-up necks of bags (XIII, XV), and here it seems likely that the middle of the bolt had a string round it, which could be sealed on to the door to prevent it being moved.

49. We next turn to weapons. The axe, *mab*, here (Front, XIII, XIV) bound into the handle, seems from its outline to be a stone hatchet, as both form and colour are much like the blue grey hornstone hatchets which I have found at Kahun of the XIIth dynasty. The dagger in sheath *tep* is of the usual type. The bows appear in a bow case (IX); but it is curious that the *mesha*, archer (IX), is clearly a Lybian in type (? connected with the name Mashuash), and he bears a bow of different form from the Egyptian, in one case (IX) with the string broken and hanging partly from each end. The arrows both of the archer and elsewhere (IX, XIII, XX) are all flat ended, probably tipped with small flints to cut chisel fashion. The *aha* sign of the arms holding a shield and mace, shews that the shield had straight sides, but was either curved (XV) or straight (XII) at the top. The mace is evidently the *het'* sign (which has been classed as a vegetable), and it is well shewn in separate examples (XII, XIII). We recognise the yellow staff, the red binding, and the white stone head, with the yellow staff-end projecting. Such a mace head of very hard white limestone I found at Kahun (XIIth dynasty), and a piece of one of bright white stone (magnesite?) with the names of Khafra, I picked up at Gizeh. The particular whiteness of the heads of those I found, and in the drawings, shews why this was taken to express brightness or whiteness. The harpoon, *ua*, is very well shewn (Front., XIII, XIV); the body being red, probably of wood, the point blue for copper (like the copper cauldrons being blue, see XIII), and the loop is of cord, as is expressly shewn on the tomb of Rameriankh in the Ghizeh Museum.

Among the agricultural implements the sickle, *ma*, is the most interesting. It is always green in the body, with a projecting line of teeth, drawn black on white (Front., XI, XIII). This is explained by the sickles which I have found of the XIIth dynasty; they are carved in wood, with notched flints inserted for teeth; such then was the nature of the sickles of the IIIrd dynasty, though why they should be painted

green it is difficult to understand. The obvious origin of this sickle is from an ox's jaw with flints substituted for the animal teeth. Such was a wide-spread implement in the later stone age, as we see from the innumerable flints in Egypt and elsewhere; these are notched on the edge, and shew by their polish that they have been set in a groove socket, and worn on a hard material like siliceous straw. A whole class of matters has been cleared up by these flint sickles which we see drawn in the sculptures. In one tomb-well here over a hundred flint flakes were found. The hoe, *mer*, is of the usual type: but one instance (XV) may be a natural hoe, such as I have found in the XIIth dynasty carved out of a natural branch like perhaps the hoe on XXI. The plough (XII, XVIII) has always two handles, similar to our modern ploughs, and unlike the Roman plough which had a sort of rudder head for guiding it. An article fashioned from a natural branch, with a pole bound on to the fork of it (XII with the pole, and in XIII without the pole), is seen several times; but it is not commonly known, and probably fell out of use in early ages.

Of tools there are several. The chisel *menkh* which became very much corrupted in late times, is well drawn here (Front., and XI) and is unmistakable, as there is both the name and the use of it represented. The handle is of turned wood, with a copper blade inserted. Another form of chisel is the *mer*, often occurring in the title *smer*; it varies in form, sometimes a wide-headed handle with a spike-shaped blade, in others a barrel-shaped handle (XVIII, XX), but most noticeable is the barrel handle with a projection on one side, and the blade excentric (XXIV) and shewing in one case by the side of the handle; this seems to be of the same family as the adze (so familiar in the *sotp* sign) where the blade is not inserted but attached to the handle; here apparently it is secured by a band of metal around it, as the projection is sometimes green; the handle is regularly yellow, being wood, and the blade black. The *nenu* or adze occurs on a grand scale where a carpenter is using it (Front., XI, XXV), and also in the *sotp* sign (XI); the blade is attached to the wood by a long binding. I have much such a blade nearly a foot long, and four inches wide; and I have found the blades in the IVth, XIIth, and XVIIIth dynasties, varying in form. The so-called polisher *t* is always black; such polishing stones are rarely, if ever, found; but black stones of exactly this shape are very common in early times, with a highly worn hole in the

flat side; these were doubtless the stone caps for bow drills, and for fire sticks, and we can hardly err in calling *t* the drill head. The *maa* sign (XVI to XXI) which is commonly recognised as a cubit, is long, thin, and square ended, plainly the side view of the cubit; this being confused with the *ta* sign of land, an end view was later adopted, and the bevel, which is characteristic of the section of a cubit, was thus added to the sign to distinguish it. The somewhat variable sign *sem* (XIV), often classed as a knife, is undoubtedly a sharpening stone for whetting knives; it is represented as so used in early tombs, and it is a stone, and not metal (or a steel), as it is secured by a knob at the end and string binding, instead of passing the loop through a hole. The stick for winding string upon (Ranefer XIV) is perhaps what is otherwise known as *ud*. The sledge for dragging stones, *tem*, is of the usual form (XX); and I have found pieces of such sledges, of hard wood, joined by mortise and tenon, among the stone chip filling-in of the pyramid of Usertesen II at Illahun. Two forms of the sign *net* occur, one the knitting-needle (XIII, XV) such as I have found of wood and metal in the XIIth dynasty; the other what is usually called the shuttle, but which is a complex affair, that seems to have handles at the end, and to be bound round with crossing bands (XV); this is the usual emblem of the goddess Neit.

50. Three forms of sceptre are shewn; the *uas* or *t'am* (XIII) has no animal head, as is usual later on, but is merely the natural stick branching from the main stem and subdividing at the tip; the *hek* does not seem to be a crook as usually supposed, but a bent rod, bound around (X, XXVIII, 6); the *kherp* is as usual. The important divine sign, *neter*, is hardly yet explained; that it is an axe is impossible; the later idea of its being a roll of bandages on a stick is not satisfactory, as such an arrangement would be very awkward to use in swathing a mummy. Here there are several varieties. The top is plain with a simple rod (XXIV), or with a rod ending in a ball (stela XVI); the top is divided into two strips in five instances (XV), and into three strips with a cross line in one case (XVI); the colour is yellow, with the lower end of the rod black (XXIV). The ball at the end, the slope at the top, the division into strips, the colour, and the cross bands on the handle, all render it a difficult problem, although it is classed with textiles in the early lists of offerings.

Of personal ornaments three are now explained. The well-known sign of "chancellor" (*sahu*) is now seen to be identical in its two forms, the upright loop

and the curved loop (Front., XIII, XIV, XVI, XVII, XVIII, XX); and in the finely carved and coloured example (Front., XIII) it is clearly a string of beads alternately long and round, green and red, with an object attached; this object appears to be a cylinder of dark blue-green, with yellow ends, and a red knob below; and the nature of it suggests a signet cylinder of green jasper, with gold ends, and a central pin with a red jasper knob, to hold it in. It means then essentially the seal, and the title must be the royal seal-bearer, and hence treasurer. The sign *nub* was long explained as a cloth for washing gold; but it is unmistakably a grand collar (XIII) with rows of green, red, and black beads. As gold was probably first used for ornament around the neck, the collar naturally came to be the sign for gold. Another familiar object is the shoulder fastener for garments, which is here identical with the sign *seta* (XII, XIII, XV); the manner in which it was used suggests that it was a spiral coil of sheet metal, into which could be slipped side-ways the thin part of a garment.

The draught-board, *men*, is well illustrated in these sculptures (XI, XIII, XIX). It is regularly divided into 3 squares one way and 10 squares the other; and this carries back the use of this 3 × 10 board to the IIIrd dynasty. As I have found these boards also in the XIIth, XVIIIth and XXVIth dynasties, the game was known for four thousand years. The board is shewn in plan, and the row of pieces in elevation on the upper edge; these pieces are of two sizes, the larger white, and the smaller, some red, some black; or the larger green, and the smaller as before; there were thus three kinds of pieces used, and from the numerals on boards I have found we see that they counted from left to right along the top row of the board. (Kahun, p. 30.)

51. Among the rope and band signs the *t*, *h*, and *shes*, all occur in usual forms. But a point which has not been noticed is that the numerals are all pieces of rope. The unit stroke is not a line, but a piece of rope, with the lower end frayed out to shew it (numbers on stela, XVI). The ten sign is exactly the shape of a rope tether, such as is used to express a tame animal (IX, XXIV). The hundred is certainly a coil of rope. And though the origin of the thousand sign is not clear, and it seems more like a plant, yet it was expressed by *kha*, "to measure," and a "cord for measuring." If then all the system of numeration is derived from rope or cord, we are led to conclude that the primitive Egyptian notation was by a knotted cord. Another remarkable point of notation here (as

is also seen in other early tombs) is the sign for a continued series. We write for instance 1, 2, 3, . . . . 100 to denote all numbers up to 100, or 1, 3, 5, 7 . . . . 45 for all odd numbers up to 45. So the Egyptian wrote 1, 2, 3, 4, 5, 6, and then drawing a bar divided into a multitude of small parts, he placed 100 below it, to denote all the other numbers up to 100 (stela, PL. XVI). The sign *sa* (back) is here made clearly not like a backbone (XIII), with which it was sometimes identified. The long mid line of it is continuous, and the other loops are attached to that (XIII). It is possible that this is the wide band that goes behind the climber in ascending palm trees; it is most emphatically that which backs or protects him, and as such would be a suitable sign. The package, *p*, is shewn with wavy lines of cord around it in the fresco (XXVIII). The cartouche line, which has not been explained, is drawn on a slab of the VIth dynasty at Gizeh Museum as a rope binding, lashed together at the bottom, and with two bows which form the spread base of it. We can see that rope lashings were used on a very large scale, as the whole of a stone trap-door was girded with no less than 80 turns of rope, in Ranefer's tomb; so this rope lashing of the cartouche, to bind together the group of signs of a royal name, is not an unlikely idea for early times. The sign for a clap net (X, XVIII) is what has been classed as a framework: it represents the two sides of a net. The symbol of life, *ankh*, is shewn with a divided upright (XIV), and in a fine example in Gizeh Museum the side parts are likewise split. It appears (as Prof. Sayce has suggested) to be the fisherman's girdle with the loop passing round the waist, and the loose flaps hanging from it; this is the marsh-dress such as the Nile figures wear, and as we see in the figures of fishers, &c. (X, XI, XVIII). A sign hitherto unexplained is the familiar *hotep*. It is derived by the same system as the sign of the *men* board and pieces; the mat of green rushes lashed together with yellow cross strings is shewn in plan, and above that in elevation is the offering-dish piled up with flour or other food which was placed upon it before the tomb or shrine. The green mat and yellow strings are finely shewn in several cases (XIII, XIV). The reel for winding rope on is shewn in many of the figures of bird catching, at the free end of the rope (XVIII, XXII). Several other signs here remain as yet unexplained, though the detailed colouring of *kher* (XIII) and *ta* (XXVIII) ought to help us to guess them.

We now see how much light we have gained from

the study of only two tombs; light both on the sources of hieroglyphs, and on the civilisation which filled the unknown age of the first three dynasties. Far more work is needed on the early and fine sculptures to secure their details, and above all to record the colouring before it drops off in the air, or is washed away by some barbarian taking wet squeezes from the walls. Nearly all the colouring in the lower part of Rahotep's tomb was thus destroyed, and Mariette used the squeezes of it.

## CHAPTER V.

### THE SMALL ANTIQUITIES.

52. The positions of the various objects found have been described in the previous chapters, but here we shall notice the details of the objects in the order in which they stand on the plates.

PL. XXIX, 1 to 5. Hawks found in the temple of Seneferu. It is not likely that such peculiar offerings would continue to be made on purpose long after the death of the king; we have seen that the offering of small vases and saucers ceased before the mastaba 18 was constructed; and probably as each king died the worship would be transferred to the last deceased. Moreover all these hawks are different, and must have been specially made for offering here, and yet all by different hands; if offered till later times there would probably have been one factory for them, and they would have been all alike. The character of the glazing of No. 3—a clear light purplish blue, with dark purple stripes—is also early, and cannot be of the XVIIIth dynasty, nor hardly of the XIIth. I think probably therefore that these are contemporary with the decease of Seneferu, and the oldest small figures known. The base of a statuette, 6, will be noted by Mr. Griffith in the inscriptions; it is of black serpentine. From both the offerer and the town being named after Seneferu there is a probability of its early date, and it might well be of the IVth dynasty. The lower part of a basalt stand, 7, is evidently a copy in stone of a pottery form, such as XXX, 21. The hole in it is one of three around it, and copied from the hole cut with a knife in the pottery. Both of these seem to have originated in a wooden form, as the hole seems to be the space left between joining pieces of wood; and is not likely to arise as a mere decoration in pottery. It is the regulation type of table stand as seen in the sculptures (PL. XIII).

No. 8 is a potsherd of the XVIIIth dynasty with an hieratic inscription, which was written when it had been broken to nearly the present size. Mr. Griffith will deal with this in the inscriptions. There were also in the temple many blue beads of the XVIIIth dynasty, two bronze lance heads, and dried fruits, from the burial there.

No. 9 is a polished piece of ivory of unknown use; it seems like a toilet object, but the teeth are too small for a comb; possibly it was a skin-scraper.

No. 10 is a horn handle of a mirror, probably of the IVth dynasty.

No. 11 is the adze blade which is certainly of the old Kingdom, and perhaps of the IVth dynasty. The type varies from those of the XIIth and XVIIIth dynasties. The bevel edge is already fully developed; and the thickness of the head suggests that it might be struck by a mallet.

No. 12 is a fragment of a rude saw; the notches do not join, and may have been made with a flint edge. It was broken off anciently, and wrapped up in a piece of linen tied together, to preserve it. I found it among the broken stone and chips, which were thrown in to make the ground level at the north of mastaba 17.

No. 13 is a rude plummet of soft white limestone, hung by a thread passing round it; this was found among the stone chips which form the mass of mastaba 17, which is probably contemporary with the pyramid. Many pieces of linen were also found among these chips; some of it coarse and saturated with ruddle, which may have been used to rub ruddle on stones for colouring, or for masons' marks.

No. 14 is a small bronze chisel of the type of the XIXth dynasty; found low down in the pyramid rubbish it was probably lost by the workmen of Ramessu II when stripping the pyramid.

The find of objects in a well of mastaba 8 has been described. The four alabaster bowls are all alike (15), though but one is perfect. The pottery (16) has a smooth dark red face. The shell (17) contains powdered blue carbonate of copper, as a paint; and two similar shells empty were found with it. The needles (18, 19) shew the thin and thick types. The flints were all kept separate in lots as found, until they were examined; they proved however to have been mixed together after manufacture, and re-divided. Mr. Spurrell examined them and succeeded in restoring the arrangement of seventeen in one block (20, 21), which shews the exact order in which they were struck off with unflinching regularity. The different types of

flakes are shewn in 22 to 26. For the first time we have here dated flints as far back as the beginning of historic Egyptian archæology. The three other flints, 27 to 29, were found on the surface, among the desert stones; but as there were a hundred more chances of their being dropped when the place was crowded with workmen in Seneferu's time than since it has stood desert, there is a presumption in favour of their being of the IVth dynasty. The portion 27 is a knife handle of the type of those found at Kahun of the XIIth dynasty.

53. The pottery (PLS. XXX, XXXI) is quite different from that of any later period that I have yet examined. The most distinctive point is the highly polished red face to the bowls, the thinness and hardness of them, and the sharp outlines (XXXI, 2 to 6). This ware I have noticed before (*Archæological Journal*, 1883, p. 271); it is very fine, and all but equal to the best Roman, far better than what is called "mock-Samian." These bowls are the commonest type of all, and are made both of this fine quality and also coarser; in forms with beaded edge, or turned in or with a lip, (XXX 1-6, 9, 10, 12, 13, 36; XXXI, 2-6). A hard drab ware was also made (XXX, 11), and in some pieces it has been heated until the surface is half fused. It is certainly of the earliest here, as a piece was found in the waste heaps of the pyramid masons. The small cups on stems XXX, 14, 16, are curious, and unlike later forms; the bowls accompanied them, 15 with 14, and 17 with 16. In 15 is a quantity of hæmatite paint. The other pottery with these was of early style. There is some doubt about No. 19; it was found isolated, and is much like some of the XXIIInd dynasty. The tray, 20, of very rough red pottery was evidently made to go on a pottery stand such as No. 21. The small vases and saucers 22 to 27 were all found in the filling of mastaba 18, from the offerings at the pyramid. Such are also found in the places of offering at the tombs here, and at the pyramids of Gizeh and Dahshur.

The occurrence of marks on pottery, so far back as the beginning of the IVth dynasty, must be taken account of, in considering the rise and origin of the marks so often found in the XIIth and XVIIIth dynasties. The figures here, Nos. 28 to 34, are all drawn the same way up as on the pottery. 28 and 30 do not occur in the signs I have collected before; 29 may well be a part of the fine pointed star (Kahun, XXVII, 182); 31 is the hieroglyph *as*; and the cross in 32, 33, 34, XXXI, 9, 27, is a naturally frequent sign.

The deep pan 35 of rough brown pottery was found with the fine hard brown white bowl 36, and the rough light brown XXXI, 8; along with the ordinary kinds of red bowls, &c, in mastaba 22.

54. In PL. XXXI the bowl 4 is the only perfect example of the fine polished red-faced ware, though many pieces of this were found, varying somewhat in outline (2, 3, 5, 6, 7). Such pottery I have found at Gizeh of the IVth dynasty; though from some of it being on the surface there, I was inclined to place it to the Roman age as well as the IVth dynasty. No. 9 is one of three large pots found in the E.N.E. mastabas, and bearing a cross on the shoulder and on the bottom; these are roughish red pottery. No. 10 is bright red, not polished. 11 is of rough, thick, soft brown ware. 12 is a curious form of stem, not found in other cases here, and much like late pottery; but its age is certain, as it was found in the stone-chip filling of mastaba 17. No. 13 is of rough, hard, blackish red pot from the filling of mastaba 18, and therefore early. The rude hand-made pottery 15, 17, 19 is very characteristic; it is constantly found in the tombs at Medum, and also in the rubbish heaps of Khufu at Gizeh. The form 15 is that which is shewn in early statuettes of a potter, squatting down and forming a pot with one hand inside and one outside. 17 is a very peculiar shape, the upper part being smooth, and the bottom always rough and irregular. From being always found by tombs it seems as if it were for setting in the sand to pour offerings in. No. 20 is of a hard pale red-brown ware, which is peculiar; it is scraped all over the outside in various directions, and therefore seems as if it was hand made, although very regular. 21 is one of the large pans with a pipe spout, of which pieces occur in many groups here; this is fixed to the date of Rahotep, as it held the mortar used for closing his tomb, and was found in the bottom of his pit. Other forms of spout are shewn in Nos. 22, 23. 24 is a thin bright red pottery; and 25 is rough brown, with a curious ledge round the inside. Many pieces of rough limestone were found in the builders' rubbish about the pyramid, bearing large drilled holes (XXXI, 26). The holes are on both sides in most cases, without any order, often intersecting at the edges. It is certain this is a waste product; and as it was produced by some body rotating under heavy pressure we are led to attribute it to some arrangement for moving the stones. Any fixed crane or lifting machine would pivot on a large stone, or in the rock. But it seems possible that blocks might be moved by lashing them to the short end of

a lever bar, which rested on a pivot near the block ; by a gang of men pressing on the long end, the block would be lifted, and could then be transferred by the men walking and rotating the lever on its pivot. Such an arrangement would need a movable bearing to be shifted onward at each lift, and these blocks might well be for such bearings.

The two vases 27, 28 were found in the rock-cut tunnel leading to the building of unknown purpose south of the pyramid. They are intermediate in character between the pottery of the IVth and the XIIth dynasties, and may well be of about the VIth dynasty. The rough implement of black hornstone is one of two found in the rubbish of the destroyers on the east of the pyramid, at some distance from the base. It is therefore certain that these belong to the rude plunderers of stone in the XIXth or XXth dynasties. They are like some implements which I found at Gizeh ; those bore signs of having been worked up out of more ancient wrought stone, and in that case also therefore they were not of a primitive age.

55. Dr. Gladstone, F.R.S., has very kindly favoured me with the results of his analyses of the metals which I collected at Medum. His report is as follows :—

“1. The broken piece of an adze. The (freshly) broken face was very uniformly granulated ; while the outer surfaces were dark red, as from suboxide of copper. The specimen consisted almost entirely of copper ; only 0·38 p. cent. of arsenic was found, with traces of antimony and iron. There is some sulphur, no doubt from imperfect reduction of the ore ; but no phosphorus was detected, nor any tin.

“2. The borings from an adze from the well of Rahotep. (PL. XXIX, 11.) These again were almost wholly copper : 0·54 p. cent. of arsenic was determined, with traces of antimony, iron, sulphur, and probably phosphorus ; but again there was no tin.

“3. Piece of cylindrical rod found in mastaba 17. This consists of an internal core, and a dark outer ring. When examined under the microscope the core is found to consist of miscellaneous granules very various in colour ; the outer portion is also heterogeneous, containing a red suboxide spotted with green and patches of blue. This was found to contain the large amount of 8·4 p. cent. of tin, with mere traces of antimony, arsenic and iron ; no phosphorus was detected. This must, therefore, be looked upon as the earliest specimen of bronze. It is so very interesting that I am making a more complete analysis of the core, which I will send when ready.

“4. The dark filings from a pick found at Gizeh. These were too small in amount to be examined with accuracy. They consisted however of copper with a little arsenic, and a trace of what may have been either tin or antimony.”

I should add that the specimen 1 was presumably of the IVth dynasty, or early, from the form, and being found at Medum. No. 2 is certainly of the old kingdom, and probably of early IVth dynasty. No. 3 is the critical matter. It is a bit of rod hammered square with truncated edges, 0·37 across and about 1½ inch long. The ends merely rough ; slightly tapering, and hollowed on the end, evidently the result of hammering out. The piece was found low down in the deep foundation filling outside the N.W. corner of mastaba 17 (see sects. 21-23) ; and, if this position is beyond doubt, it must be of the age of Seneferu, as the chips of the filling are the masons' waste from the pyramid. The only doubt can be on whether it fell in from above during the work, as I did not find it myself. The sides of the excavation were of brick wall, from which it could not come, only the filling at the ends could be in question. The concretions on it are of clean large grains of sand and chips of limestone, quite free from fine wind-blown surface dust, agreeing with its deposit in the bottom of the foundation space. The corrosion on it is very slight, indeed I have seldom seen bronze less attacked, and certainly not where it was in contact with earth : this strongly shews that it cannot have been dropped and lain on the surface exposed to damp and air in later times. And moreover no work was done at this part after the building ; no workmen appear to have been about this mastaba : and yet this is plainly a workman's piece, probably for a dowel ; and it was not a tool used by people in general. There is then no reason to doubt the evidence of it as being of the IVth dynasty. The presence of bronze in a stray piece, and not in tools, seems to point to some civilisation external to Egypt from which it had come by trade. No 4 is from the tip of a pick, which I found concreted by stalagmite in a tomb at Gizeh never exposed since the pyramid period.

## CHAPTER VI.

## THE INSCRIPTIONS.

By F. LL. GRIFFITH.

56. PL. VIII. The short inscriptions against the architect's lines read *meh* 5 (and 8) *kher nefru* (or *kher n nefru* and must mean "5 (and 8) cubits (respectively) beneath the ground-level," or possibly "beneath the intersection (of the two lines)." The former rendering, which suggested itself to Mr. Petrie, seems preferable and leads to a good translation for a passage in the Papyrus Abbott (spoliation of the tombs at Thebes) p. iii. l. 12. "It was found that the thieves had violated it (the tomb of king Sebekemsaf) tunneling along the *ground-level ? nefru* of its pyramid from the exterior hall of the tomb of Neb-Amen."

57. PLS. IX-XXVIII. The inscriptions of the mastabas.

In preparing this account I have referred to the plates of MARIETTE, *Mon. Div.* PL. 16-20, to the same author's *Mastabas*, pp. 468-487, VILLIERS STUART, *Nile Gleanings*, the notices in Baedeker's Handbook, and other sources of information, in order to ascertain what signs or groups could be recovered beyond those found still in place by Mr. Petrie. It is a pleasure to find that there is not a single sign in the new copy that one can regard with suspicion.

PLS. IX-X. The titles of Rahotep, as given very fully on the architrave, may be compared with those upon the celebrated group of the husband and wife in the khedivial Museum (*Mon. Div.* PL. 20, *Mast.* p. 487). Rahotep, who was a "king's son of his body" (his royal father's name is not stated), must have lived in the reign of Seneferu, or at the latest in that of Chufu. Three of his titles are of known import—"high-priest, *ur ma*, of the Sun at Heliopolis," "member of the Southern tens" (the tens being apparently the name of a council consisting of four tens, making forty members), and "captain of the host." As high priest at Heliopolis Rahotep was certainly one of the leading men in the Egyptian hierarchy, but "captain of the host" is a title that might apply to several military grades, general or local, although I suspect that Rahotep was commander-in-chief: "member of the Southern tens" does not imply a very exalted rank. Of the other titles, fourteen in number, which Rahotep bore, several are partially intelligible: from these, however,

nothing of value can at present be deduced, excepting that some appear to denote authority in particular districts.

Turning now to the scenes, we see the king's son Rahotep accompanied by the lady Nefert, a "royal acquaintance." Upon the stela of the outer court (PL. XII) is an inscription which probably is to be read "the royal acquaintance, the king's son of his body, who has attained the reward of merit, Bu-nefer." The name of this individual does not appear in the stone chambers of the tomb, and his connection with it is not explained. A rare peculiarity is that he should be called a "royal acquaintance" as well as "king's son."

Rahotep's children are all designated "royal acquaintances." The sons are Atu, Deda, and Neferkau, the daughters Satet, Nedem-ab and Merert (PLS. XIII-XV). It has been reasonably supposed that the term "royal acquaintance" was appropriated to the grandchildren of kings: but there are a few cases in which a "royal acquaintance" or a "true royal acquaintance" is certainly not a royal grandson by either parent, so it is perhaps best to consider the phrase as denoting personal friendship with the king as opposed to mere formal intercourse.

Rahotep and Nefert are "watching the chase" in the upper row of PL. IX. This scene, like all the others, is much abridged: we must imagine, what we can see in later tombs, that a portion of the desert has been fenced in, probably forming a decoy or battue-ground rather than a park. In the lower row "the stock-farms of the house of eternity" are presented to their owners' view. The "house of eternity" of any individual appears to mean the estate settled *permanently* for the construction and service of the tomb.

In PL. X they "watch the netting of waterfowl," in which diversion their sons "Atu" and "Deda" are actively engaged.

PL. XI. "Rahotep watches . . . . . of the house of eternity" (compare PL. XXV for the same difficult expression). The men are *spt* "lashing" the planks? of the boat together (*spt* is commonly used of binding together bundles of reeds to form rafts and boats), and *mnkh* "using the chisel," perhaps only to tighten the cords by forcing them on to a wider portion of the vessel.

On the right side is the name "bullock?" over a hornless beast, and on the left, behind the oryx, "bringing offerings," while over the animal is *rn*, meaning perhaps "stall-fed." Next *sotept* "cutting



off the choice portions" from an ox, and in the last compartment the mysterious expression *per-kheru* for "funereal meals;" the first servant carries "wine," the legend before the second is "bringing sweet things."

PL. XII. In the second row two men are "carrying an *aha* ('fighting')-fish." The accurate representation enables me to identify it as the *keshr* of the Arabs (*Lates niloticus*). This great species of perch attains a length of 5 feet according to Dr. Gunther in his work on the fishes of the Nile (printed in Petherick's Travels), but its extreme length is given as no less than 10 feet in the probably inaccurate account of the Description de l'Égypte, where it is figured (*Hist. Nat.* i. PL. IX). Anyhow the artist at Medum is not guilty of serious exaggeration in allowing its tail to drag on the ground while its lip is raised level with the bearers' shoulders. The fish is named in the great medical Papyrus Ebers, and an argument for a different reading of the sign *aha* has been founded on an erroneous identification of the species, so this marvellous piece of early painting is of importance in more ways than one.

In the next compartment is "ploughing," and below are the domains, some of which we have already passed by in the preceding plate.

In the very earliest tombs the estates of the deceased are named and represented as slaves, male or female according to the gender of the name. Later, in the Vth and VIth dynasties they were all alike symbolised by female slaves, and after the end of the Old Empire they are no longer individually recorded. These names must have had very little stability and probably they seldom survived more than one or two generations, so that the record soon became meaningless. Sometimes the names of the nomes in which the estates lay are mentioned, shewing that they were spread widely over Upper Egypt or the Delta, but at Medum there is no indication of their position. Those of Rahotep and Nefert (PLS. XI, XII, XV and one in XIII) are severally designated as "the temple," "the place of pots," "the red," the "herb-producer," "going-growing (*crescit eundo*)," "entrance-barred," etc., etc.

PL. XIII. In the niche is a prayer to Anubis that the deceased "may come to the West as possessing perfection," the West being the land of the sunset and of departed souls.

Over the table of offerings are the names of "incense, green eye-paint, wine, figs," and other offerings are below. At the side are enumerated various sorts

of linen, viz. *neter*, *sunu* and *aa*. In PLS. XVI and XX we see also *dema*, and in XX again *nefer-res*. Of each variety there are different qualities, marked e.g. 100, 9, 5, 3, 2, 1 (the numbers referring perhaps to the strands in the thread) and 1000 pieces of each quality are set down.

At the sides there are wonderfully detailed lists of the furniture, accoutrements, and unguents belonging to the tomb. On the right are jars, perhaps of sacred oils, and vessels and other objects in *uasmu* (gold or electrum) and silver, the former metal preponderating; amongst them is a ewer and basin of *uasmu*. On the left are vessels, also a sedan-chair *utes*, a footstool with sandals? upon it *ma*, and various seats and stools, a table, a box *hen*, writing-case *kher-a* and draught-board *sent*. These named figures will be valuable for reference in the future, but as yet there is not much possibility of illustrating them from other sources. It would appear that most of the names became obsolete soon after the IVth dynasty. The lower half on each side is occupied by things pertaining to the "treasure of the house of eternity." They include a second series of the sacred oils?, and on the right are vessels principally of stone—"limestone?," "blue stone," "granite" and "alabaster."

PL. XIV. The animals are the oryx, stall-fed? *ren*, the addax *nudu*, and the ibex *naa*. The last is led by a figure representing one of the estates, but the name cannot be read. The six figures below are the treasurer? Demd, the butcher? Sen-ankh, Sesa, Dauf, Anta and Sabu.

On the fragment from "Ra-nefer" we see some names or portions of names—Nebef, Rud, Kheft.

PL. XV.; with the offerings of Nefert compare PLS. XI. and XIII. We may note especially that on the right side, top row, below the figure of a man pounding with pestle and mortar there is a clear representation of a pair of corn-mullers with the name *akh*: the same utensils figure in PL. XIII, top line on the left.

PL. XVI. Stela of Heknen, a "royal acquaintance." The confused inscription seems to be "his estate, the royal offerings which it brings daily: (the estates named) Sunu-ta and . . . ta, (the offerings) incense, sycamore-figs," etc. The fragment on the left runs "the ka-servant Persen," who was doubtless represented with an offering.

The lintel of mastaba No. 7 shews a number of titles which, so far as they are preserved, agree with those of Rahotep: the deceased was "captain of the host" and "superintendent of labourers?" and of "transports?" like Rahotep, and a fragment of a new



title remains that probably refers to the neighbouring lake of the Fayum under the designation "lake of the crocodile."

On the other hand the titles of Nefermaat, whose inscriptions begin on the same plate, have no single point of contact with those of Rahotep. He must have been a greater man than the latter; he was "eldest royal son, chief justice" and in the hierarchy "priest of the goddess Bastet, of Khentsetet, of Khem, of Thoth and of the Mendesian ram" (compare PLS. XX, XXI). On PL. XX he is said to have "discharged every priestly function:" he was also "superintendent of all works of the king." Nefermaat held the general dignities implied by *rpa*, *ha*, *ari-nekhen*, and royal-treasurer? and it is remarkable that Rahotep had none of these.

PL. XVII. Nefermaat's wife was "the royal acquaintance Atet:" the "royal acquaintance Nub" of PL. XIX was perhaps a second wife. Their children were distinguished. The short titles of the eldest son Henan prove that he enjoyed several offices that were held also by Rahotep: the second, Asu, was *am-a* and priest of some goddess (PL. XXIII), while the other members of this numerous family were called "friends of the king" *semer* or "royal acquaintances" *rekh suten*: their names are Ankerhend, Ankhreshetef, Serefska, Teta, Khent (who appears to be entitled "superintendent of the lake of the crocodile" but the position of the signs makes this doubtful), Uhemuka, Shepseska, Kakhent, Deftsen, Atisen, Ankaf, and a daughter . . . gaut.

PL. XVIII. There is a fragment of a remarkable title in front of Nefermaat which was visible formerly also on the lintel of Atet (PL. XXII). Mariette shews it more complete, and his copy is confirmed by the useful sketch of the niche in Mr. Villiers Stuart's *Nile Gleanings*, PL. G. It may be read perhaps *ud ser neb* "commanding every noble."

PL. XIX. The topmost figure on the left represents the estate called Menat-Seneferu, "nurse of the king Seneferu." It is noticeable that a city or estate near Beni Hasan, called "nurse of king Chufu," Chufu being the successor of Seneferu, played an important rôle in the early Middle Kingdom. Possibly this Menat-Chufu was an estate of the usual type to which the name clung with unusual tenacity.

Another estate-name on the same plate (bottom row) has been credited with being the earliest form of Medum. It contains the elements *m t w n* (determined by an ox), and the conventional transliteration

*metun* has a curious likeness to Medum; but that is all: we do not know even whether Metun lay in Upper or in Lower Egypt. The modern name of the place was indeed sometimes written Medun by early European travellers; the ears are often deceived as to *m* and *n* in a new name or word, and Makrizi (Khitat i. p. 112), quotes from an older Arab author a passage referring to the pyramid of Medun (with *n* and short *e*)! but both ancient and modern authorities, Makrizi i. p. 119, the list of villages published in De Sacy's *Abdellatif*, and the new census of 1882, give Maidûm, corresponding exactly to the modern vulgar pronunciation Mêdûm. Thus writers who are or were familiar with the place agree in final *m*; casual travellers may confuse the two sounds *n* and *m* in a village-name, but natives of the place do not, so that it is useless to compare Metun with Maidum. There is better reason for supposing that Mertum (really pronounced Maitûm) is the ancient equivalent of the name. Ancient *t* is constantly equivalent to modern *d*, and we know the position of the town from the inscription of Piankhi, which places it in this neighbourhood on the West of the Nile. Unfortunately there is no new evidence to shew for this identification, which was proposed long ago.

It must be remembered that the gaps in the scenes here, PLS. XIX, XXI, have been compressed in order to get them into the plate. This circumstance affects especially the list of offerings which must once have existed in front of the large figure of Nefermaat.

PL. XXI. It is unfortunate that the estate-name towards which Nefermaat is being carried is broken away: as Mr. Petrie has pointed out, it was compounded with the name of a king. In the bottom row a boar appears. During the IVth dynasty this animal was domesticated (tomb of Amten, L. D. II. pl. v.), and it is often seen in the earliest hieroglyphs; but from the Vth dynasty onwards it is of extreme rarity.

PL. XXIV. In front of Nefermaat is a statement that has been translated "(the tomb) was made for his gods in writing that cannot be destroyed." Although this rendering may be thought questionable, there is no doubt that the passage contains a reference to the durable nature of the decoration.

In the second column servants are "bringing wine" and "figs": below are the products of the "stock farms of the house of eternity," and in the fourth compartment fowls are bringing birds? "coming forth from the papyrus-marsh."

PL XXVII. In front of the fallow-deer is the legend "bringing the tribute of the house of eternity."

PL XXVIII. There is a "stall-fed?" addax in No. 3. The domestication of antelopes in the early periods of Egyptian history is well known.

58. The inscription on the base of a female statuette (PL XXIX, No. 6) probably begins at the side: "may her name [remain, established] in peace before Uadti mistress of Asheru, Khnumu, . . . ? Neb-Sau? Horus? and the gods (or Neb-sa and the cycle of gods) who are in Dad-Seneferu, for the *ka* of (the lady) Seneferu-Kheti, deceased, possessing perfection." It is a prayer that the name of Seneferu-Kheti, represented by the figure, may remain before various deities of the place, whose titles are somewhat unusual. The chief value of the inscription lies in the place-name Dad-Seneferu. In a collection of wonder-tales, known as the Westcar papyrus, it is related that a magician dwelt there in the time of king Chu Fu. He was 110 years old and yet daily consumed the haunch of an ox together with 500 cakes of bread and 100 jugs of beer. The legendary home of this extraordinary individual who bore the same name as one of Nefermaat's sons, may be fixed with tolerable certainty at Medum.

No. 8 is an ostrakon on which were jotted down some accounts: the entries are difficult to unravel. A name Apusenb and the style of the hieratic together point to a date about the beginning of the New Kingdom.

59. In reading the graffiti reproduced on PLS. XXXII-XXXVI, the fact must not be lost sight of that a certain amount of restoration or alteration is allowable. The scribe's pen drawn over an irregular surface may leave a gap where there should be a continuous line or a blot where there should be no ink. Add to these considerations the faintness or complete obliteration of the originals in many places, and a ready explanation is forthcoming for any inaccuracies in the copies, which on the whole are so admirably legible.

On PL. XXXII, No. I. reads "Thrice beautiful is the name of the King Seneferu" (which means "making beautiful").

No. II. "Sebekhotepemsaf," a private name probably of the XIIIth dynasty.

No. III. "The scribe Antifi?"

No. IV. "Ameni."

These early records are true *graffiti*, having been scratched on the stone: the remainder were written

in two inks from the ever-ready palette of the Egyptian scribe.

No. V. "Year 41, 22nd day of Mesore, under the majesty of the king Horus Strong Bull, who appears gloriously in Thebes; the wearer of the two diadems, who prolonging his reign like the sun in heaven, the golden (victorious) Hawk who wields might, who prepares glorious visitations, the king of Upper and Lower Egypt, Menkheperra, son of the sun Thothmes III., who lives for ever to eternity upon the throne of Horus (as ruler) of the living.

"Behold his majesty is as a young bull . . . as a goodly youth of 20 years whose equal has not been produced: the god Menthu? formed him for . . . : the god Tum . . . him: the universal lord created him: he is a mighty man very valorous in the field? of [battle?].

"The scribe Aakheperkara-senb, son of Amenmesu the scribe and reader (*kher-heb*) of the deceased king Aakheperkara (Thothmes I.) came here to see the beautiful temple of the Horus (king) Seneferu: he found it like heaven within when the sun-god is rising in it: and he exclaimed, 'The heaven rains with fresh frankincense and drops incense upon the roof of the temple of the Horus king Seneferu.'

"And he says, 'O every scribe, every reader, every priest, who reads this inscription, and all people who hear it, as ye would win the favour of your local deities, transmit your offices to your children, and be buried in the necropolis of Ptah-resanbef on the west (of Memphis), after old age and long life on earth—so say ye May the king give an offering, and may Osiris, god of Busiris the great deity, god of Abydos, and Ra Hru Khuti and Tumu god of Heliopolis, and Amen Ra king of the gods, and Anubis in the shrine, who dwells in the city of embalment, the god of the west—give offerings, may they grant a thousand loaves of bread, a thousand jars of beer, a thousand oxen, a thousand fowls, a thousand offerings, a thousand provisions, a thousand packets of incense, a thousand jars of wax, a thousand bundles of linen, a thousand herbs, a thousand of every good and pure thing that heaven gives, that the earth produces, that the Nile brings from its source—to the *ka* of the Horus king Seneferu who has made good his claim? before his father [Os]iris? the great god lord of the sacred land, and to the goddess?-queen Meres-ankh.'"

The complimentary remarks on the temple are stereotyped phrases found also in the graffiti on the tombs of Beni Hasan. They are none too appro-

priate in either case: the rock-cut tombs had no "roof" exposed to the drippings of heaven, and the bare walls of the Medum temple were but little like the sky at sunrise. I imagine that the expressions were considered the polite ones for admiring or wondering visitors to make on entering a house, at least I see no other explanation for their appearance under such incongruous circumstances.

No. VI. Over the bird a name "Senefer(u ?)."

No. VIII. "Year 26, 21st day of the 3rd winter month under the majesty of the king Menkheperra, son of the sun Thothmes III., living for ever. The scribe of measuring of the king Thothmes I., Aba? . . . came and said . . . the (possessions of the) house of his father . . ." (there follows a list of land and products or offerings. It is unfortunate that this is so much mutilated).

No. X. "The carver (decorative) Fai?"

No. XI. "The sculptor Au?-senb."

No. XIV. "May the king give an offering, and may the Horus king Seneferu, and Amen-Ra, king of the gods, and Ra-Hrukuti . . . all things? grant glory? in heaven, might? on earth, drinking water in the mid? stream, breathing the sweet air of the north breeze, to the *ka* of him who follows [the feet] of the master of the two lands, Neter-mesu, who renews life and has obtained the reward of faithful service (*neb amakh*)."

No. XVI. Record of a visitor, "son of Panehsi," shewing traces of the formulæ as in No. I.

No. XVII. "Year 30 under the majesty of the king Neb-maat-Ra, son of the sun Amenhotepu III., prince of Thebes, living for ever to eternity as king established in this whole land. The scribe Mai came to see the very great pyramid of Horus the soul? of king Seneferu."

No. XVIII. "Year 30 under the majesty of the king Neb-maat-Ra, son of Amen, resting on truth, Amenhotep III., prince of Thebes, lord of might, prince of joy, who loves him that hates injustice of heart, placing the male offspring upon the seat of his father, and establishing his inheritance in the land."

This remarkable graffito suggests that the rule of inheritance through the female could be made an instrument of oppression by unscrupulous kings. A male heir would be more capable of defending his rights, and Amenhotep III. may have encouraged male succession as conducive of order: unless indeed the scribe refers only to some personal benefit gained in a suit against a female claimant.

From these graffiti and from a quantity of other evidence converging on the same point, it is clear that the pyramid of Medum belonged to Seneferu. But there are questions still outstanding: this king was most extravagant in the matter of pyramids: not only was his pyramid at Medum "very great," but he had built another somewhere! At Dahshur and elsewhere priests of the two *kha*-pyramids of Seneferu are named, and the southern *kha*-pyramid is expressly mentioned. Kha was therefore the name of each, but whether the pyramid of Medum was the southern or northern Kha cannot yet be decided.

One more remark: the graffito No. V mentions the queen Meresankh in such a way as to imply that she was wife of Seneferu. While accepting this provisionally, we must not forget that the scribe of 1500 B.C. may not have known the queens of 3000 or 4000 B.C. very accurately.

## CHAPTER VII.

### VARIETIES OF ANCIENT "KOHL."

By DR. A. WIEDEMANN.

60. The subject of the ancient eye-paint (*mestem*) was discussed from the literary side two years ago in my *Aegyptologische Studien* (Bonn, 1889, pp. 25-44), with some addenda in the *Verh. der Berl. anthrop. Ges.* (1890, pp. 48-50). Before proceeding to the study of the actual materials here, I may add some details which illustrate the uses of the *kohl*. The substance *uat'*, which often appears along with *mestem*, is named as early as in these tombs of Medum (PL. XIII) in Leps. *Denk.* II. 3; and both occur in two funereal inscriptions in the Louvre (c. 162, D. 59, in Pierret, *Inscr. du Louvre*, II. 59, 57), and on a coffin of the middle kingdom from Ekh-mim (Rec. II, 142); it also appears in the usual lists of offerings in tombs, the examples of which are arranged by Schiaparelli (*Libro dei funerali*, II, 342), from the time of Unas to the Roman age. Of the toilet boxes (described *loc. cit.* p. 35) there is an example with four divisions in Leyden (F. 50, Leeman Mon. II, pl. 32) with the purposes of the various preparations stated. On one is "for opening of the sight," the second "for expelling the tears," the third "for expelling the flower" (*herer*), the fourth "daily eye-paint." Another toilet box is edited by Ebers (*Die hierog. Schriftzeichen der Aeg.* p. 17) from the

Wilbour collection, bearing the inscriptions, "Inundation, for opening of the sight;" "Season when the fields appear, for expelling all evil of the eyes;" "Harvest, for throwing off the waters from the eyes," thus connecting the various cures with the Seasons. This probably belongs to the Middle Kingdom. According to a statement, which is not perhaps worth much, in the inscription of Sehel discovered by Wilbour, line 17, *mestem* and *uat'* were brought from the interior of Ethiopia. With this we come to an end of our literary information at the present time on the ancient *kohl*.

61. But while little advance has been made on this side, we have learned much more about the actual composition of the eye-paints: this is due to the active researches of Mr. Petrie, who in his Fayum excavations has found a long series of examples of *kohl*; with the advantage over previous specimens, from their place and age being known. Mr. Petrie had the goodness to entrust me with 30 examples; and two others (31, 32) also found by him, I have obtained through Prof. Ebers. Dr. Xaver Fischer undertook all the analyses, and will report (in the *Four. für prakt. Chemie*) the results of his careful and exact work, which was carried out in the laboratory, and under the kind superintendence, of Prof. Hilger at Erlangen. With Dr. Fischer's kind permission I now proceed to state those results of his that are of archaeological interest; for the more chemical details the original memoir should be consulted. As that however is not easily accessible to antiquarians, it seemed suitable to give here the results, which are valuable for the customs, and metallurgic and chemical knowledge, of the Egyptians.

The specimens 1-8, 28-31 are from Kahun, 9-10 from Illahun, 11-27, 32, from Gurob. As to age, 6, 7, 31 and perhaps 8 and 27, are of the XIIth dynasty; 32, and probably 28-30, from the XVIIIth; 11-26 of the XIXth (18-22 being from the tomb with amulet of Nefertari); 1-5 of the XIXth or XXth dynasty from the tomb of Maket; and 9-10 of the VIIth cent. A.D., 11-13 were in a quadri-tubular wooden stand, of which one tube was empty.

The general result is that antimony appears very rarely; but galena (sulphide of lead) is very common, both unaltered and manufactured. The powdered sulphide was gently roasted, and left so, or mixed with a slimy vegetable solution (gum), and poured as a paste into pieces of reed. Thus the sulphide slowly oxidised so long as it was kept moist. A rarer paint was pyrolusite (soft peroxide of manganese) which

was powdered alone, or in mixtures. As substitutes we find oxide of copper (obtained from roasted carbonate); magnetite (obtained by partly reducing haematite with charcoal); and for a brown, iron ochres were used. The green powders are a mixture of finely powdered silicate (either native, or an artificial glass) with basic carbonate of copper; this was doubtless derived from the natural mixtures that are found in native chrysocolla, such as occurs in Gurob. This green powder (11) was in the wooden tubular stand with ochres in 12 and 13.

The rounded grains of sand, and green and red crystalline chips which occur, are probably accidental. Resin is entirely absent; and fats have disappeared, if ever they were present. Free sulphur which could be extracted probably comes from the galena, which commonly contains some.

The eye-paints were sometimes wrapped in the leaves of dicotyledons; but were usually placed in the stalks of *graminiae*, about as thick as the finger; the internodes were cut just below the knot, and the half-liquid, salve-like mixture was poured into the tube thus formed. Vessels of alabaster or pottery were also used, both for the powders and for the pastes. The rods of paint that may be extracted are rather shrunk at one end, evidently having been slowly dried pastes or salves. The longitudinal streaks on such pieces are produced by the internal form of the reeds used to hold the paste.

62. The following are the various classes of ingredients found. *I. A. Galena (sulphide of lead)*, XIIth dyn. No. 7; XIXth, 14, 16, 18, 22, 24; XXth, 2, 3?; Coptic, 10. These are native galena, without sulphate of lead, but with some sand and vegetable remains, oxide of iron, and traces of lime, manganese, and quartz. Nos. 14, 16, 24, also contained carbon. All of these were loose powders, except 24, which was compressed dry in a reed, and had not therefore become oxidised, but is still friable. Two samples were quantitatively analysed, yielding

		No. 18.	No. 24.
Galena	Pb S	91.13	85.16
Peroxide of iron	Fe <sub>2</sub> O <sub>3</sub>	3.40	6.77
Carbon	C	..	2.78
Sand	Si O <sub>2</sub>	4.72	4.93
Vegetable matter		.48	..
Manganese	Mn O <sub>2</sub>	..	trace
Calcite	Ca CO <sub>3</sub>	trace	trace
		<hr/>	<hr/>
		99.73	99.64

The oxide of iron and some other items were probably associated with the galena, but the carbon is perhaps intentional. The amount of iron points to

a native lead ore being used. No. 3 is probably of this class, as lead was found in the few grains available.

*I. B. Galena roasted*, XIIth dyn. Nos. 8, 31; XVIIIth, 28, 30, 32; XIXth, 20, 23, 25, 26; XXth, 1, 5; Coptic, 9, with molybdenum. In these the sulphide is partly changed by roasting, and by subsequent oxidation while moist. Both free lead, and free sulphur, are found; together with sulphide, sulphate, and sulphite, of lead. The chance impurities are oxides of iron and manganese, ochre, calcite, and chlorides of magnesium and potassium. In No. 5 oxide of copper may be accidentally introduced from another powder. Nos. 20 and 26 are not homogeneous, and are divided here into 20 a, b, c, and 26 a, b. The most interesting are the following:—

		No. 26a.	No. 26b.
Galena	Pb S	30·00 (or 32·00)	trace
Sulphate of lead	Pb SO <sub>4</sub>	53·10	86·22
Oxide of iron	Fe <sub>2</sub> O <sub>3</sub>	·38	·68
Carbon	C	3·12	..
Sand and quartz	Si O <sub>2</sub>	3·90	4·13
Chloride magnesium	Mg Cl	1·10	·87
Chloride sodium	Na Cl	2·95	..
Chloride potassium	K Cl	..	3·60
Sulphur free	S	1·75	1·33
Ochre		1·60	1·33
Vegetable matter		..	2·14
Lime and manganese	Ca Mn	traces	traces
		97·90	100·30

The presence of metallic lead, which abounds in other examples, along with the drossy pieces found in some specimens under the microscope, shew that the galena was roasted; the iron and ochre may come from accompanying silicates; the three chlorides may be intentionally added, as "sea salt," for species of natron are named in the Ebers papyrus eye-salves. The lime is a white crust, derived from the alabaster vessels which contained it. Another piece of 26 contained a good amount of metallic lead.

The principal ingredients of the following were determined.

		No. 8.	No. 23.	No. 25.	No. 28.
Galena	Pb S	39·43	23·81	29·75	..
Lead	Pb	..	8·09	..	57·
Sulphur	S	..	..	·11	2·35
Sulphate of lead	Pb SO <sub>4</sub>	43·23	37·81	38·70	..
Sulphuric acid	SO <sub>3</sub>	..	..	..	2·70
		82·66	69·71	68·56	62·05

The reduced lead in 23 and 28 results from rapid roasting. Nos. 1, 5 and 30 are similar; 5 contained chips of malachite, perhaps strayed. 20 b contained sulphate of lead and sulphuric acid, in all 59·76 of

lead. Nos. 31 and 32 are like 26. No. 9 is remarkable as containing sulphide of molybdenum, having lead 58·10, molybdenum 6·01, sulphuric acid 5·06, and sulphur (as hydro-sulphuric acid) 1·22, in 70·39 per cent. But this specimen is of Coptic date.

63. *II. Antimony*. In No. 21, of the XIXth dynasty, there is 32 per cent. of antimony, beside 35 per cent. of matrix and some per cent. of quartz, and other chance impurities such as are usually found in lead powders; but this is completely free from lead, and is antimonious sulphide Sb<sub>2</sub>S<sub>3</sub>.

*III. Ochre*. XIXth dynasty, 12, 13, 15, 20 a; XXth dyn. 4. These are more or less mixed with quartz and plant remains, and are strongly ferrous. They are from reeds, and also wrapped in dicotyledon leaves. The green specks in some are perhaps sulphate of iron, oxidised from the pyrites which occurs in clays.

*V. Manganese*. XIIth dynasty, 6; XVIIIth, 29; XIXth, 26c. In No. 6 is some oxide of copper, perhaps intended to darken the tint. In 29 is 20 per cent. of Mn O<sub>2</sub> along with other oxides of manganese, and small quantities of galena, oxide of iron, ochre and silica, so it is a powdered pyrolusite. In 26 c is some lead, perhaps from 26 a.

*V. Magnetite*. XIXth dyn. No. 19, contains silica 59·64, magnetite (Fe<sub>3</sub> O<sub>4</sub>) 26·93, carbon 11·83. Iron 1·49. It is black and strongly magnetic; probably reduced from oxide of iron (haematite?) by heating with charcoal, and mixed with sand and more charcoal.

*VI. Copper*. XIIth dyn.? No. 27, is oxide of copper, doubtless produced by roasting malachite. XIXth dynasty, Nos. 11 and 17 are malachite (carbonate of copper), with white chips—perhaps artificial glass—and grains of sand. Perhaps the carbonate is artificial, but as it is the only Egyptian ore of copper this is less likely. Fischer points to a note in Zippe that the green patina on some Egyptian bronze is mainly a basic chloride of copper, corresponding to Atacamite. But this is not usual.

64. Of the metals thus found the copper comes certainly from Sinai, where the mines were already worked by the Egyptians in the pyramid period; Fischer points this out in his introduction, which contains a sketch of what was hitherto known on oriental eye-paints. The iron, which is scarce in Egypt, must also have been imported, probably from Sinai, scarcely from Kordofan or India. Antimony and lead are distant products, not being found in Sinai or Arabia. *Mestem* is said in inscriptions to come from the

Arabian coast, but that only proves that the Egyptians received it thence, not that it originated there. Similarly in later times Arabia was named as the home of such products as the cinnamon, which was only conveyed by the Arabs. Thus the lead and antimony were brought by them from India; and probably also the tin which was needed for making the bronze, which starts with the New Kingdom in Egypt. The galena was substituted for the rarer antimony perhaps in Arabia; and the manganese, copper, and magnetite were Egyptian substitutes, either openly or fraudulently; for the true meaning of *mestem* is yet uncertain.

In any case the analyses of Dr. Fischer have taught us something more important than the philological meaning of a word; they have shewn us what materials the Egyptians actually used for eye-paints, and provided evidence as to the primitive relations of trade between Egypt and India. Even if this were but indirect, through the Arabs, yet in conjunction with the apparently Phoenician graves just discovered by Bent on the Bahrein islands in the Persian Gulf, this gives us an entirely fresh insight into the relations of the people of the further east, in a time far before the so-called Greek period.

[The above was kindly translated by Mr. Griffith, and I have with Dr. Wiedemann's sanction incorporated one or two details bearing on the matter. I may add as a personal suggestion that the green *uat'* which accompanies the *mestem* in early times is the green carbonate of copper, which was used around the eyes as we see on early sculptures, and as I found on the mummy of Ranefer. Also I believe that the source of Egyptian tin was from Bohemia, Saxony, and Silesia. That the civilization of Europe was in contact with Egypt before tin appears there, is now certain. That the European civilisation extended to the north is also known from the northern objects at Mykenae. And as tin (in bronze) is found as early, or earlier, in Europe than in Egypt, we must rather suppose that it went from Greece to Egypt, than that it came from the east and was immediately transmitted in large quantity across the Mediterranean to the north.

W. M. F. P.]

## CHAPTER VIII.

### EGYPTIAN COLOURS.

By W. J. RUSSELL, PH.D., F.R.S.

65. We shall consider here first the colours of purely Egyptian origin, as found in the town of Kahun (XII dyn.) and Gurob (XVIII-XIX dyn.); and then notice the examples of Roman age.

The *red* pigments are all natural products and consist essentially of ferric oxide. The mineral from which they are obtained is commonest at Kahun, and is known as oolitic haematite. Some of the specimens are the mineral in its natural condition; others, from Gurob, are apparently lumps of the same substance after being reduced to fine powder, and probably to some extent purified. A remarkable feature in all the natural specimens is that at least one side is perfectly smooth and curved; had it been a fusible substance the inference would have been that it had been melted and cast in a mould. However, when the surface is carefully examined it is found to be marked with fine lines. These smooth surfaces seemed at first difficult to account for, but I have now no doubt that they were produced by the ingenious way in which the pigment was prepared from the natural product. Instead of pounding or grinding the mineral they simply rubbed it in a curved vessel, or might be a hollow in a rock, with a little water; fine particles were thus abraded, and the water present gradually carried them down to the bottom of the vessel, from whence they could be easily removed. I have tried this way of preparing the pigment, and found it to answer admirably. I took one of the specimens with a curved smooth surface and rubbed it in a large porcelain mortar with a little water, and thus with the greatest ease obtained a wet powder which at once could be used, without addition of any other medium, as a pigment; for it adhered to paper, to wood, and to the fingers, with wonderful pertinacity, and alone it dried up to a powder very similar to some of the specimens found.

No doubt the specimens of haematite were carefully selected; they differ somewhat in texture, but very little in tint. One sample contained 79·11 % of ferric oxide, and another 81·34 %.

The *yellow* pigments are found at Gurob, and are also entirely derived from native minerals, iron ochres. They contain oxide of iron, which is again

the colouring constituent, in a hydrated condition and mixed with a certain amount of silica and alumina, and traces of other substances. The colour is very permanent, but varies considerably in different specimens. In some cases it is a light yellow, in others of a much warmer tint.

66. The *blue* pigments are mainly from Gurob, and those of Kahun are inferior: they are by far the most interesting ones, for they are artificial productions, and hence their existence may serve to indicate to some extent the manufacturing skill and knowledge of the producers. They vary greatly in tint; Mr. Petrie having found some of a light and tolerably pure blue, others of a strongly greenish blue, and some specimens of a very fine and slightly purplish blue. All the specimens are of the same character and are what are known as frits, that is a kind of unfused or rather semi-fused glass. The ingredients composing these frits are the same as those found in glass, but the heat to which they have been exposed is only sufficient to cause combination of the constituents to take place, but not sufficient to bring the whole mass into a liquid state.

Mr. Petrie was fortunate enough to find several large pieces of these frits; and in every case they had a smooth and curved surface, exactly similar to the curved and smooth surfaces of the haematite; and again I found that a powder which exactly corresponded to the blue pigment which was used, could with ease be obtained by rubbing the specimen in a large mortar with water. It is to be hoped that some of these vessels where this rubbing of the raw material took place in the preparation of these paints will before long be found.

As before mentioned, there is a great difference in the tint existing in the different specimens, and often the same specimen will have strangely different colours in different parts. Most of the specimens were of the well-known delicate greenish blue colour, a few were of a stronger green colour, and one small specimen was of a splendid rich blue tending towards red, I imagine much the same tint as the so-called Alexandrian purple. This specimen was wholly of this colour, while others had the colour only in part, and none I think were so brilliant in colour as this small piece.

That copper was the colouring-matter in these frits there could be but little doubt; the only question was with regard to the purple one just mentioned. Most of the blues produced by silicates of copper have a greenish tint, but this one was

quite free from it, and resembled exactly a frit easily produced by cobalt; but no trace of cobalt was present. There seemed so many points of interest with regard to the production of these different coloured frits, for instance how exactly they were made, what sort of furnace would be necessary, and how it happened that they were at that time, with their comparatively rude apparatus and imperfect knowledge, able to obtain so many different shades of colour,—that I was led to try to imitate exactly the specimens which Mr. Petrie had found. The purple was the most difficult to reproduce, but I have made it, and it is quite equal in colour to the original. The others were, after experience had been gained as to the general method to be employed, readily prepared; and there is no difficulty in considerably extending the number of colours which can readily be obtained by the same process. The colours are all very stable, they do not fade, and are not acted on by even strong acids.

With regard to the necessary appliances for making these frits, judging from the large size of some of the pieces found, we must conclude that considerable quantities of material were acted on at once; and it is certain that the materials to form the frit must have been raised not only to a red heat, but also have been maintained at that temperature for several consecutive hours.

Up to the present time I believe furnaces for accomplishing this have not been discovered. I can only express an ardent hope that before long we may learn in what form of furnace this making of the frit was conducted. The operation was not devoid of difficulty. The materials they used were silica, which was the principal constituent, and formed perhaps 60 to 80 % of the whole mixture; then there was the copper to give the colour, no doubt merely the crude mineral, but almost any salt of copper would produce the same effect. The other ingredients are alkali and lime. The amount of alkali is small; I used in my experiments 10 % of potassium and sodium carbonates. These ingredients have to be well mixed together; and then carefully heated in a crucible of some kind to protect them from the direct action of the gases given off by the burning wood, otherwise the frit would become more or less black. Again, a certain regulation of temperature would be required, for if the fire were not hot enough the necessary chemical changes would not take place, and on the other hand if the temperature became unduly high the materials



would fuse, and a hard glassy body would be formed ; such a body could not be reduced to powder by the rubbing as above described, and it is of much interest to note that every specimen of the frits that I have seen has been in the friable condition, and not in this glassy state ; this shews that they had not been exposed to a high temperature ; and also that only a small amount of alkali was used in their preparation. I have found no difficulty in preparing all the imitations of the frits in this friable state, so that on rubbing they can be readily reduced to powder. In certain cases a high temperature would also decompose the copper compounds, and give a more or less black instead of a blue frit. The colour of the frit depends principally, but not altogether, upon the amount of copper it contains. I found I could imitate a very delicate greenish blue frit with a mixture of 3 % to 5 % of copper carbonate : another, and deeper coloured, specimen was exactly imitated by a mixture containing 10 % of copper carbonate : and the imitation of the Egyptian purple was produced when 20 % of the copper salt was used, but the colour is much affected by the temperature at which the heating has been carried on, and also by the length of time of heating. Again, the amount of lime, and presence of small quantities of iron, also affect the colour to a great extent. No doubt the desert sand was used, and I am informed that at different places it can be obtained either white, and it is then free from iron, or deeply coloured, and it then contains much iron : at all events it is certain that a very small amount of iron modifies the colour to a very considerable extent. If the ordinary red sand was used, then there was always a greenish blue frit produced. The most common of the blue pigments are the ones most easily produced, and contain comparatively small amounts of copper, perhaps 3 to 10 % ; the ordinary brown sand was probably used in preparing them, and lime in some form was added. The copper compound thus produced very readily and quickly forms, and is not altered even if exposed to a high temperature, or a long continued heat. The green frits, the darker and purer blue ones and the purple ones are not formed quite so easily. The green ones may be produced by the presence of iron, the simplest way of preparing such as I have seen is simply by using a very red sand, and about the same amount of copper as gives the greenish blue frit ; but the green colour can also be produced by copper alone, but in this case the quantity must be larger than what is required to produce the light blue frits,

and a careful and not excessive heating is necessary. The green appears before the frit has come to its permanent colour, and on continued heating passes away. In some of Mr. Petrie's specimens there is a beautiful mixture of colours ; in a small area you find a brilliant blue colour and a delicate but strong green. I have often obtained exactly analogous results, and some of great beauty, in the frits I have made ; different copper compounds are formed, their formation arising from accidental differences of temperature or mixture. I have no doubt these effects in the Egyptian specimens are purely accidental, and are produced in mixture made with 10 % or more of copper carbonate. When the amount of copper is increased to 15 or 20 %, and about an equal amount of lime is present, then the purple frits can be formed, but this is a somewhat more delicate operation. The amount of copper present is so much larger that it takes much longer to convert it wholly into silicate, and the range of temperature at which it forms is more restricted than in the other cases, but there is no real difficulty in forming it. At the same time I doubt whether the Egyptians ever made this purple as a sole product, the only piece of frit which was entirely of this colour that Mr. Petrie has found was not so large as the first joint of a little finger, and the other pieces of that colour occur in larger specimens, and are simply local, the rest being of a darkish blue or blue green colour : in a word, its formation in these cases was certainly accidental. With modern appliances I have been much interested in carrying out still further this same process for preparing different coloured frits, and many are the tints in addition to those known to the Egyptians which have been produced. In fact every shade of colour from a pure and very delicate light blue to a very dark indigo blue can be made, and again from a pure blue every shade of green and blue to a strong green ; many of these green blues are remarkably forcible in colour and delicate in hue.

[I have since found part of a dish of frit at Tell Amarna, which had been broken and withdrawn from the furnace before complete combination. The pan was of rough pottery, shallow, about 9 inches across ; probably covered with a tile to keep off the reducing flame, as the edges are turned black. It was supported by the edges resting on cylindrical pots inverted in the furnace. The frit is of a lilac-blue. The uncombined silica is in large translucent splinters, from quartz pebbles, quite white. The mass was blown up while pasty, by about an equal volume



of gas, shewing that the lime and alkali were used as carbonates. I have also found many pieces of broken pottery with blue paint in them, suggesting that the frit and probably the haematite was ground in a concave potsherd.—W. M. F. P.]

67. We now proceed to the pigments of the Greco-Roman age, of which samples were found at Hawara. These are of interest, as such colours appear to have been used, mixed with wax, by the painters who produced the portraits discovered there; and they are probably similar to the colours used by the great Greek artists.

These pigments were obtained from six pots of paint found in a burial; the pots had been undisturbed and evidently were just in the same state, as when last used by the owner. In some of the pots but little of the paint remained, but in others a considerable amount. The marks of the brush with which the paint had been removed were still perfectly evident. Mr. Flinders Petrie gave me a small specimen of each of the six pigments; they are a dark red, a light red, a pink, a yellow, a blue, and a white. The specimens being so nearly in the condition in which they had undoubtedly been used as paints, gave them a special interest.

*The Dark Red Pigment.*—It has precisely the colour of the burnt sienna of the present day, and is identical with it, consisting of ferric oxide. Like the modern burnt sienna it does not dissolve completely in hydrochloric acid, and like it, leaves undissolved flocculent mineral matter and a little silica. No doubt it was prepared from natural iron ochre by heating, and afterwards grinding it; similar operations to those carried on at the present day for preparing this pigment, and in fact this Egyptian colour is indistinguishable from a sample of burnt sienna purchased at the present time.

*Light Red Pigment.*—This is an oxide of lead, and is known as red lead or minium. It is prepared by heating in the air, to a temperature of dull redness, lead, oxide of lead, or lead carbonate. It is somewhat paler in colour than the ordinary red lead of the present day, but it has some dust and sand mixed with it.

*Yellow Pigment.*—This is an iron ochre of a light yellow colour. On heating it darkens and becomes of a dull red colour. The dark red pigment, already described, was probably made from this mineral by heating it. This specimen of the yellow pigment has apparently been mixed with some oil or wax, no doubt as a medium, for on heating it white

fumes, such as come from organic matter are given off.

*The White Pigment* consists of calcium sulphate or gypsum. It is very tenacious, but is easily cut or scraped with a knife. It has apparently been ground and carefully prepared for use, and in its present state would work smoothly and well; and as a pigment it could be used for many purposes simply on mixing with water.

*Pink Pigment.*—This is a most interesting pigment belonging to a different class of bodies from all the others; they are mineral compounds, whereas this pink colour is due to an organic substance. The fact that, even under favourable conditions, an organic pigment should have existed for this length of time is of interest; and I think there is good reason to suppose that it has not only existed, but has undergone little or no change of tint during this long period. On heating this pigment the colour is immediately destroyed, a slight empyreumatic odour is given off, and a white mass remains, apparently equal in quantity to the original substance. This residue is calcium sulphate, the same substance as the white pigment. The colour is therefore due to a very small amount of an organic body which coloured the gypsum, an amount too small to be recognised by chemical analysis. I therefore endeavoured synthetically to determine the nature of the colouring matter which gave to the calcium sulphate its peculiar tint, Madder as a vegetable colouring matter which has been known from the earliest time, naturally suggested itself; and with some madder root I was able to prepare a pigment which agreed in tint and in all its properties with the Egyptian one. It is readily prepared in this simple way; madder is boiled with water; the liquid cooled and strained; and this strongly coloured liquid well stirred up with calcium sulphate. The colouring matter adheres strongly to the gypsum, and if it be allowed to dry, and is then powdered, a substance is obtained of the same colour as the Egyptian pink, the shade of colour depending simply on the strength of the madder solution. Although ordinary chemical analysis could not identify the colouring matter in this case, it seemed to me highly probable that I could confirm this view of the nature of the colouring matter by means of spectrum analysis, for it is well established that the colouring matters derived from madder root are characterised by very definite absorption spectra. As this Egyptian colouring matter appeared to be so little changed, it was quite possible that even the small amounts which I

had at my disposal might yield at least the marked and well-defined absorption spectrum of purpurine. I first tried the experiment with some of my imitation pink pigment; it gave on boiling it with alum solution very marked absorption bands which I proved, by comparing them with a purpurine solution, to belong to that body; and on treating the Egyptian pigment exactly as I had treated my imitation of it, it was satisfactory to find similar absorption bands, which leaves no doubt as to the nature of this colour, and shews how little the colouring matter has changed in the many centuries of its existence.

The remaining colour is a blue pigment. It is a frit, or unfused glass, finely ground. The colour it possesses is owing to the presence of copper, like the frits previously described. It is a remarkably stable compound, being practically unattacked even by strong acids, and unchangeable by the action of light.

## CHAPTER IX.

### COPTIC PAPYRI.

By W. E. CRUM.

68. The Coptic MSS. which Mr. Petrie brought, 3 years ago, from the Fayyum, form a collection very similar to those in Berlin and Vienna, though less extensive than either of these. They have in common the same curious anomalies in regard to dialect and the same, as yet insurmountable, difficulties of interpretation. As with all Coptic literature, their monastic origin is evident. Yet even the hypothesis of monasteries with extensive circles of correspondents, seems hardly a satisfactory explanation of the extraordinary dialectal variety discernible in so comparatively small a body of texts. Of the six recognised dialects, four—perhaps five,—are represented, not to mention the several intermediate, local forms which some of the fragments exemplify. One can not but incline to Erman's opinion (*Hermes*, XXI,) that supply and demand of modern commerce have been the main cause of the accumulation in the Fayyum of documents which had their origin in widely different provinces.

The only attempt made as yet to deal with the Coptic "Fayyum" Papyri is that of Stern (*Aeg. Zeitschr.* '85); for Krall (*Mitth. a. d. Sammlg. Erzsh. Rainer, passim*), has confined himself to some of the more frequent formulæ, place-names &c. But little light has since been thrown either upon the vocabulary

or grammatical forms, which still seem as foreign to those of the "classical" dialects as they 6 years ago appeared.

The material upon which our texts are written is either Papyrus, Parchment or Rag-paper; the first appearing, for all purposes, in a great majority, the second used, (with one exception,) for purposes not merely ephemeral, and the third exemplified only by one or two epistolary fragments of late date. Some of the Papyri are palimpsests; while a number bear two distinct texts, one upon each face. In one instance, half a sheet, of which one side had remained clear, has been employed by a second letter-writer, who ends with the postscript; "Blame us not because I (*sic*) have not been able to find a clean papyrus, worthy of your Honour."

Chronologically the Collection covers probably a considerable period, although not a single date can be cited or inferred. There may be palæographical reasons for placing one of the parchments not later than the 6th century; otherwise the texts would seem to range from the 8th to the 10th centuries; the frequency of the Arabic fragments forbidding an earlier, the rarity of paper a much later boundary.

The following are the Dialects met with in the Collection, in the order of their frequency:—1. Fayyumic; 2. Lower-Sahidic, probably from Memphis and its neighbourhood; 3. Sahidic; 4. Boheiric, with its characteristic guttural letter, which seems not to occur in the Vienna (*v. Mittheilungen II*, 57,) or Berlin texts; 5. Achmimic.\* The presence of the fourth only of these can be doubtful, in so far as the two texts in which the characteristic letter occurs, do not exemplify the dialect in its pure form, but bear clear traces of a more southern influence.

69. The documents may be classified, on the basis of subject-matter, as follows:—

A. *Biblical fragments.* One example only, being at the same time the sole instance of the Achmim dialect. A small leaf of thin parchment ( $4 \times 3\frac{1}{2}$  in.), paged  $\omega\text{I}\text{H}$  and  $\omega\text{I}\Theta$ , bears vv. 17–20 of the Epistle of Jude; while the quarter of a similar leaf has the Epistle of James, iv. 12, 13. These are the only traces, as yet recognised, of the Achmimic New Testament. The text is in single column, and written in so archaic a character,—the 4th plate (de la Zouche) of Hyvernat's "*Album*" may be compared,—that the 6th century would not seem too early a

\* Dr. Steindorff points out that the Graffiti (*Recueil xi*, 145) at Achmim are the best confirmation of the accepted "provenance" of this dialect.

date for these valuable fragments. When compared with the Sahidic and Boheiric versions, our text is seen to stand in close relation to the first, while the second comes, of all, the nearest to the Greek.

B. *Other theological texts.* Part of a parchment leaf has preserved two columns of what appears to be a homily (somewhat in the manner of Jesus Sirach,) upon the domestic virtues of women, and the futility of hoping to atone for their loss by the display of other qualities, if once the husband have ground for mistrust. The dialect is pure Sahidic, and the character an Uncial not unlike that of F. Rossi, *Tre Manoscritti, tav. II.* Upon a fragment of Papyrus, of late date, can be recognised the remnants of the story of Athanasius and Arsenius, bishop of Hypsele, whose hand the former was accused of cutting off and using for magic purposes. The groundlessness of the charge was proved at the Synod of Tyre. (See Hefele, *Conciliengeschichte*, I. 458, 464. I have to thank Prof. Harnack for this identification.)

70. C. *Letters.* This section embraces so large a majority of the fragments, that the remaining texts may be looked upon merely as exceptions. Unfortunately there are but few of the letters which approach completeness in preservation, and none which do not present great difficulties to the translator. They are for the most part in the Fayyum dialect, and, of course, in a character much more cursive than that of the texts described above. Ligatures are nevertheless not so frequent as in Sahidic MSS.; many of the fragments are wholly free from them. In one instance a Papyrus letter, of not more than ordinary importance, is written in a very fine uncial script, the same being the case with the only letter in the collection upon parchment.

The correspondence is wholly monastic; individuals being rarely mentioned without the title Monk, Brother, Deacon, Apa, or Presbyter. Other ecclesiastical dignitaries, such as Bishop, Archimandrite, Hegemon, also occur. Yet there does not appear to be any monastery named which might help to localise the writers; while but few of the place-names which do occur, can, as yet, be identified. Almost all the letters begin with a formula of greeting; "In God's Name! (var. With God!) First of all I greet and enquire for (var. embrace) the health of thy God-loving Fatherhood (var. Brotherhood, Sonship,) and thy whole company (or, all the Orthodox). Further, I inform thee, &c." In some cases this is more elaborate and mentions by name the various inmates of the cloister whither

the letter is directed, adding in a Postscript, such as may have been overlooked. The matters dealt with appear to be chiefly commercial or financial affairs in which the writer or his monastery are concerned. They are often dispatched very summarily, a single short letter referring to half a dozen points, each with its introductory  $\lambda\iota\pi\omicron\upsilon\iota$  ( $\lambda\iota\pi\omicron\upsilon\iota$ ).

The following may serve as a specimen of the style and form usually adopted by the correspondents. Great uncertainty as to the meaning of several words, added to the incompleteness of the text, make a fuller translation very difficult.

"With God! I greet and embrace the well-being of my god-loving, reverend Lord Brother . . . and I greet the whole company, that is to say, the Elders. Repose thy saintly Spirit in the Lord Jesus Christ, . . . from God. And now (lit. Thereafter) my Lord Brother, behold, (here is) the Deacon, Apa Cyrus, (and) I have sent thee the —? (cargos? or salt?), namely those with which thou art used to favour me. Send the Deacon, Apa Cyrus that he may lay them before Apa Jacob, till the Deacon Pisyntius comes and takes them . . . An answer, if thou desire it afterwards, . . . I greet my Lord Brother fairly, ( $\kappa\alpha\lambda\omicron\varsigma$  *sic*.) according to God's will. Farewell in the Lord!"

71. D. *Accounts, Lists, &c.* Though few in number, the examples of this class are of considerable interest. The most remarkable is a large fragment which bears, in double column on both faces, the names of workmen and others and the sums paid them during the "Inundation" and summer months. Among them appear Gardeners, Agricultural labourers, Shepherds, Camelherds, Bakers, Carpenters, Potters, Smiths, Washermen, Messengers, Watchmen. Several persons receive payment, although the services rendered are not stated. Some of those employed are monks; "the Deacon Georgios, the Carpenter," "Apa Petros, the Gardener." Several bear, moreover, the names of their villages, and from these we see that the monastery was not confined, for the supply of its needs, to the immediate neighbourhood, since the localities identifiable range from Lake Moeris to the Bahr Yusuf. This document has striking similarity with a Papyrus in Oxford, brought from Sohag, but probably originating, (as its place-names and dialect indicate,) in the Fayyum.

Another Papyrus, in a very fragmentary condition, seems to bear monastic accounts in which the measure of value is throughout  $\kappa\omicron\tau\tau\iota$ , the identifica-

tion of which with the Greek measure of capacity *κοῦρι*, *κόρος*, *χόρ*, I owe to Professor Wilcken, who adds that it is frequently to be met with in Greek MSS., especially in connection with wine. Although the latter repeatedly occurs in our Papyri, as an article of commerce, there is, in the present text, no trace of it, *κεραμεία* (*κεραμεία*) and *βιττινά* (?) being the only words, still legible, to which the figures might be supposed to refer.

Upon another fragment the Catalogue (*λογος*) of a monastic library is partially preserved. It has included the canonical books of the New Testament, in several copies and in Greek as well as Coptic; the Psalter, also in both languages, besides theological works such as "The Rules of Apa Petros," both Coptic and Greek "Mystica," works (?) of Syrianus, as well as "Reading Books" (presumably *κατὰ μέρος*, lectionaries). Some of the books are of Parchment (*αεγραφι sic*), others of Papyrus (*χαρτης*). Others are followed by the epithets *πετάλοι* or *ατπετάλοι*, the exact meaning of which it is difficult to determine. Prof. Wilcken suggests that they perhaps serve to distinguish Books consisting of *leaves* and Rolls of papyrus.

Of the Proper names which occur, little need be said; they are those which we are used to find borne by the Copts, e.g. *Οσεναβερ* (*Ὀσνωφρις*), *Πιστητι* (*Πεσίνθιος*), *Βικτωρ* (*Victor*), *Χαηλ* (*[Με]χαήλ*), *Ψαρκος*; less common are *Ψοσθαρι*,\* *Ηιλαμμεω*, *Φωρε*. The Place-names, on the other hand, are of interest, and, in some cases, recognisable still in their Arabic forms. *Arsinoe*, under its Greek form, does not appear. It seems, in one instance, to be represented by *πιμμε*, the name which otherwise designates rather the district than its capital (but v. Quatremère, *Méms.* I, 391). Elsewhere the same town is referred to merely as *πολις*, "the City." *Ellahun*—*λεζωνι* is met with several times. Among the less important localities one need scarcely hesitate to identify *Τοστων* with the modern *تطون* (*Schweinfurth*, "Tutûn"). *Ποσδεια* may be compared with *بويط* (*de Sacy*, *Abdallatif*, p. 685, note), *Ψηηαρω* with *سينرو* (ll. 683).

\* Here masc., but see Wilcken, *Sitzungsber. d. Berl. Akad.*, 1883, 904.

*κερκεσοτχος* is already known from Greek sources (v. *Aeg. Zeitsch.* '83, 162). Further, the names *τανψει*, *πελδισωκ*, *παβετ* ("the Wall"), recur sufficiently often, either in this collection, in Berlin or in Oxford, to establish their existence, although their identification be not easy.

[NOTE.—Mr. Petrie gives the following details as to the above localities. "Tutûn is 10 m. S.W. of El Medinet; Bawit is 7 m. W. of Derut (27° 39'), and has large Coptic ruins; Tansâ is 18 m. S.E. of El Medinet." The last may represent our *Τανψει*. *Sênru* should not be confounded with *Senûres*, lying some 8 m. to its N.E. All the MSS. come from El Hamâm near Ellahun.]

---

#### POSTSCRIPT TO CHAP. III. p. 27.

I AM desirous of making a correction to § 45 consequent on a more careful and extended examination of the inlaid colours than time allowed before Mr. Petrie left England. I found the globular grains of gum in all the specimens but the white. The gum being insoluble in water, was probably pounded, mixed with the paste, and heated to boiling point in the endeavour to dissolve it; but no more could thus be accomplished than to bring it to the half melted globular form. The gum comes nearest to Mastick by tests, and especially imitative preparations. It was doubtless new at the time of using, but changed very much since, as it will no longer soften in boiling water, as it must once have done. It is probable that it was used instead of gum arabic, or ignorantly mixed with it. Some of the pieces of colour, which had not been examined, were very hard. These yielded an animal matter, which answered completely to gelatine, precisely as the extract does from some of the bones from tombs of the same age. I therefore conclude that the gum used having been found incapable in places of retaining the pastes, gelatine or size in some form was applied to the surface of the paste, which it penetrated to varying depths, thus overcoming the difficulty in part. The whole process was evidently experimental.

F. C. J. SPURRELL.

## INDEX.

---

	PAGE		PAGE		PAGE
Aboriginal burials . . . . .	20, 21	Crum, W. E., on papyri . . . . .	48	Gladstone, Dr., analyses by . . . . .	36
Alabaster vessels . . . . .	18, 20	Cubit at mastaba . . . . .	13	Glaze, early . . . . .	34
Amenhotep III graffiti . . . . .	41	„ in pyramid . . . . .	6	Graffiti . . . . .	9, 40
Analyses of copper . . . . .	36	„ sign of . . . . .	32	Griffith, F. Ll., on inscriptions . . . . .	37
„ kohl . . . . .	42, &c.	Cylinder seal . . . . .	33	Grooves on pyramid face . . . . .	10
Animals in sculptures . . . . .	37, 38	Destructions in modern times,		Hawks in temple . . . . .	9, 34
<i>Ankh</i> , origin of . . . . .	33	1, 4, 15, 16, 17, 18, 22, 23,		Heknen, mastaba . . . . .	20, 38
Antimony, eye paint . . . . .	43	24, 25, 26, 27, 28, 34		Hieroglyphs, origins of . . . . .	30, &c.
Arch in Rahotep's tomb . . . . .	16	Dialects of Coptic . . . . .	48	<i>Hotep</i> , origin of . . . . .	33
Architecture of third dynasty	30, 31	Draught-board sign . . . . .	33	Inlayed colouring of Nefer-	
Atet, sculptures of (see Nefer-		Drawing the sculptures . . . . .	23	mat . . . . .	24
mat) . . . . .	26, 39	Dressing of stone . . . . .	27	Jars, sealed . . . . .	24
Blocking of mastaba cham-		Endowment of tombs . . . . .	37	Kohl . . . . .	41, &c.
bers . . . . .	15, 16	Excavations of Mariette . . . . .	16, 18	Letters, Coptic . . . . .	48
Blue paint . . . . .	18, 29, 45	„ in mastabas . . . . .	13, 14,	Levels of pyramid . . . . .	7
Bones of animals in mastabas	17	17, 18		„ at mastaba . . . . .	12
Brickwork removed intention-		„ need of scientific . . . . .	1	Libyan archer . . . . .	29
ally . . . . .	19	„ difficult at temple . . . . .	3	Madder pink, Roman . . . . .	47
Bronze, analysis of . . . . .	36	Eye paint . . . . .	41, &c.	Magnetite eye paint . . . . .	43
Bunefer, stele of . . . . .	37	False pits in mastabas . . . . .	17, 18	Manganese eye paint . . . . .	43
Burials, mode of . . . . .	20, 21	Farm servants, sculptured . . . . .	24, 38	Marks on pottery . . . . .	35
Cartouche, origin of . . . . .	33	Fayum papyri . . . . .	48	Masonry, dressing of . . . . .	27
Causeway . . . . .	9	„ places in . . . . .	50	Mastaba, system of, 5, 12, 14, 15, 19	
Chancellor, sign for . . . . .	32	Fishers . . . . .	23, 24, 38	„ angles of . . . . .	5, 15, 18
Character of Egyptians . . . . .	1	„ drying fish . . . . .	23	„ massive building of . . . . .	14
Chessylite . . . . .	18	Flints buried in mastaba . . . . .	18, 34	„ plundered anciently . . . . .	17
Colours inlayed . . . . .	24, 50	„ teeth of sickle . . . . .	31	„ sculptures of . . . . .	23, &c.
„ nature of . . . . .	28, 44, 50	Foundations, laying out . . . . .	12, 37	„ of aboriginal race . . . . .	20, 21
„ Roman . . . . .	47	Frescoes . . . . .	15, 19, 27	„ earliest . . . . .	11
Columns, forms of . . . . .	30, 31	„ nature of . . . . .	28	„ of Heknen . . . . .	20, 25, 38
Contracted burials . . . . .	21	Frit colours . . . . .	45	„ of Nefermat . . . . .	14, 39
Copper analyses . . . . .	36	„ unknown at Me-		„ of Rahotep . . . . .	15, 23, 37
„ carbonate . . . . .	18, 29, 43, 44, 46	dum . . . . .	29	„ „ annex . . . . .	17
„ eye paint . . . . .	43	Furniture of tomb . . . . .	38	„ of Ranefer ? . . . . .	17, 24, 38
„ tools . . . . .	16, 34	Galena eye paint . . . . .	42	„ „ fictitious . . . . .	24
Coptic papyri . . . . .	48	Gizeh great pyramid . . . . .	6		
Copying tombs . . . . .	2, 22				

	PAGE		PAGE		PAGE
Medum, name of . . . . .	39	Pyramid, inner coats of . . . . .	6	Tahutmes III graffiti . . . . .	40, 41
Meresankh, queen . . . . .	40, 41	"    levels of . . . . .	7	<i>Tat</i> sign, origin of . . . . .	31
Mestem eye paint . . . . .	41, &c.	"    causeway . . . . .	9	Temple, search for . . . . .	3
Mosaic decoration, so called . . . . .	24	"    passages . . . . .	10	"    entered . . . . .	4
Moving blocks, machine for . . . . .	35	Races, two in Egypt . . . . .	20, 21	"    position . . . . .	8
Mummifying, early . . . . .	17	Rahotep mastaba . . . . .	15, 23, 37	"    court . . . . .	8
Mutilations of bodies . . . . .	21	Ranefer? mastaba . . . . .	17, 24, 38	"    dimensions . . . . .	8
<i>Nefer</i> sign, origin of . . . . .	30	Rope cartouche . . . . .	33	"    courses . . . . .	9
Nefermat's decoration . . . . .	24	"    numerals . . . . .	33	"    graffiti . . . . .	9
"    mastaba . . . . .	14, 25, 39	"    signs . . . . .	33	"    objects in . . . . .	9, 34, 40
Nefert, chamber of (see Ra- hotep) . . . . .	24	Russell, Dr., on colours . . . . .	44, &c.	Third dynasty, civilization of . . . . .	30, &c.
<i>Nub</i> sign . . . . .	33	Sculptures . . . . .	23, &c.	Tin in bronze . . . . .	36
Offerings at pyramid . . . . .	19, 35	Seal, cylinder . . . . .	33	"    source of . . . . .	44
Origins of hieroglyphics . . . . .	30, &c.	Sealing of offering jars . . . . .	24	Tombs, see <i>Mastabas</i> .	
Overlapping roofs . . . . .	11, 20	Secondary burials . . . . .	19	Tools, analyses . . . . .	36
Peribolus of pyramid . . . . .	7	Sickle with flint teeth . . . . .	31	"    copper . . . . .	16, 34
"    building within . . . . .	10	Siga board . . . . .	7	"    in hieroglyphs . . . . .	32
Pottery . . . . .	20, 35	Skeletons mutilated . . . . .	21	Trade, evidences of . . . . .	44
Pyramid, excavations at . . . . .	3	"    preserved . . . . .	20, 22	<i>Uat'</i> paint . . . . .	41, 42, 44
"    casing discovered . . . . .	3, 4	Sneferu, evidence of . . . . .	10	Water, colour of . . . . .	30
"    now a quarry . . . . .	4	"    name found . . . . .	4, 26, 40	Weapons . . . . .	31
"    inside cleared . . . . .	4	"    queen of . . . . .	41	Wells of tombs, secondary . . . . .	19
"    construction . . . . .	5	Sneferu-khati . . . . .	9, 34, 40	Wiedemann, Dr., on kohl . . . . .	41, &c.
"    destruction of . . . . .	4, 5	Spoilers attacked tombs . . . . .	2	Wood used in construction . . . . .	16
"    size of . . . . .	6	Spurrell, F. C. J., on colours . . . . .	28	Working lines of mastaba . . . . .	12
"    angles of . . . . .	6	Stone face, scraping of . . . . .	27	"    of stone . . . . .	27
"    theory of . . . . .	6	Survey of mastaba . . . . .	13	Workmen . . . . .	1
		"    pyramid . . . . .	5		
		<i>Suten rekh</i> , meaning of . . . . .	37		

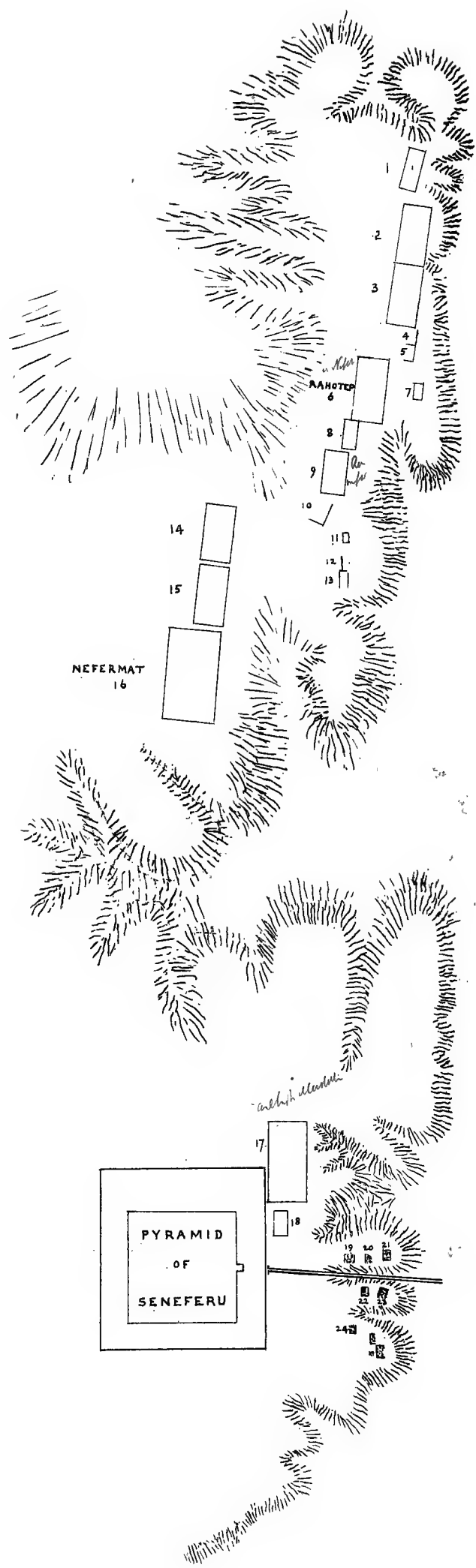
## WORKS BY MR. FLINDERS PETRIE.

---

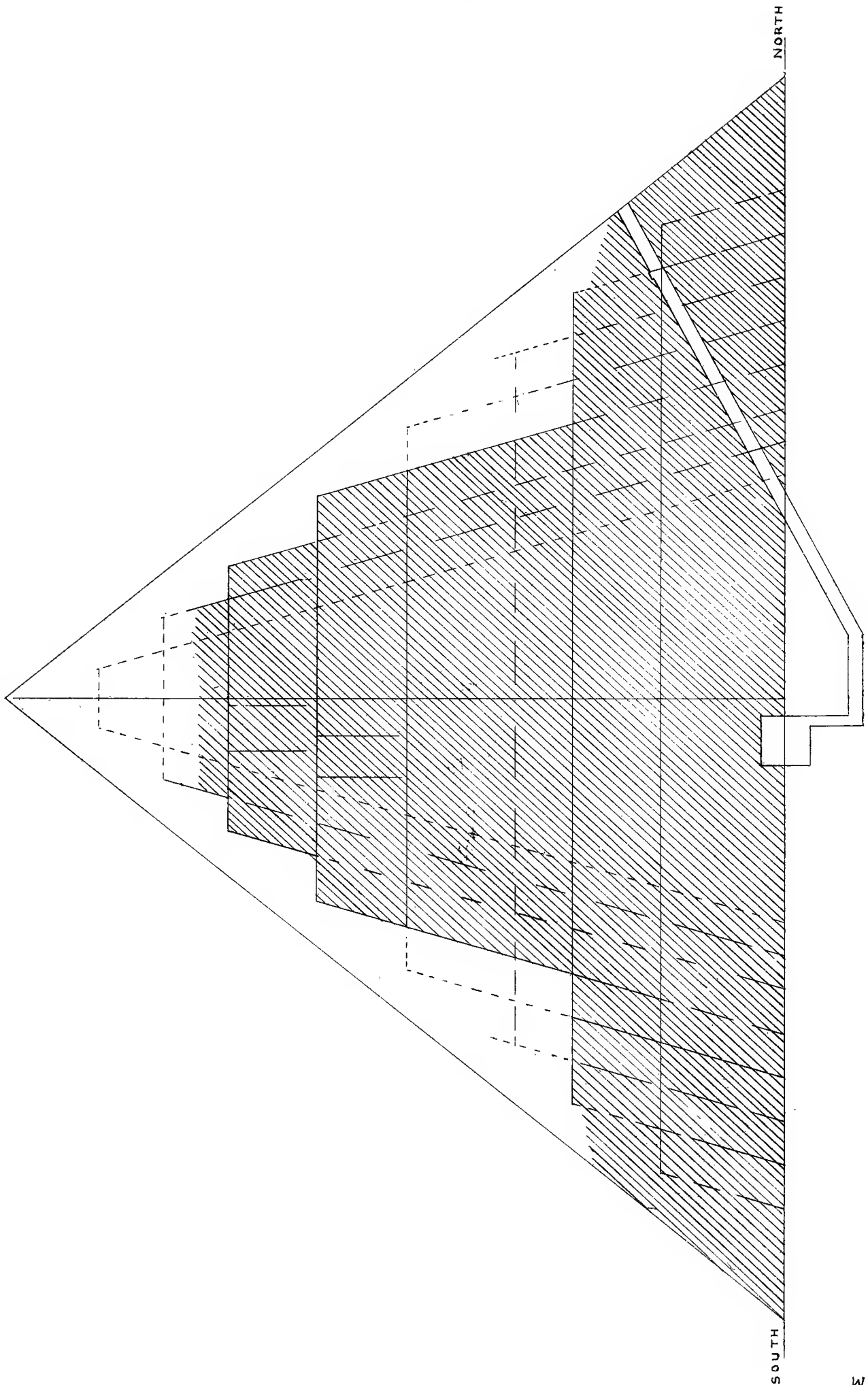
- Inductive Metrology. 8s. 6d. *Stanford.*
- Stonehenge : Plans, Descriptions, and Theories. 3s. 6d.  
*Stanford.*
- The Pyramids and Temples of Gizeh. Cheap Edition.  
8 plates. 6s. *The Leadenhall Press.*
- Tanis, Part I. 19 plates. 25s. *Kegan Paul & Co.*
- Tanis, Part II. ; Nebesheh and Defenneh (Tahpanhes).  
64 plates. 25s. *Kegan Paul & Co.*
- Naukratis, Part I. 45 plates. 25s. *Kegan Paul  
& Co.*
- Hieroglyphic Papyrus from Tanis. 15 plates. 5s.  
*Kegan Paul & Co.*
- A Season in Egypt, 1887. 32 plates. 12s. *The  
Leadenhall Press.*
- Racial Portraits. 190 photographs from Egyptian  
monuments. 45s. *Harman, High Street, Bromley,  
Kent.*
- Historical Scarabs, Drawings of 2,220. 68 plates. 8s.  
*Nutt.*
- Hawara Biahmu and Arsinoe. 30 plates. (Out of  
print)
- Kahun, Gurob, and Hawara. 28 plates. 16s. *Kegan  
Paul & Co.*
- Illahun, Kahun, and Gurob. 33 plates. 16s. *Nutt.*
- Tell el Hesy (Lachish). 10 plates. 10s. 6d. *Alex-  
ander Watt.*
- Ten Years' Digging in Egypt, 1881-1891. A popular  
summary. 118 illustrations. 6s. *Religious Tract  
Society.*





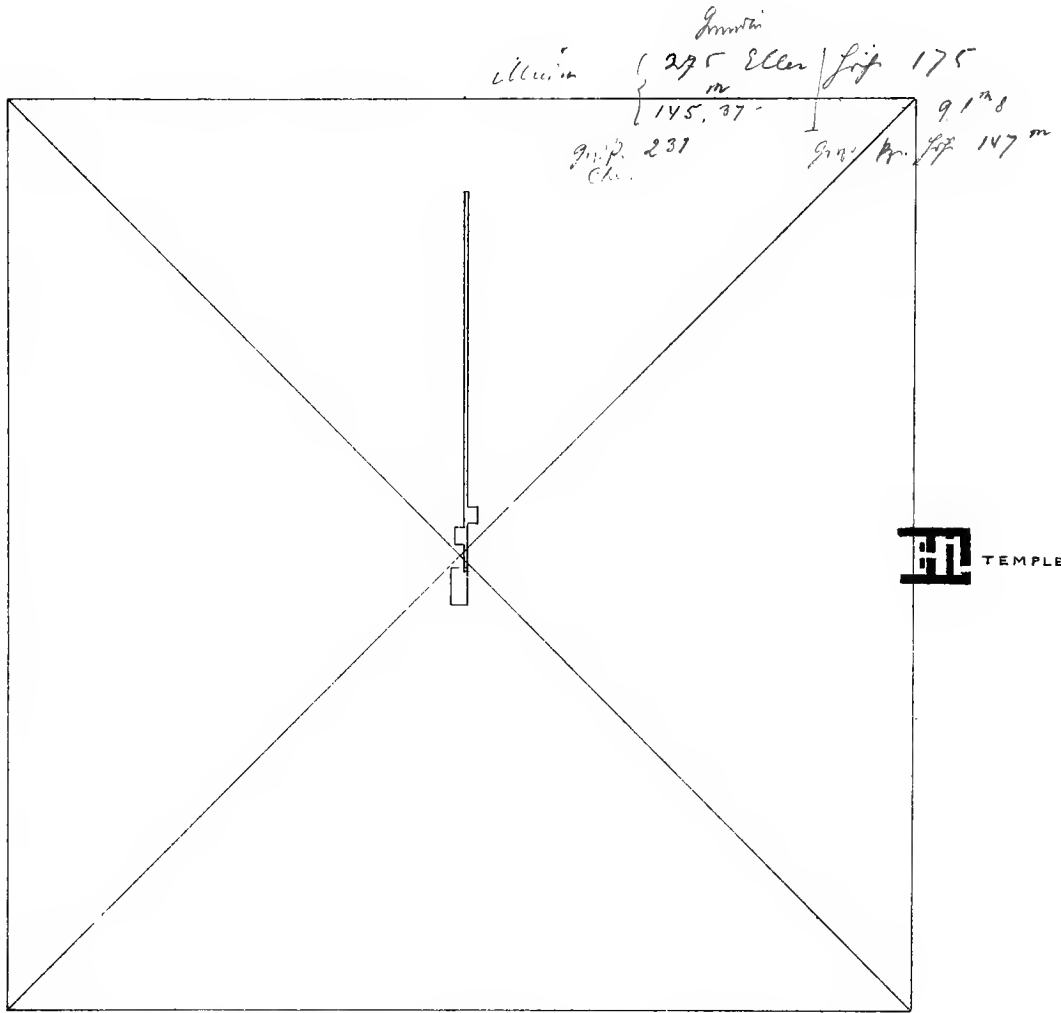








PERIBOLUS.



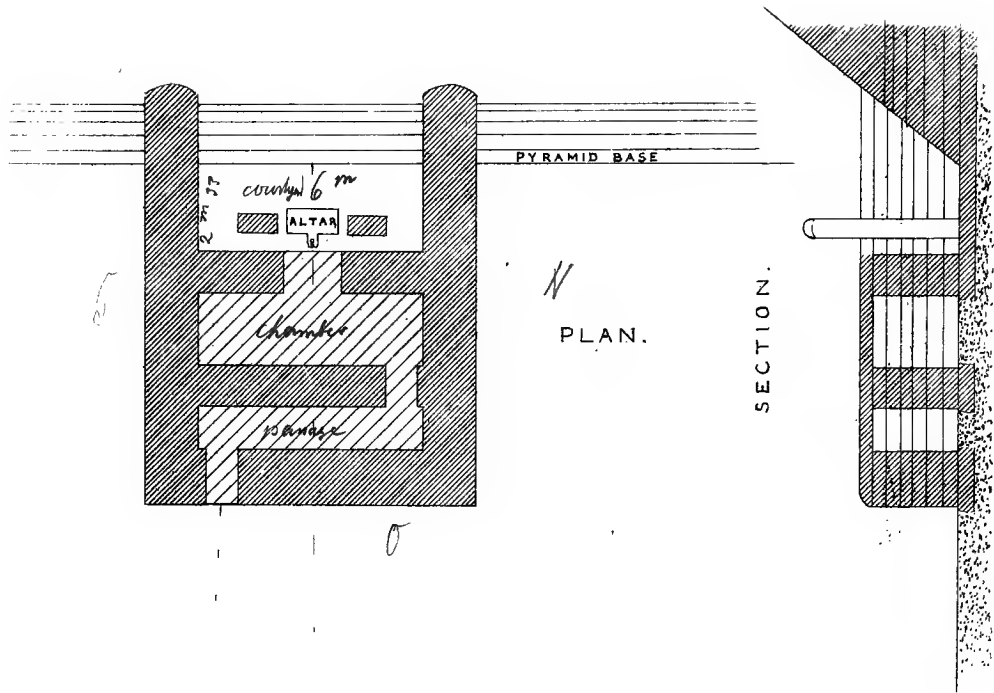
11



1:200

MEDUM TEMPLE.

IV



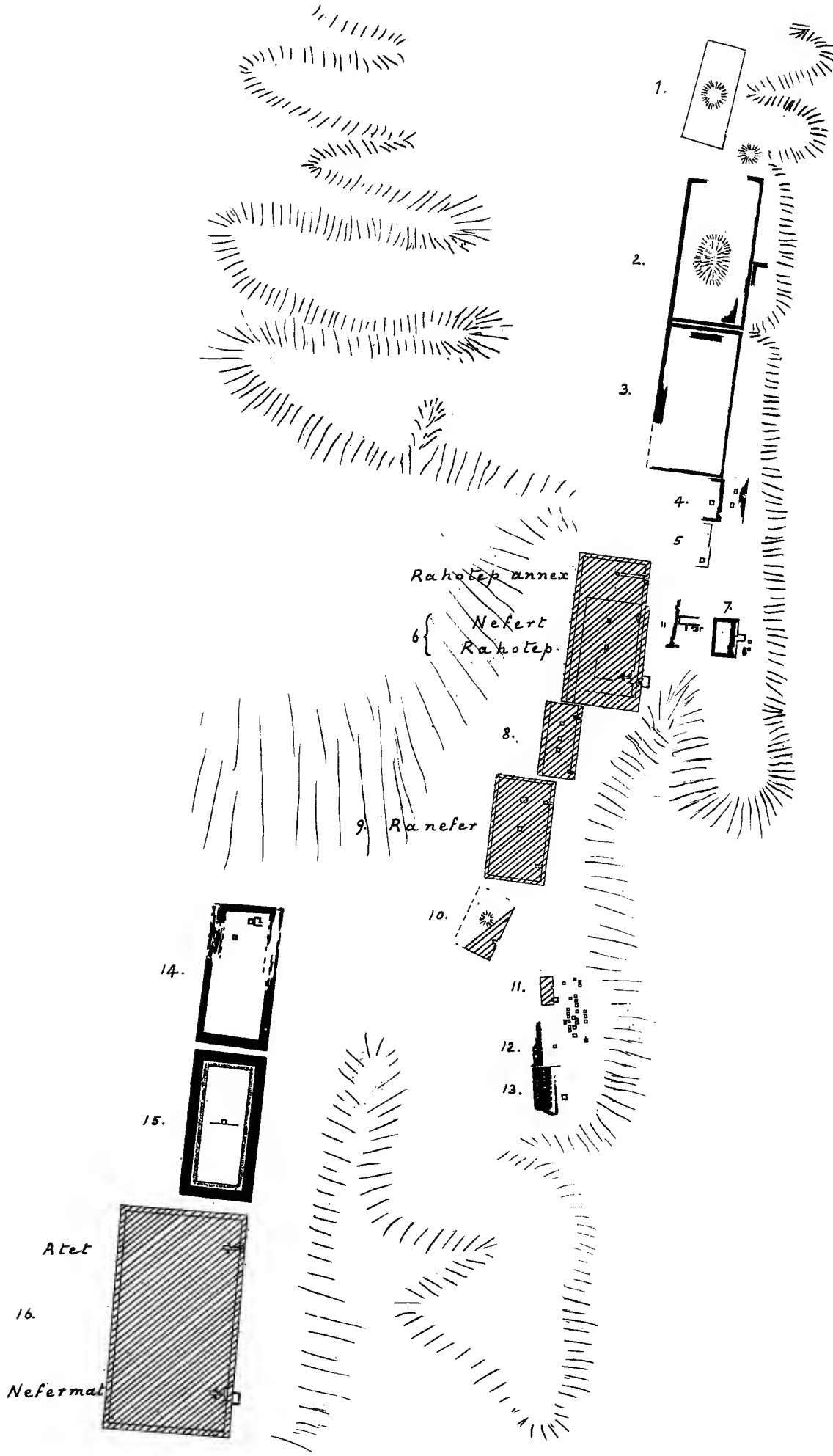
PLAN.

SECTION.

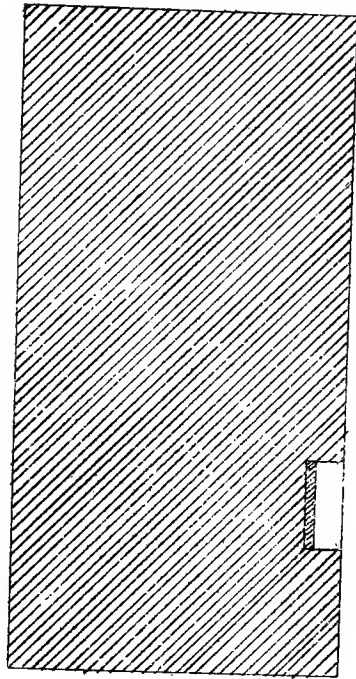
WALL OF PERIBOLUS



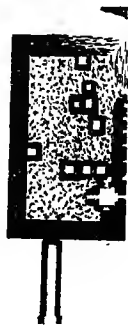
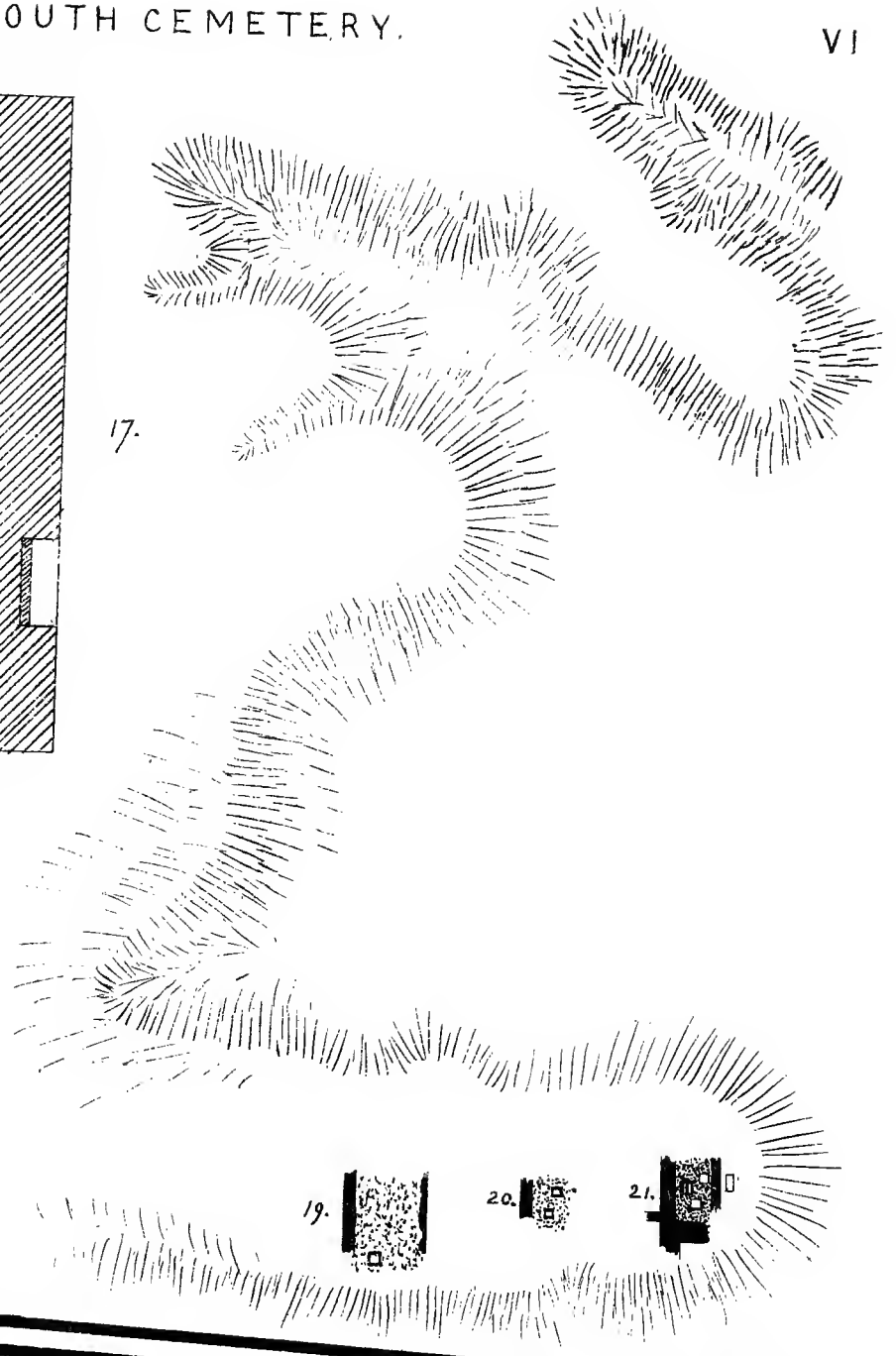








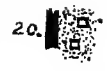
17.



18.



19.



20.

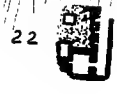


21.

 Temple.



Causeway



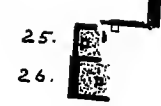
22.



23.



24.

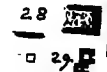


25.

26.



27.

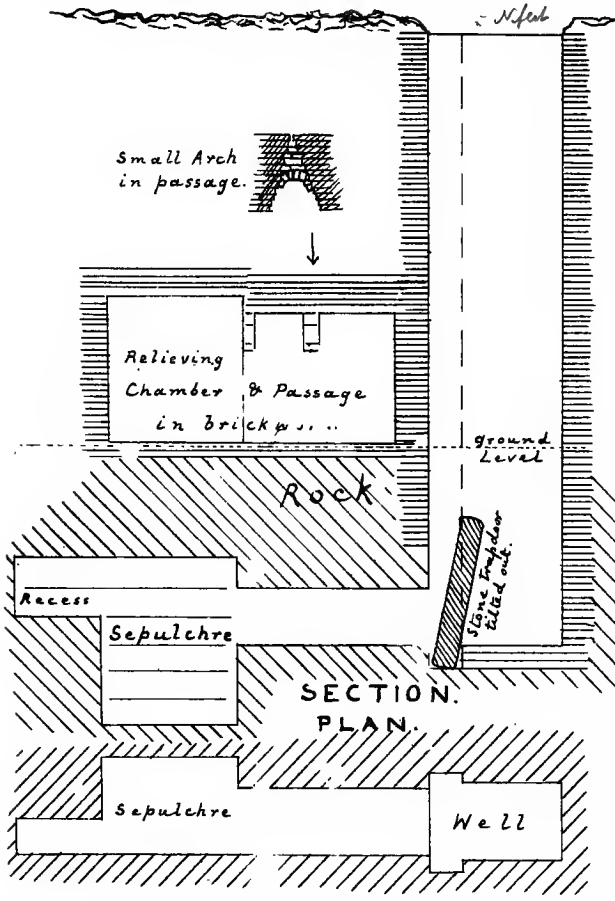


28.

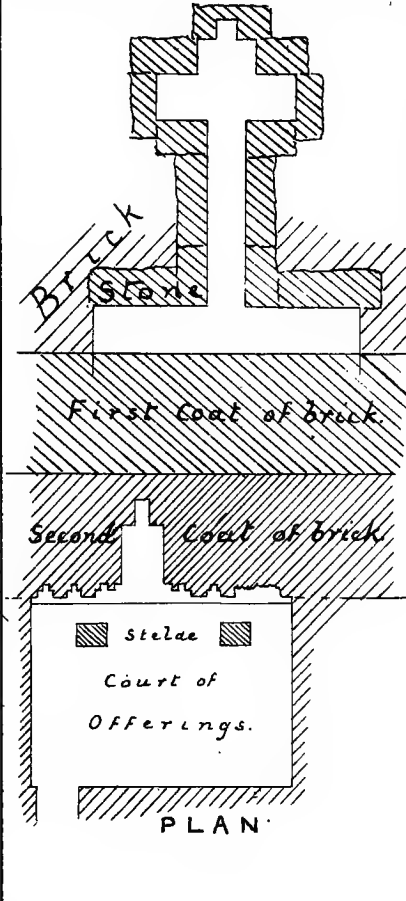
W.M.F.P.



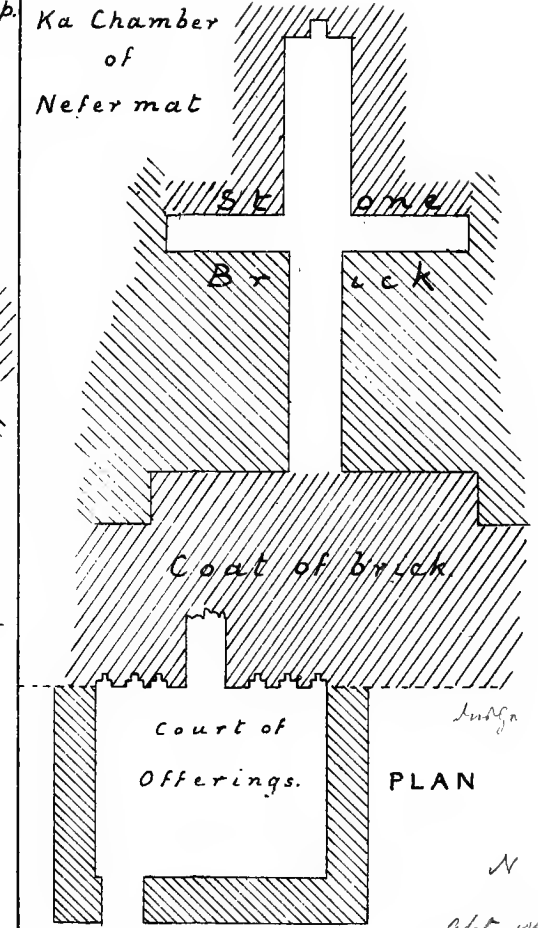
Sepulchral Pit of Rahotep.



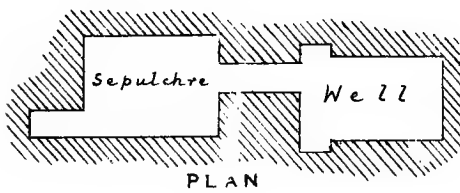
Ka Chamber of Rahotep.



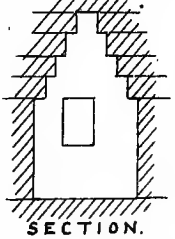
Ka Chamber of Nefermat



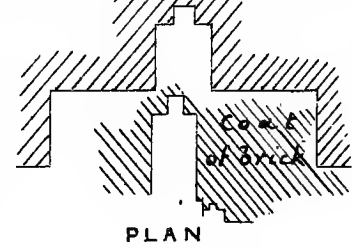
Sepulchre of Ranefer



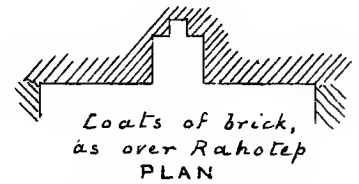
Sepulchre of Ranefer



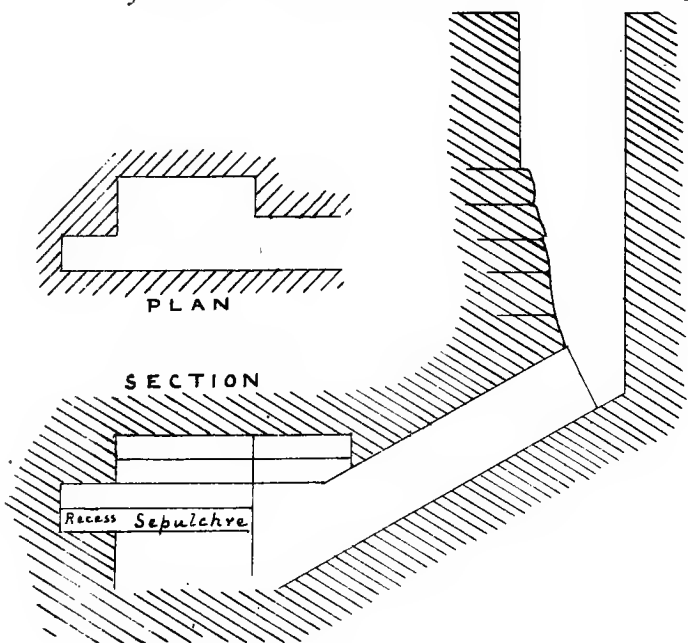
Ka Chamber of Ranefer



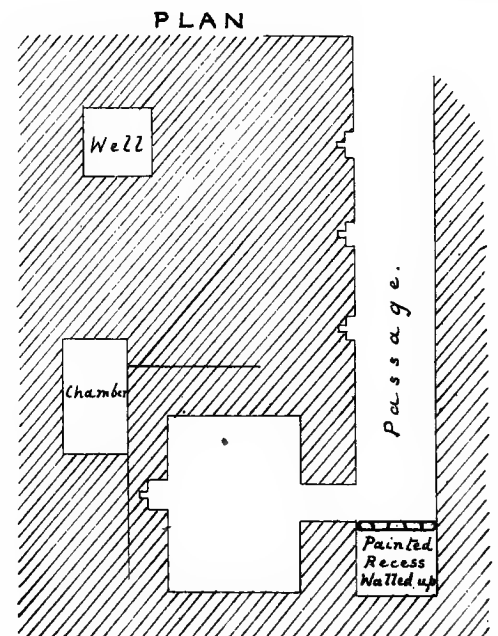
Ka Chamber of Nefert



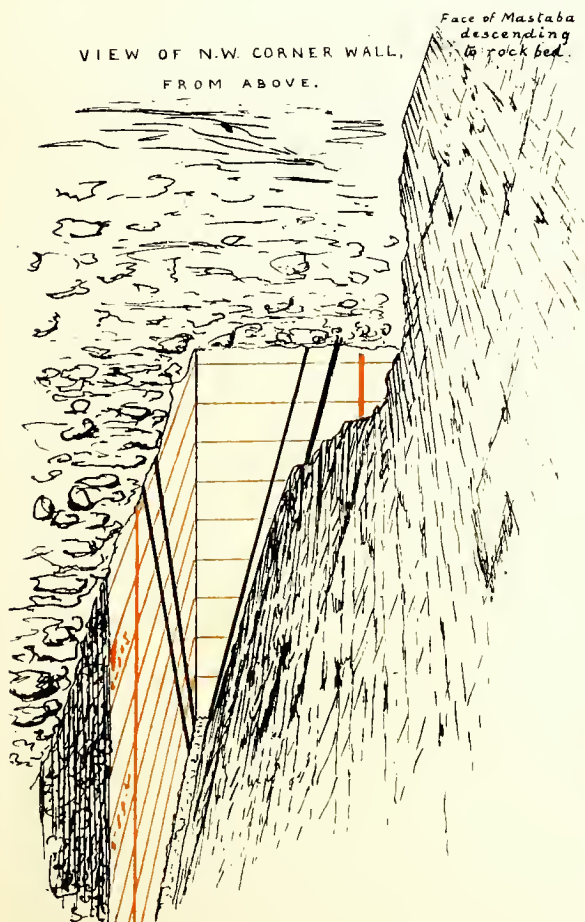
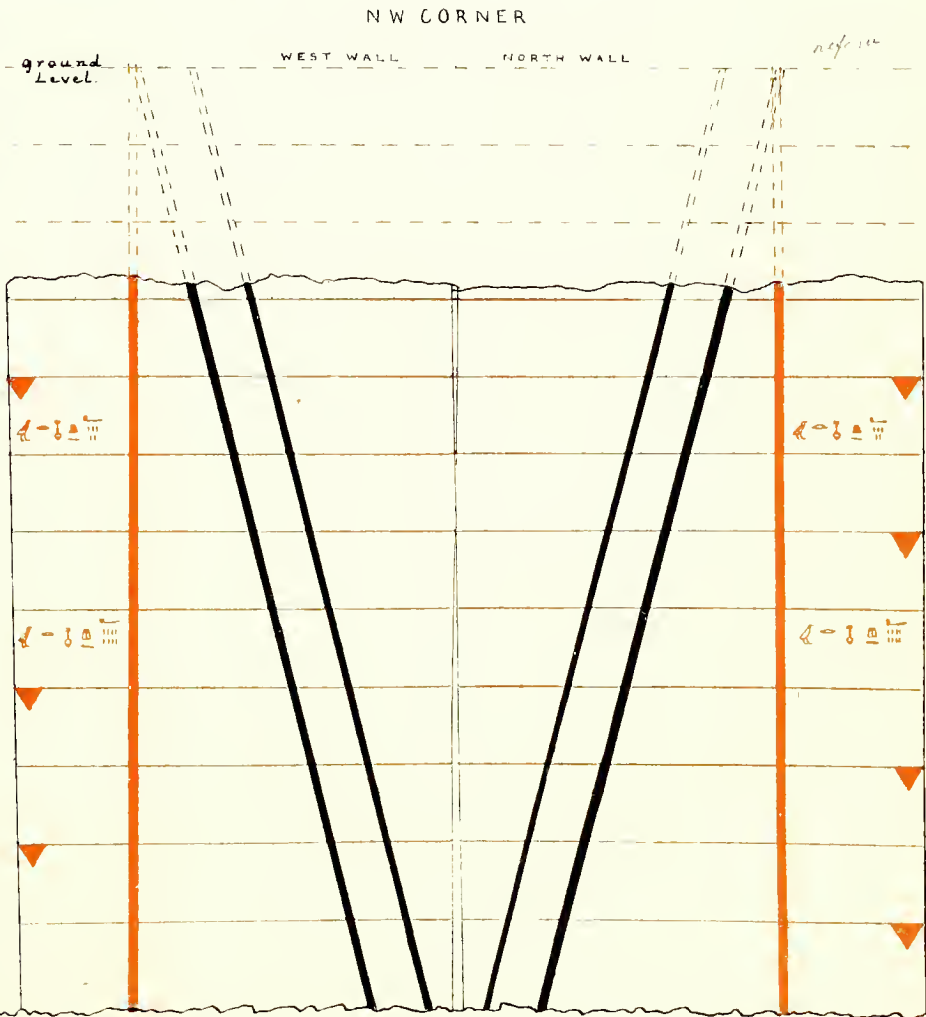
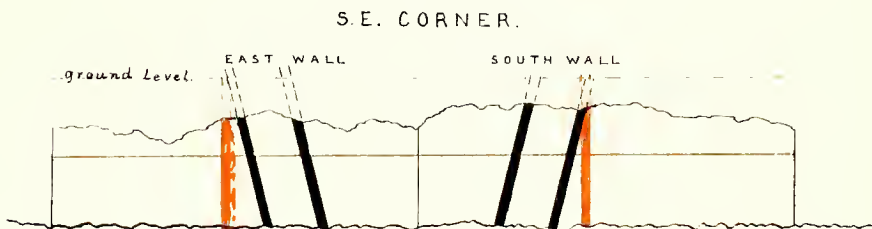
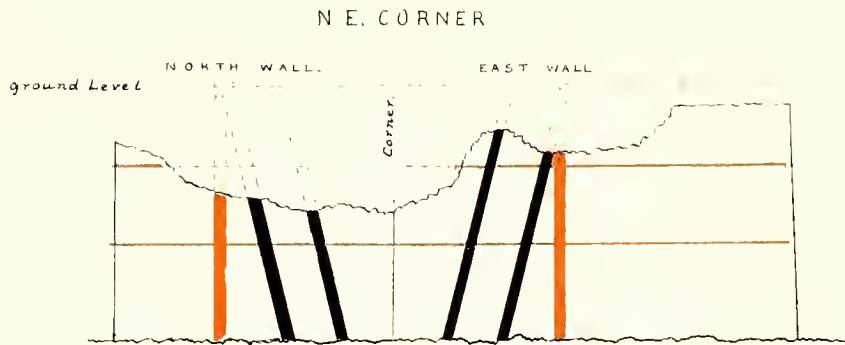
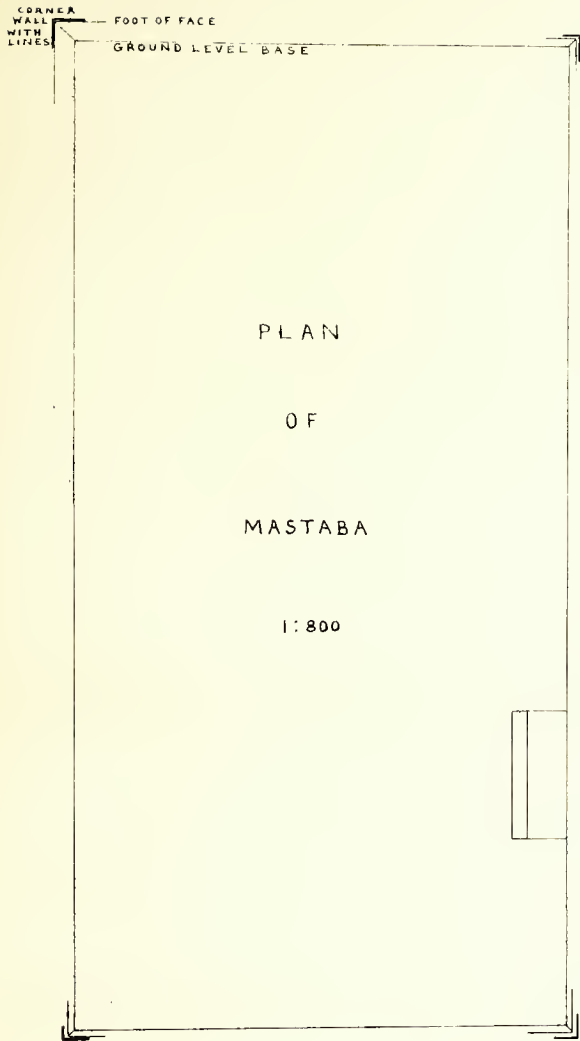
One of the great subterranean tombs W. of pyramid



Small Mastaba E. of pyramid. No. 22.

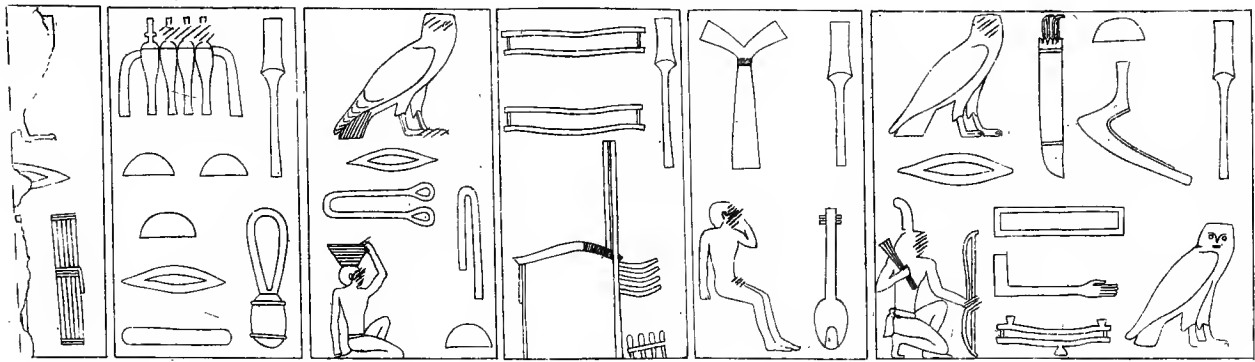










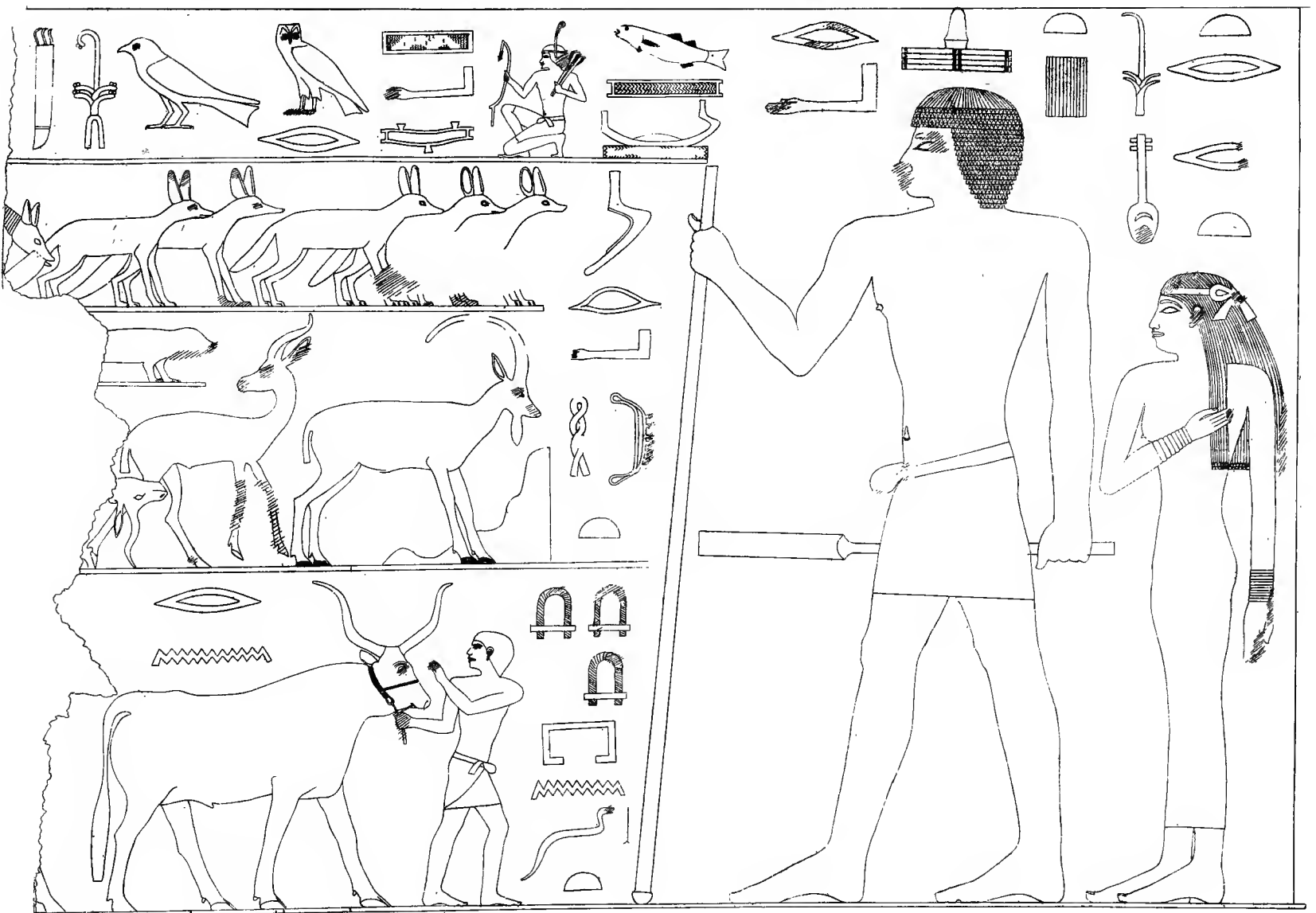


CONTINUED ON NEXT PAGE

*Ḫarsaphē* Ḳw *Ḳadīm*

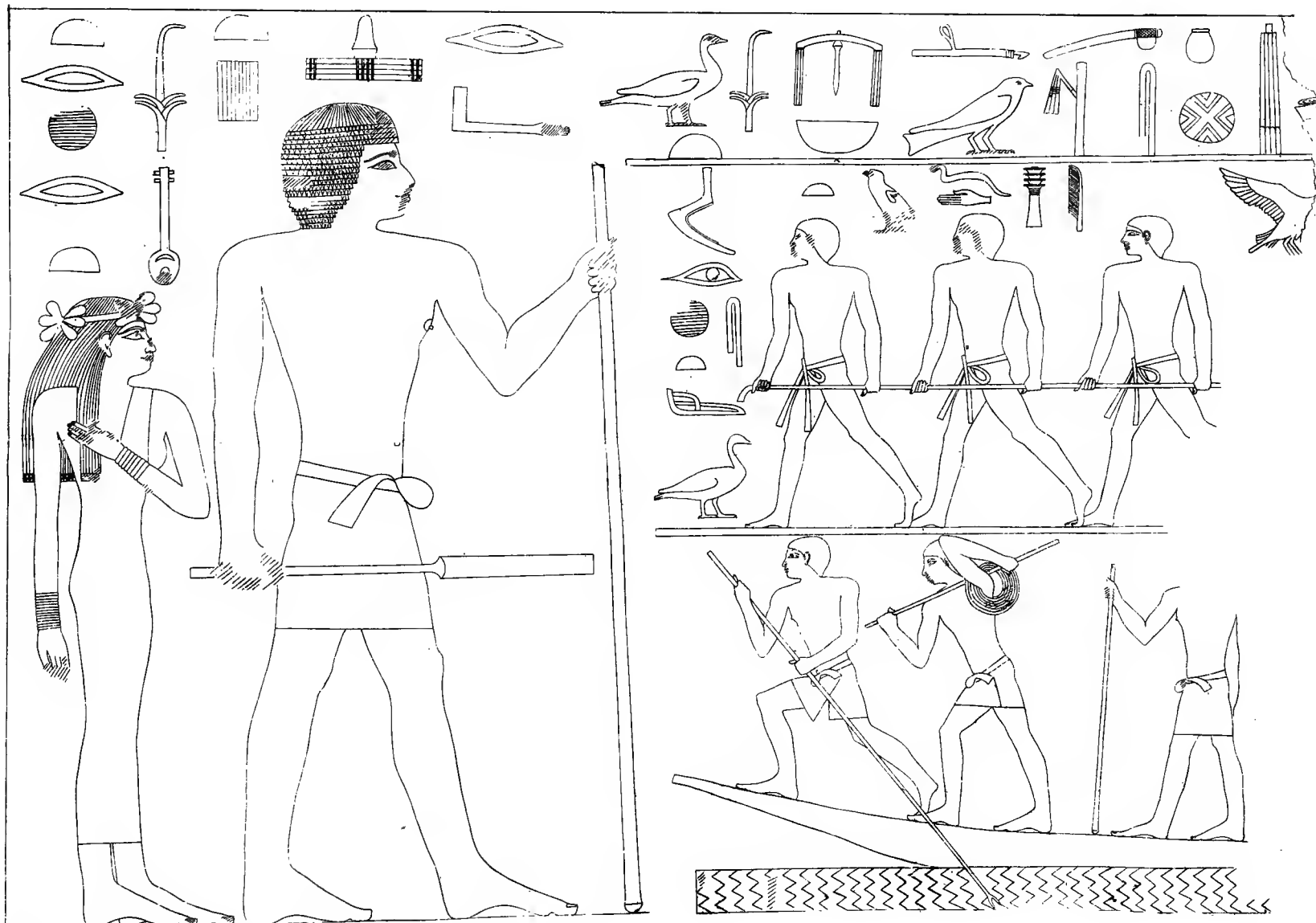
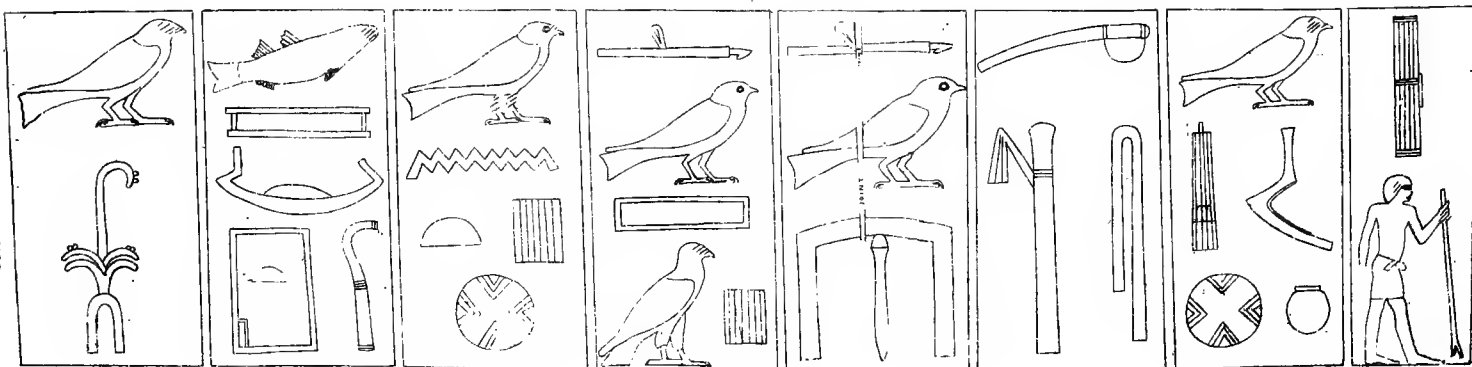
*carabour Harp Stm B p 171*

*Rahotep*

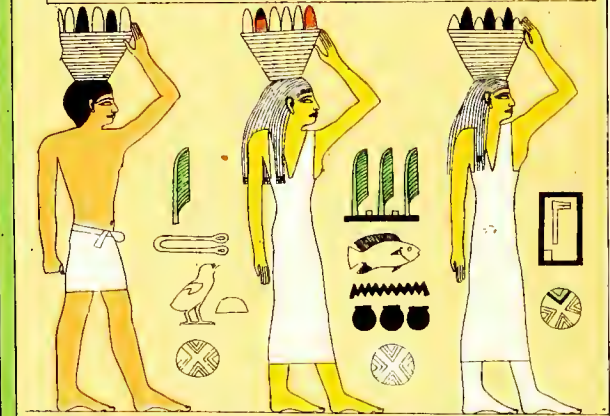
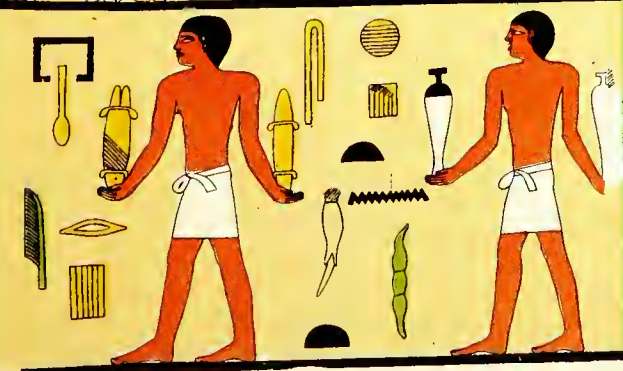




CONTINUED ON LAST PAGE

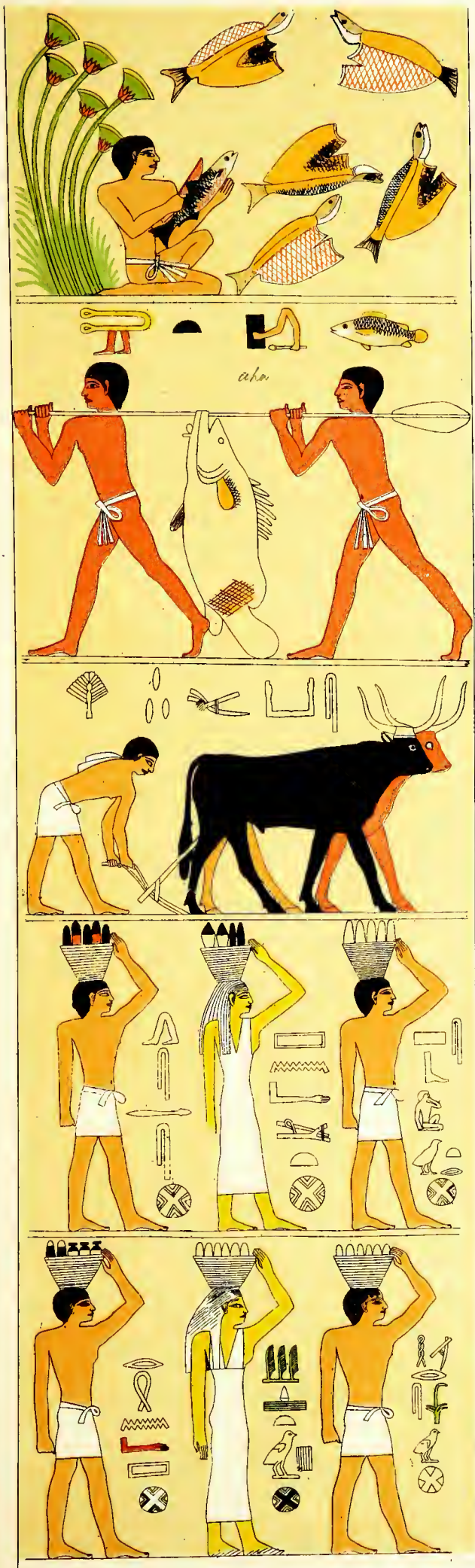




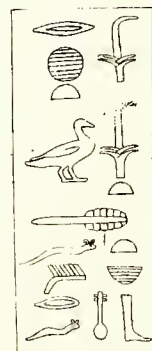






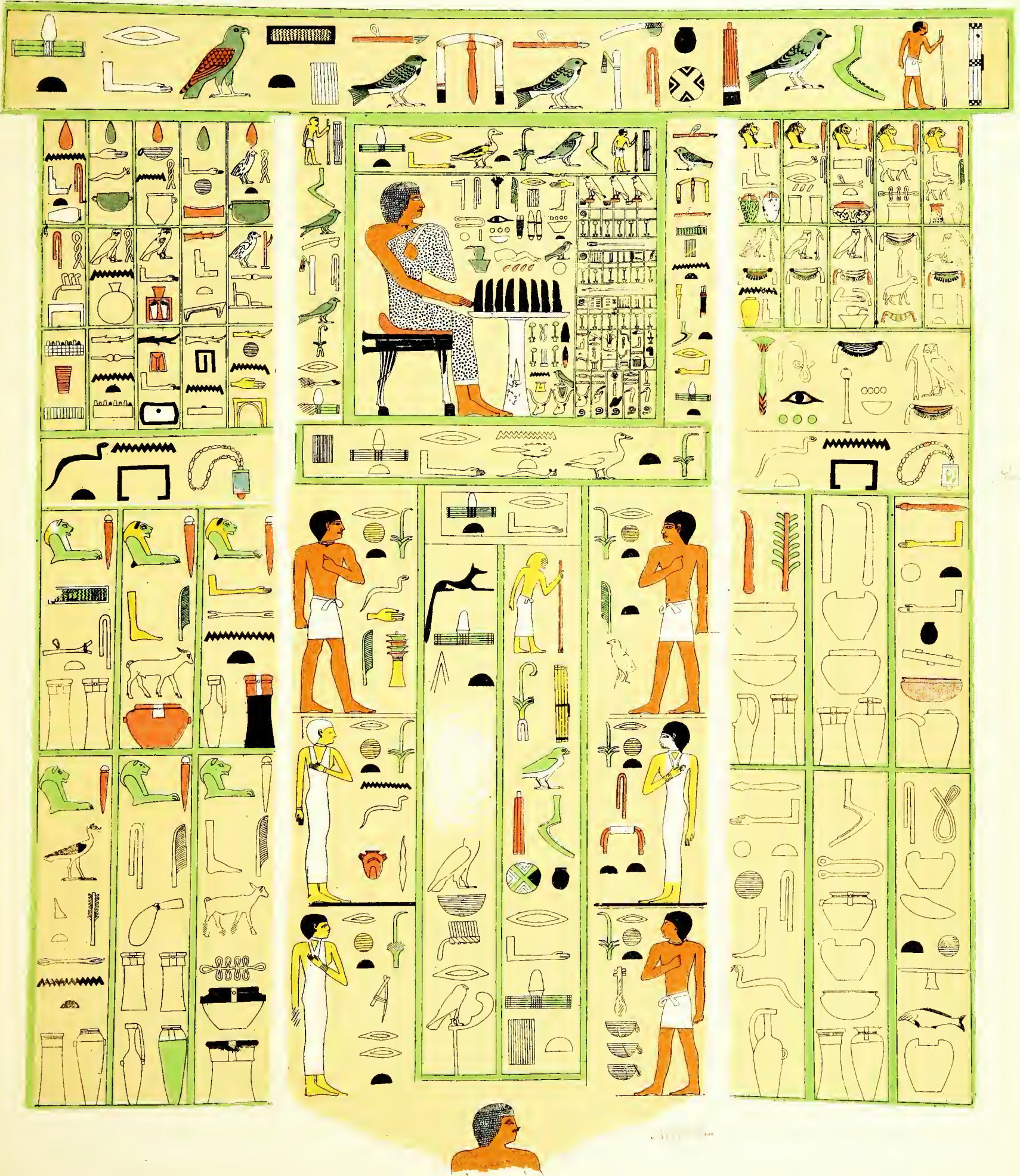


9a 11 30



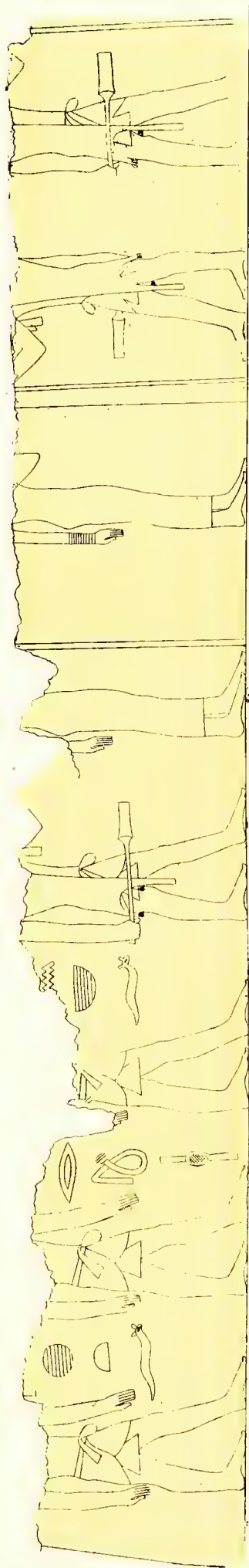
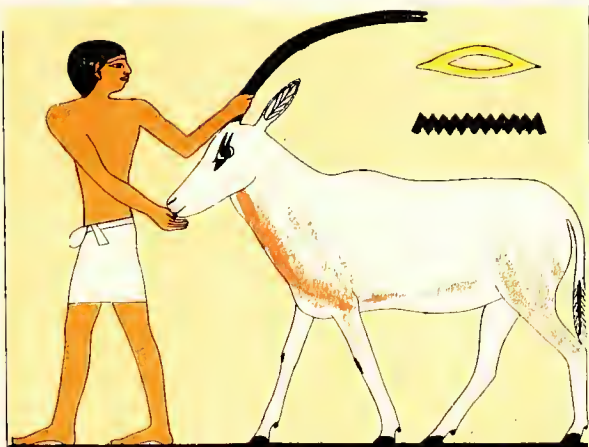




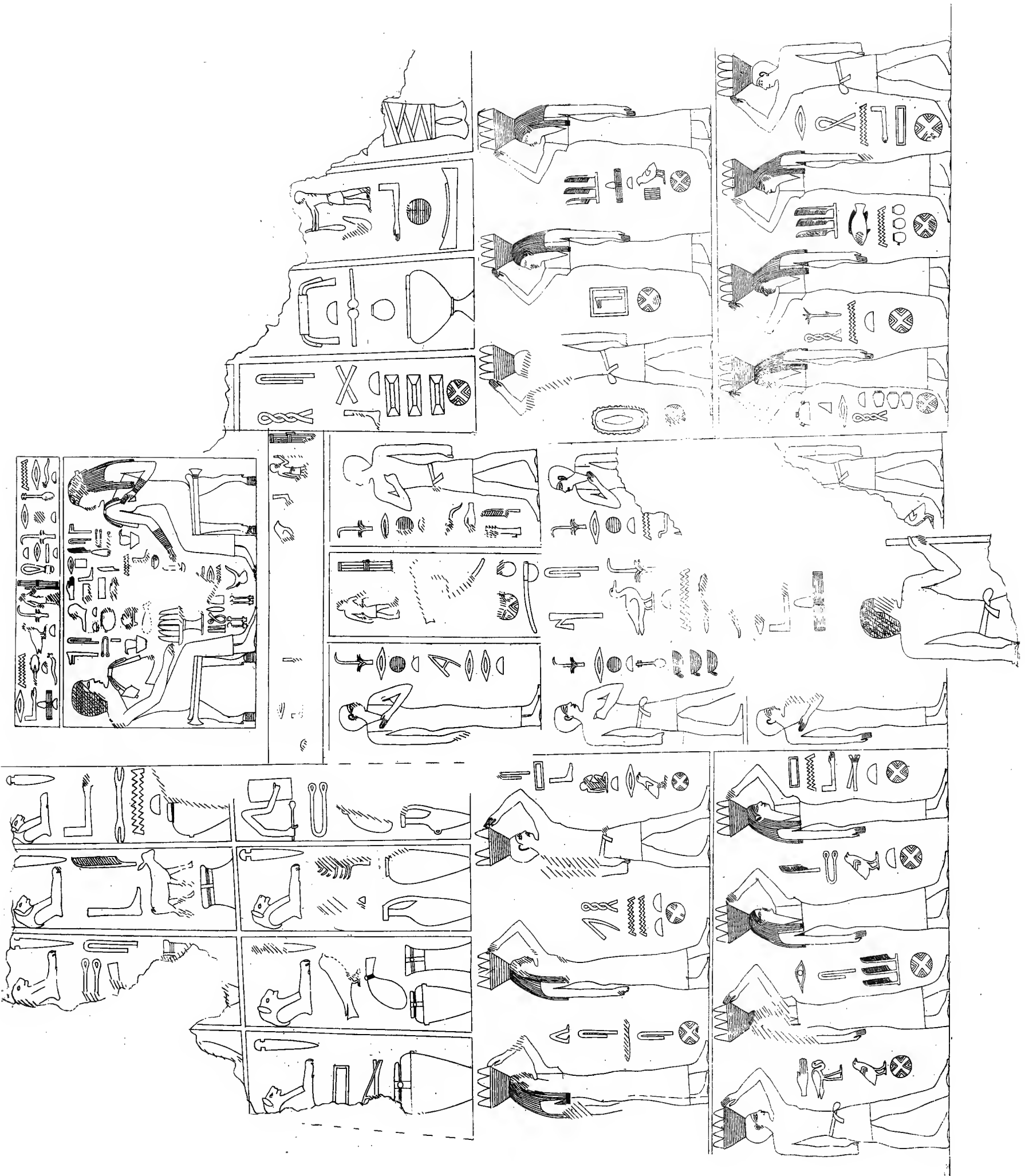




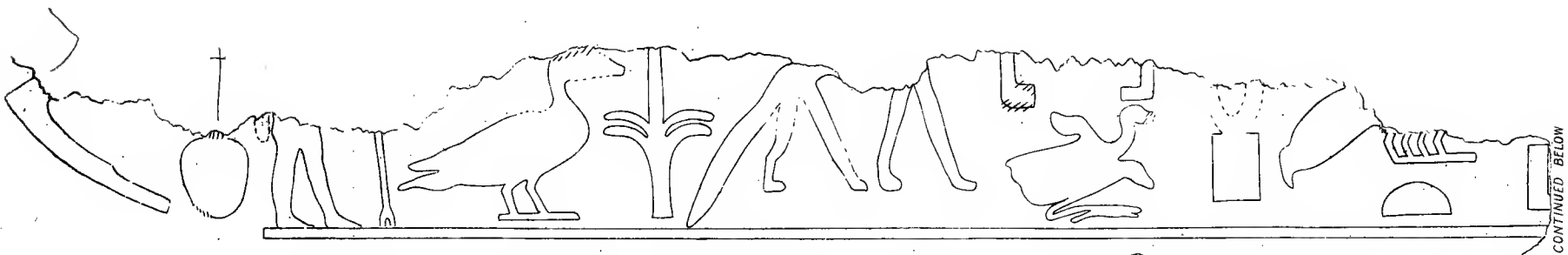




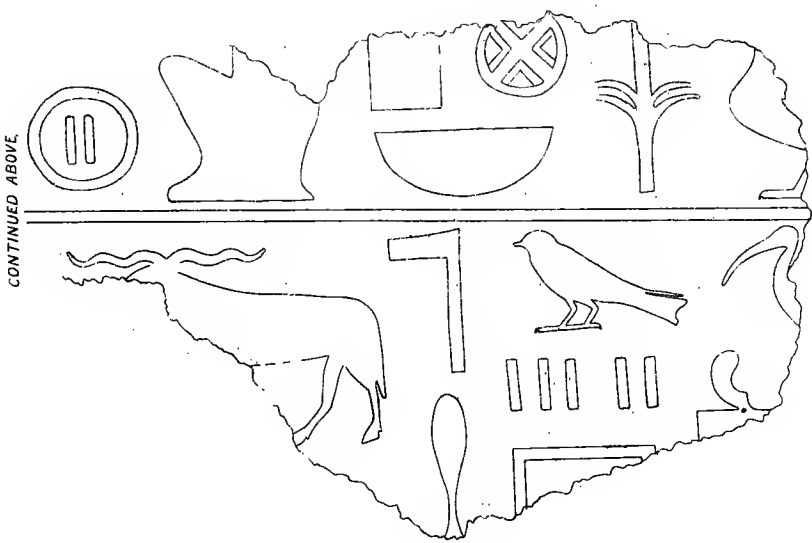
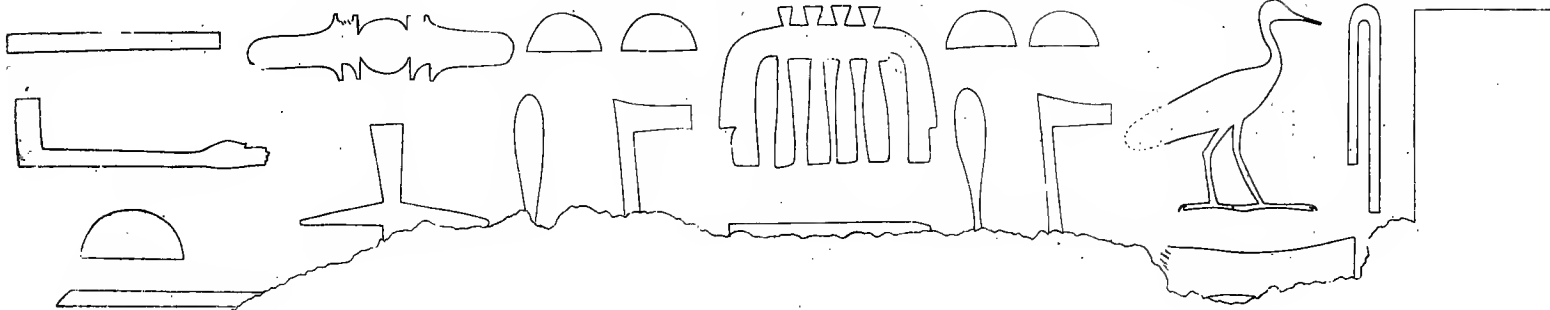




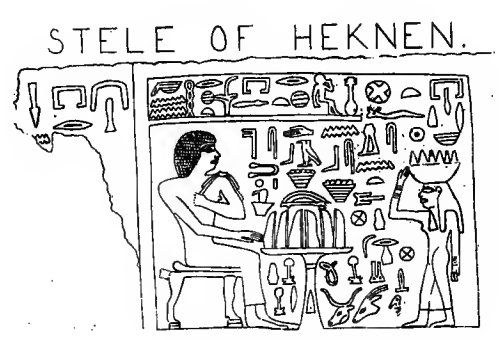
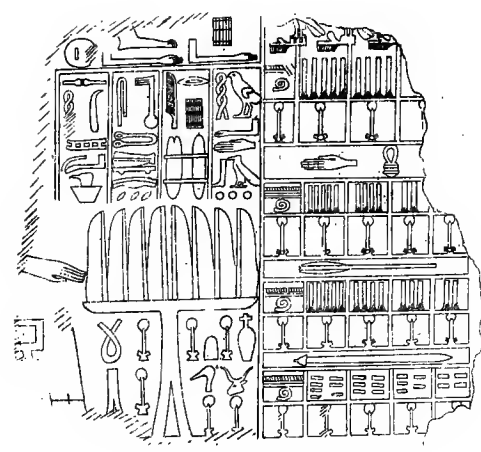




CONTINUED BELOW

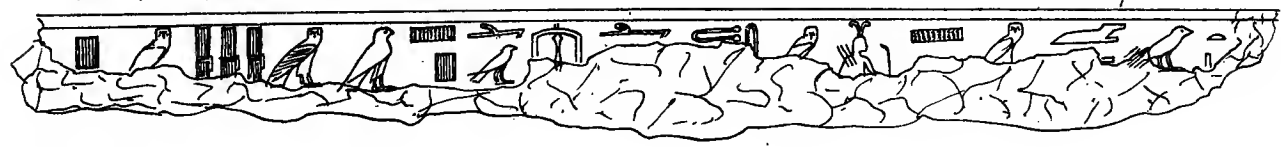


CONTINUED ABOVE



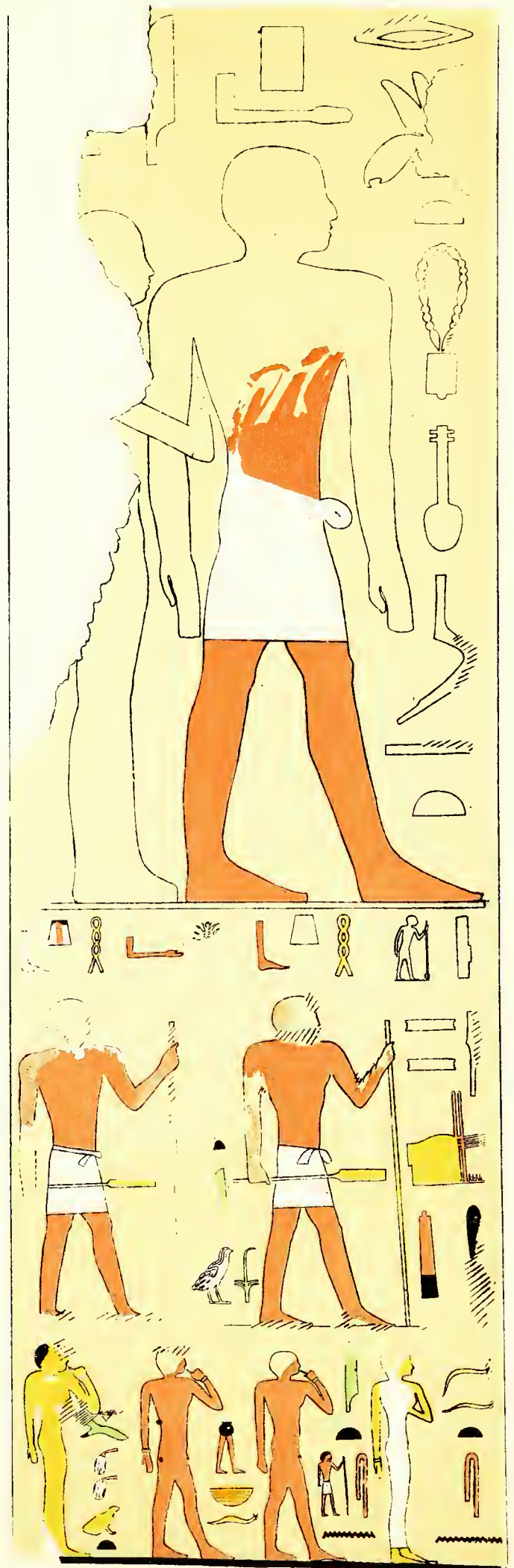
STELE OF HEKNEN.

PORTION OF LINTEL, FROM MASTABA No. 7.

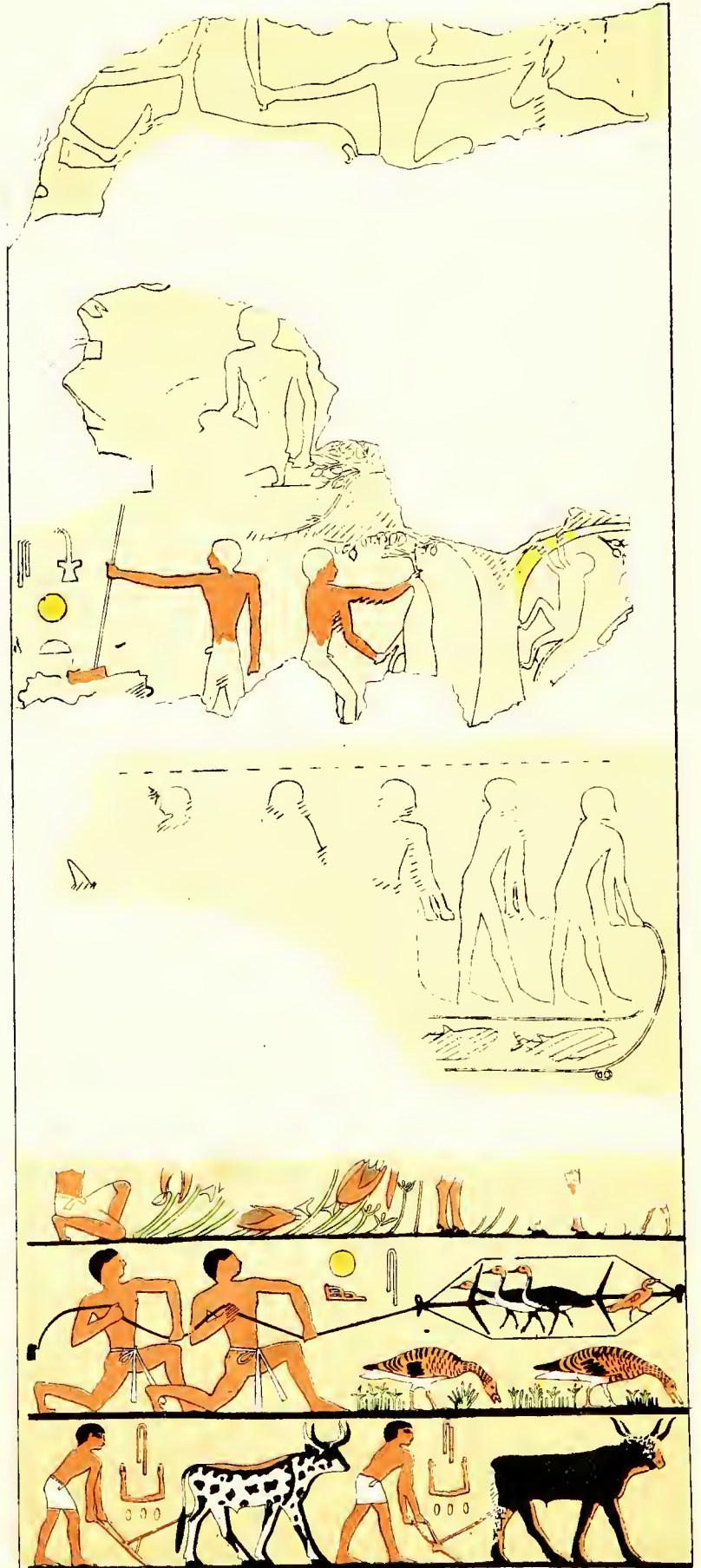
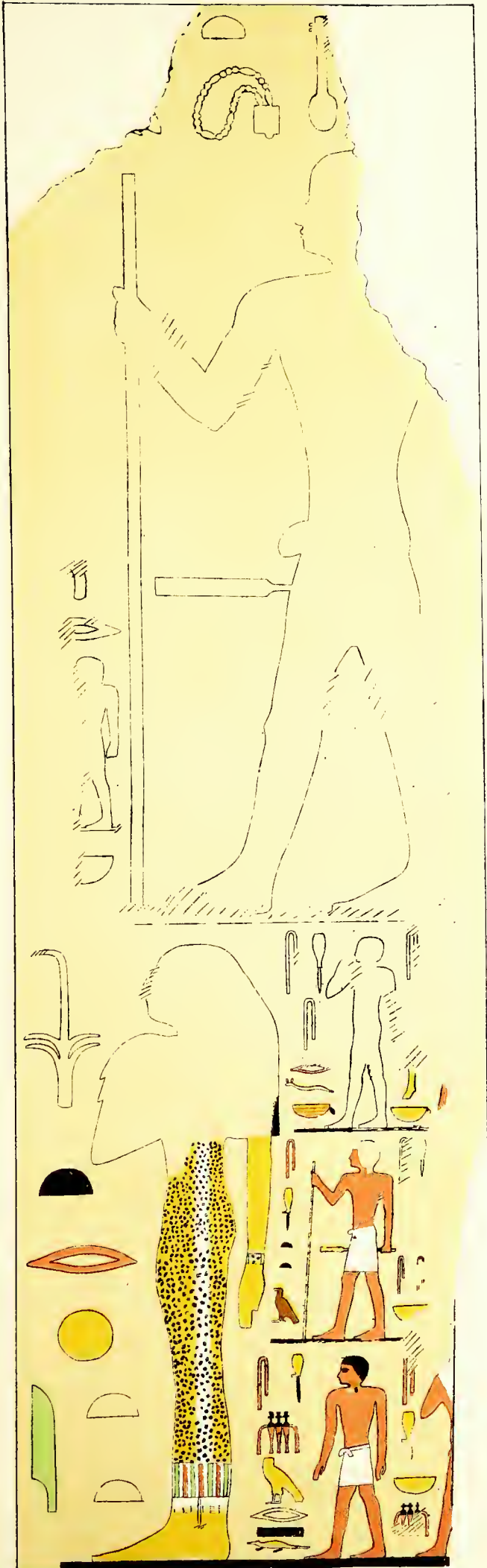




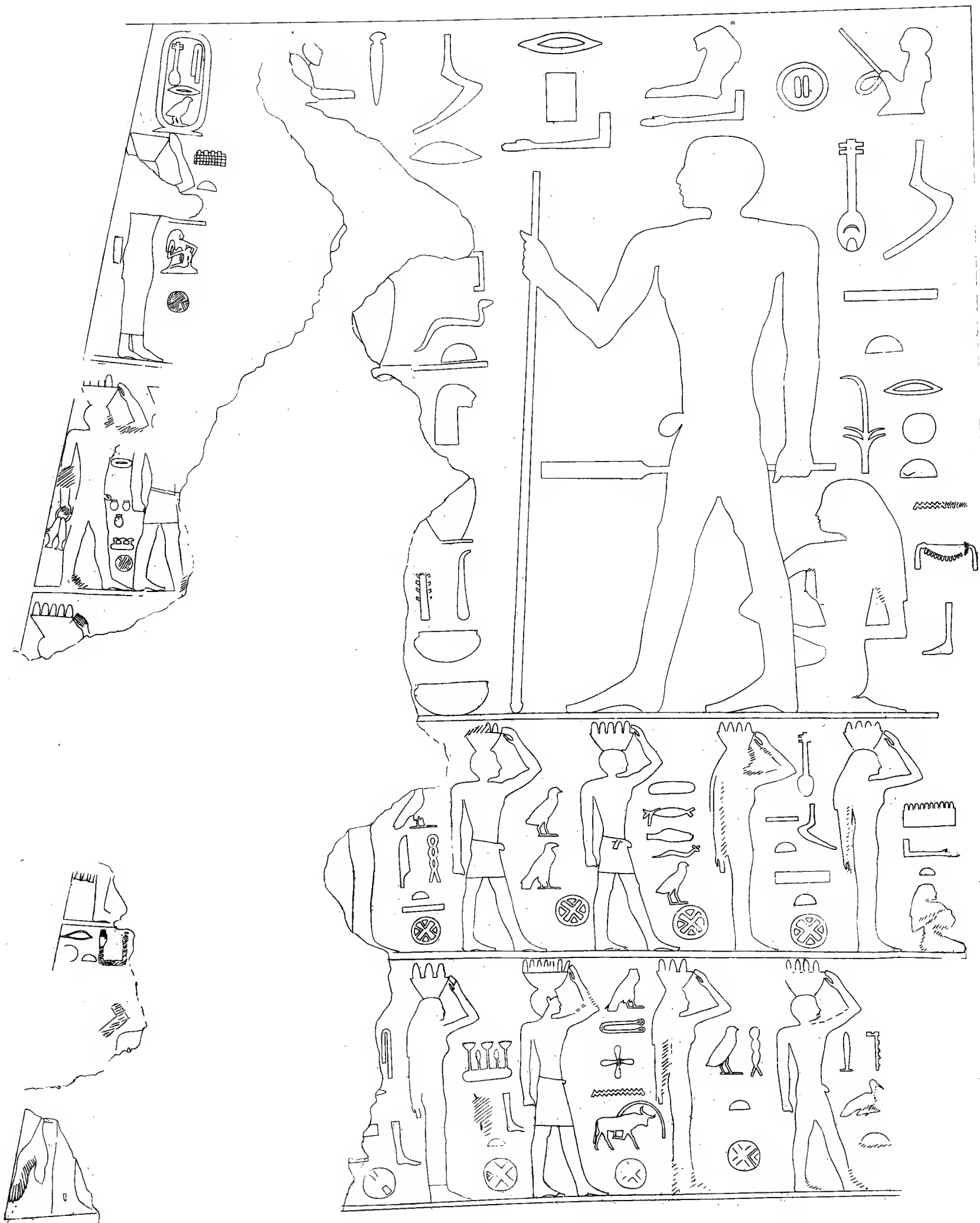






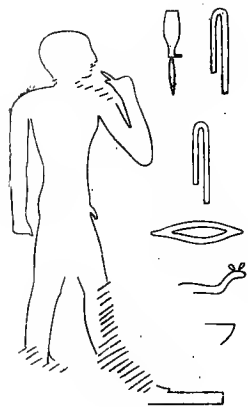
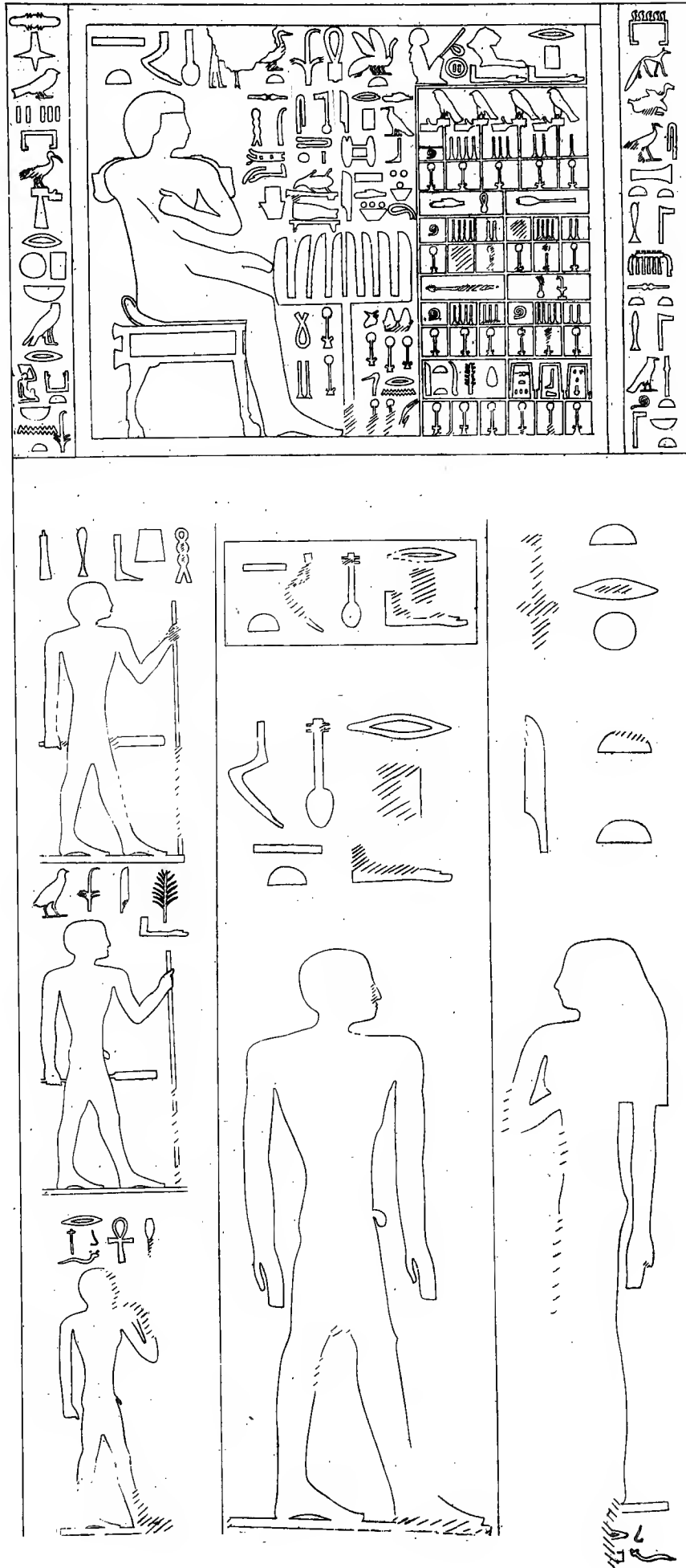






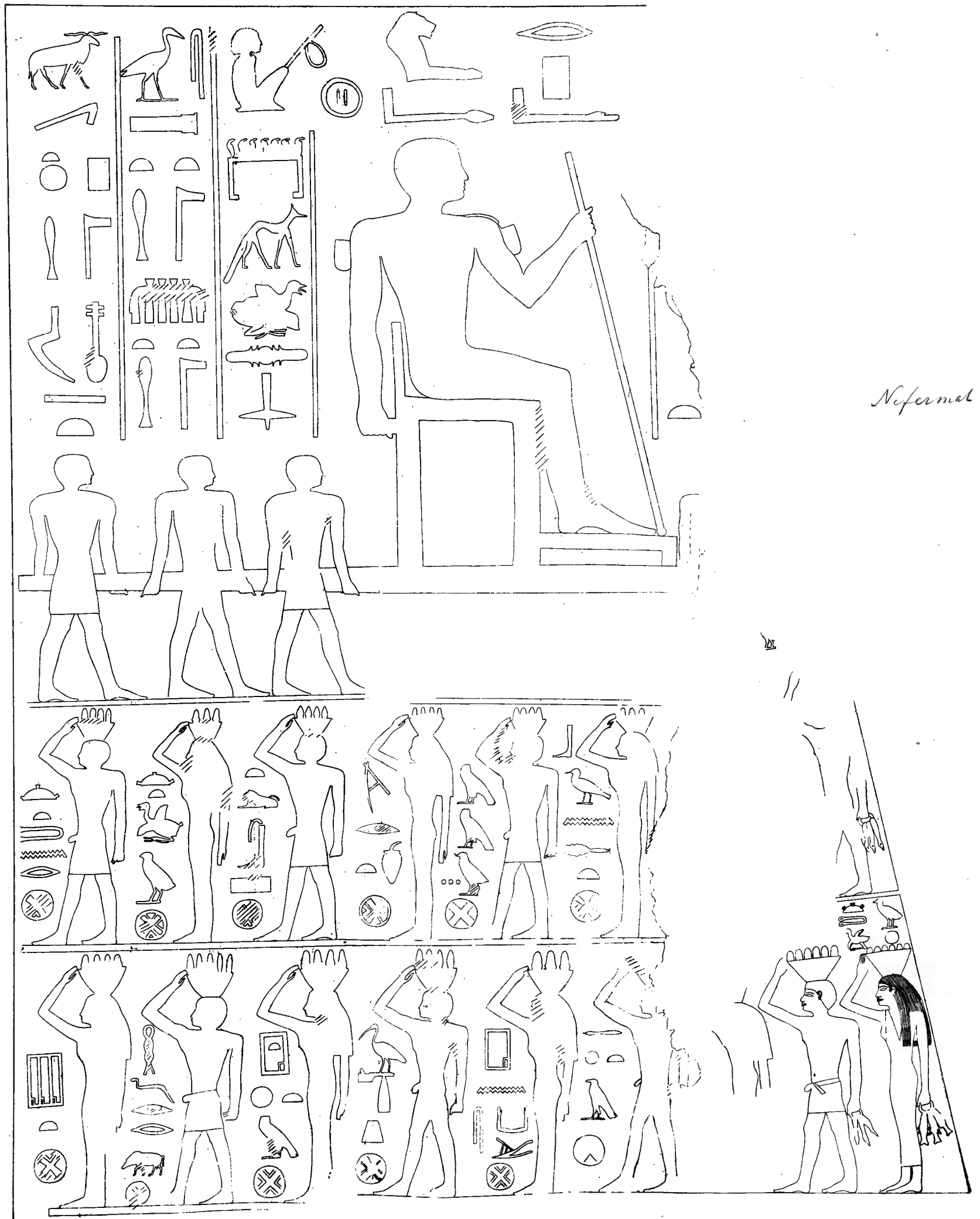




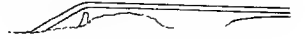
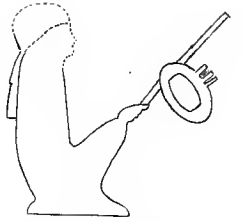
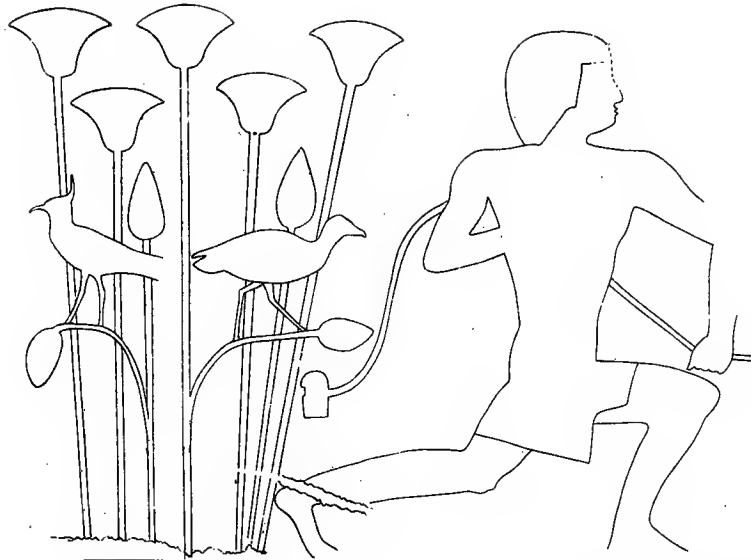




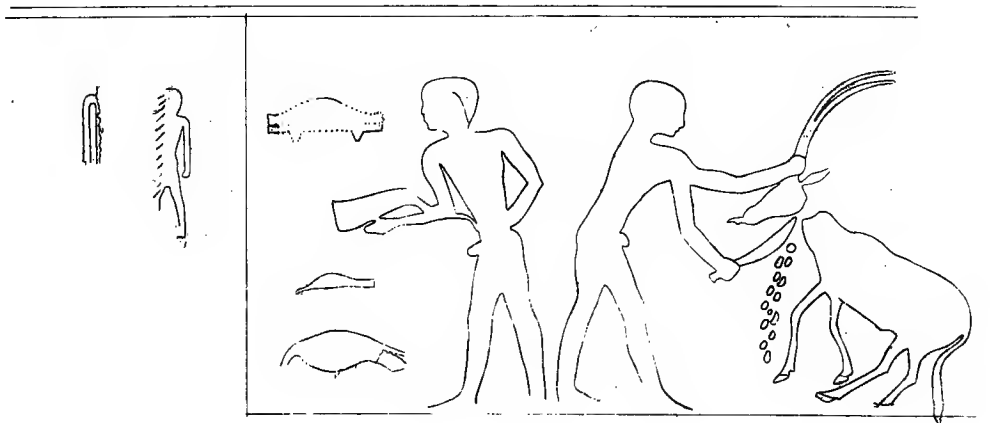
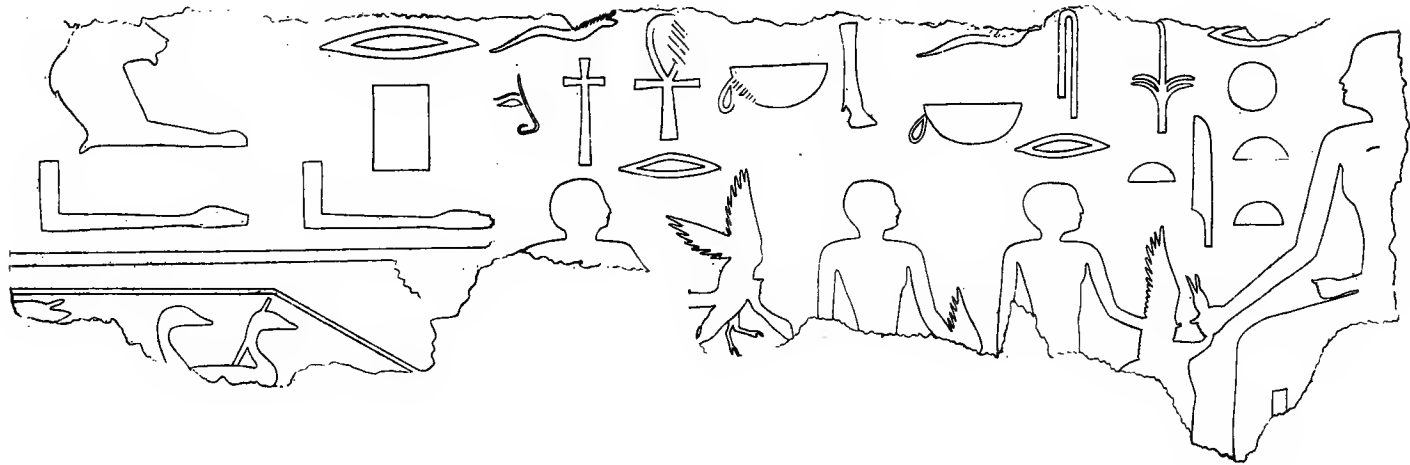
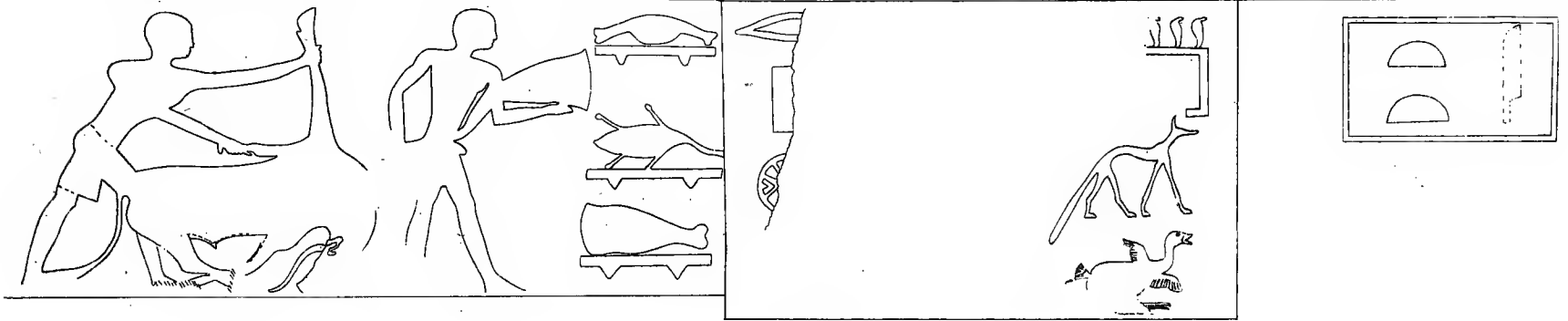




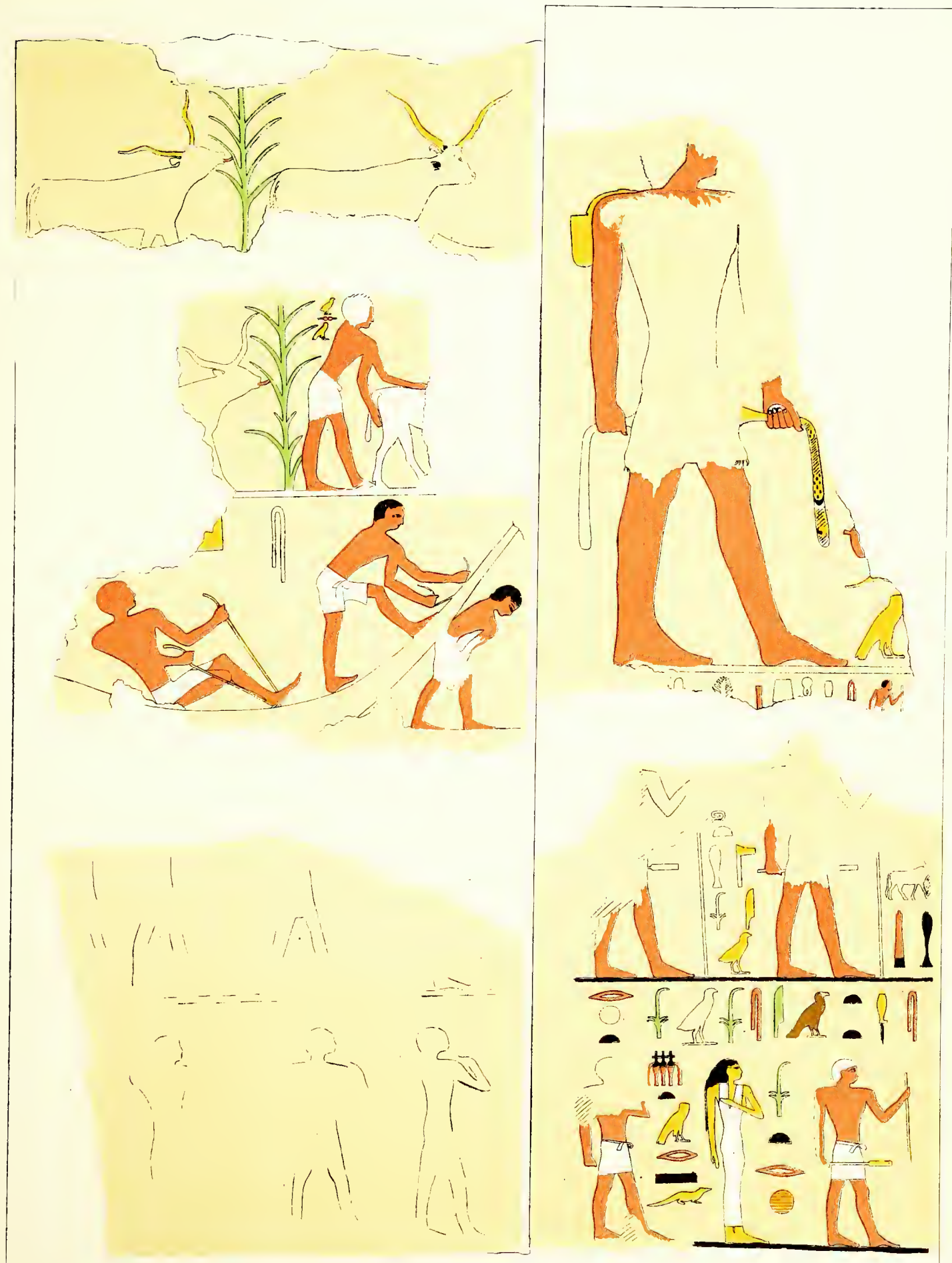




ari

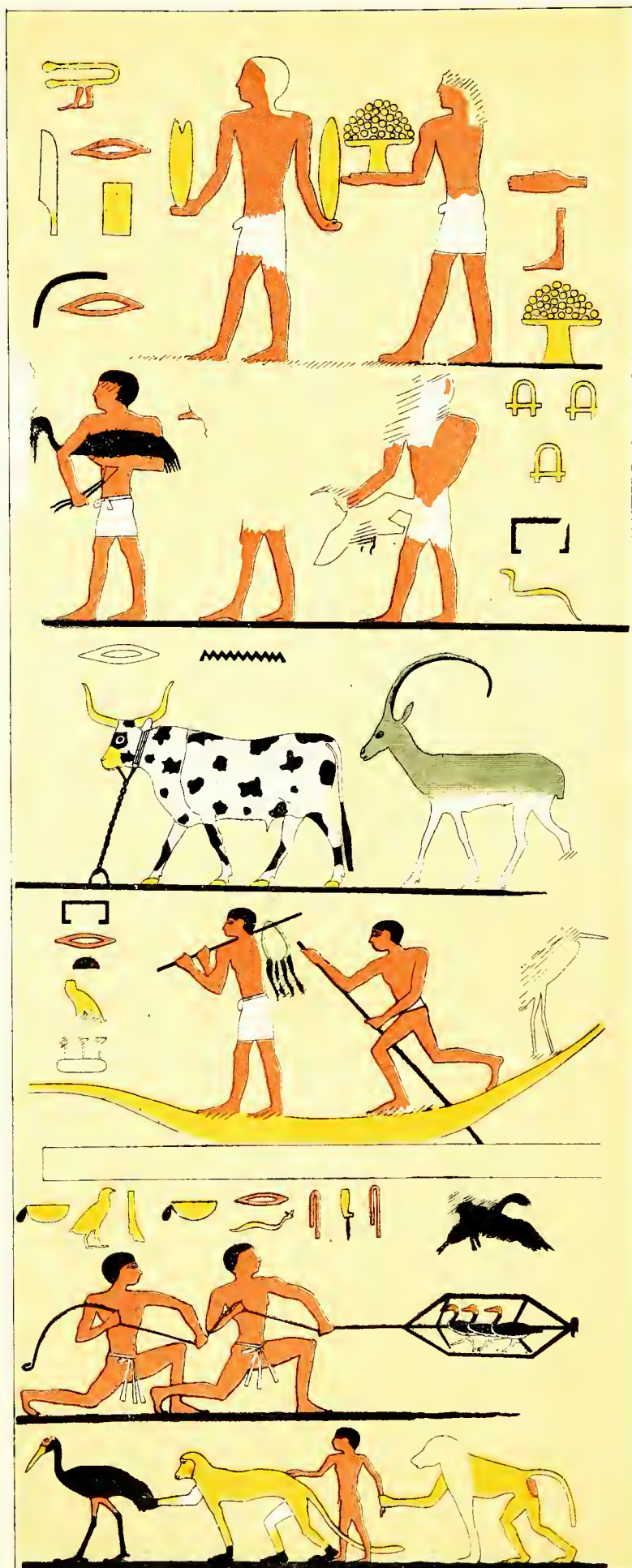
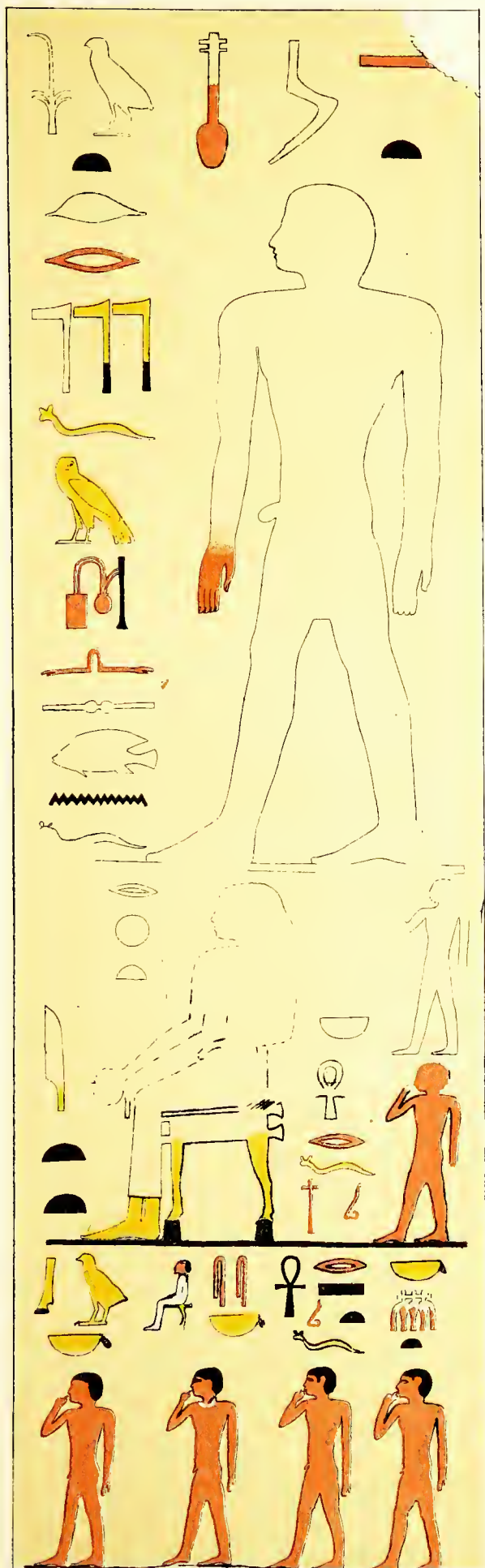






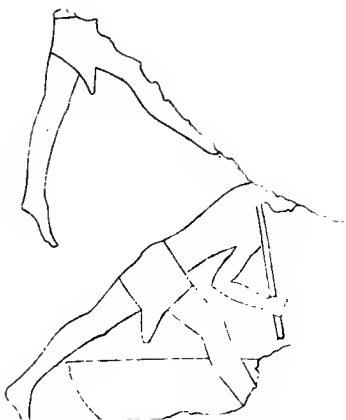
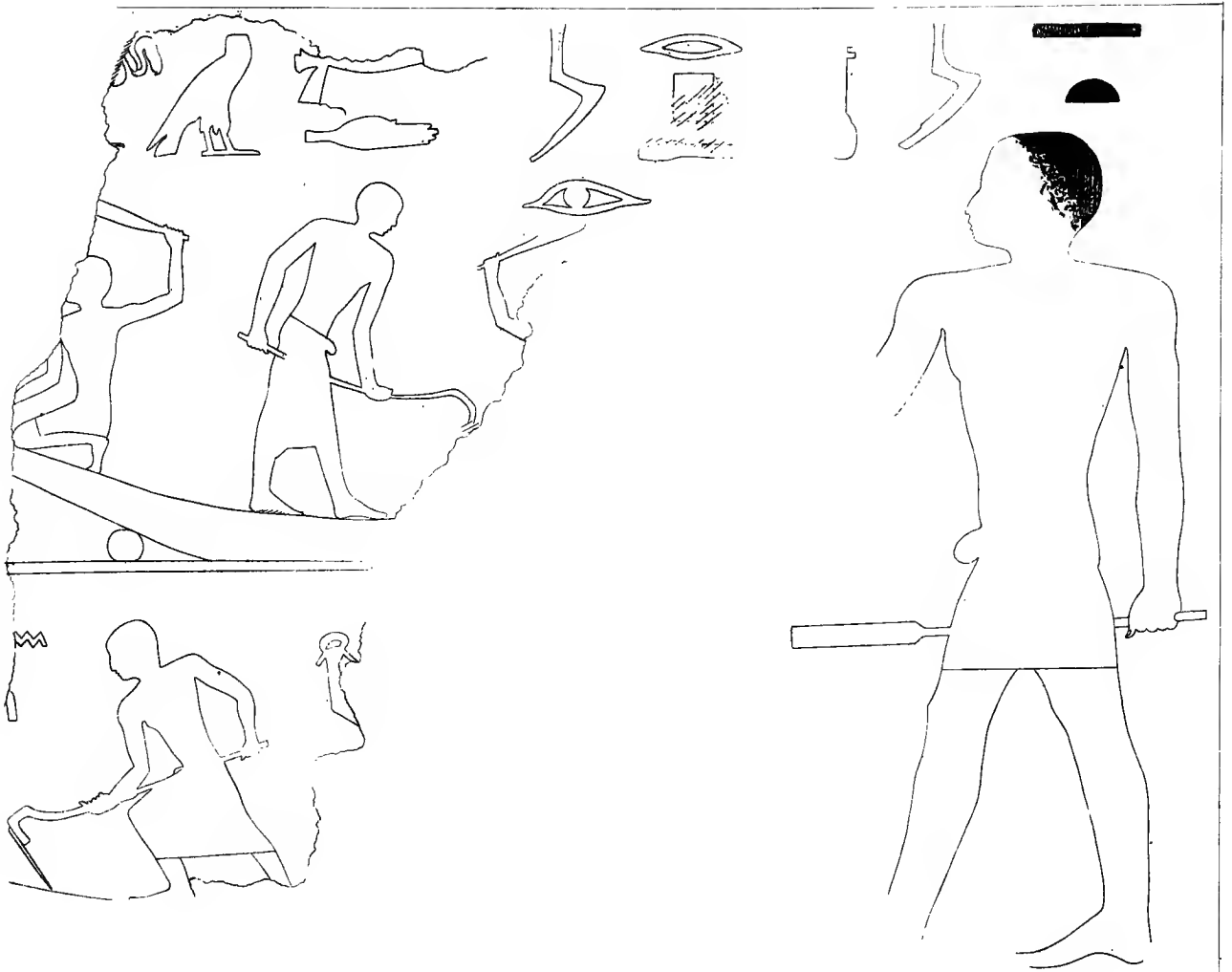




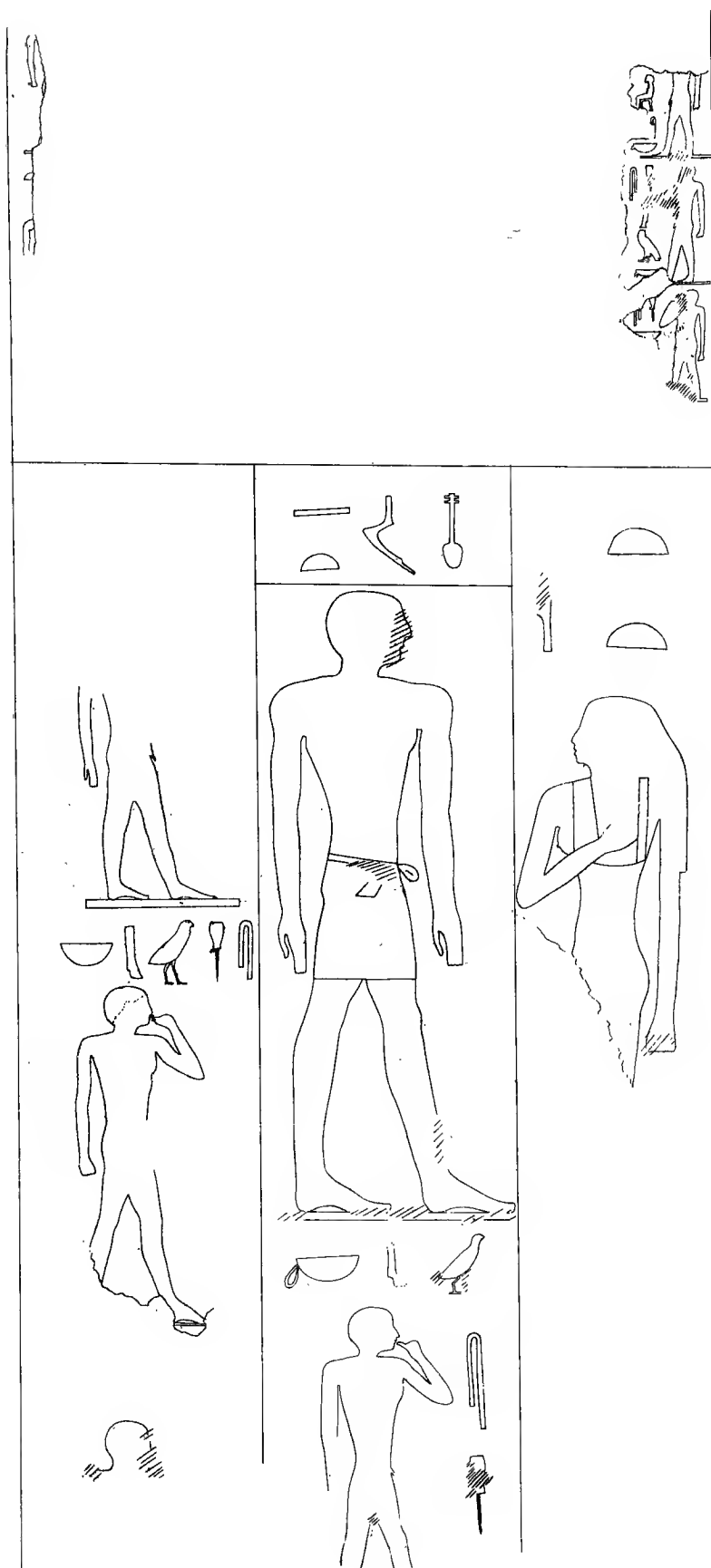




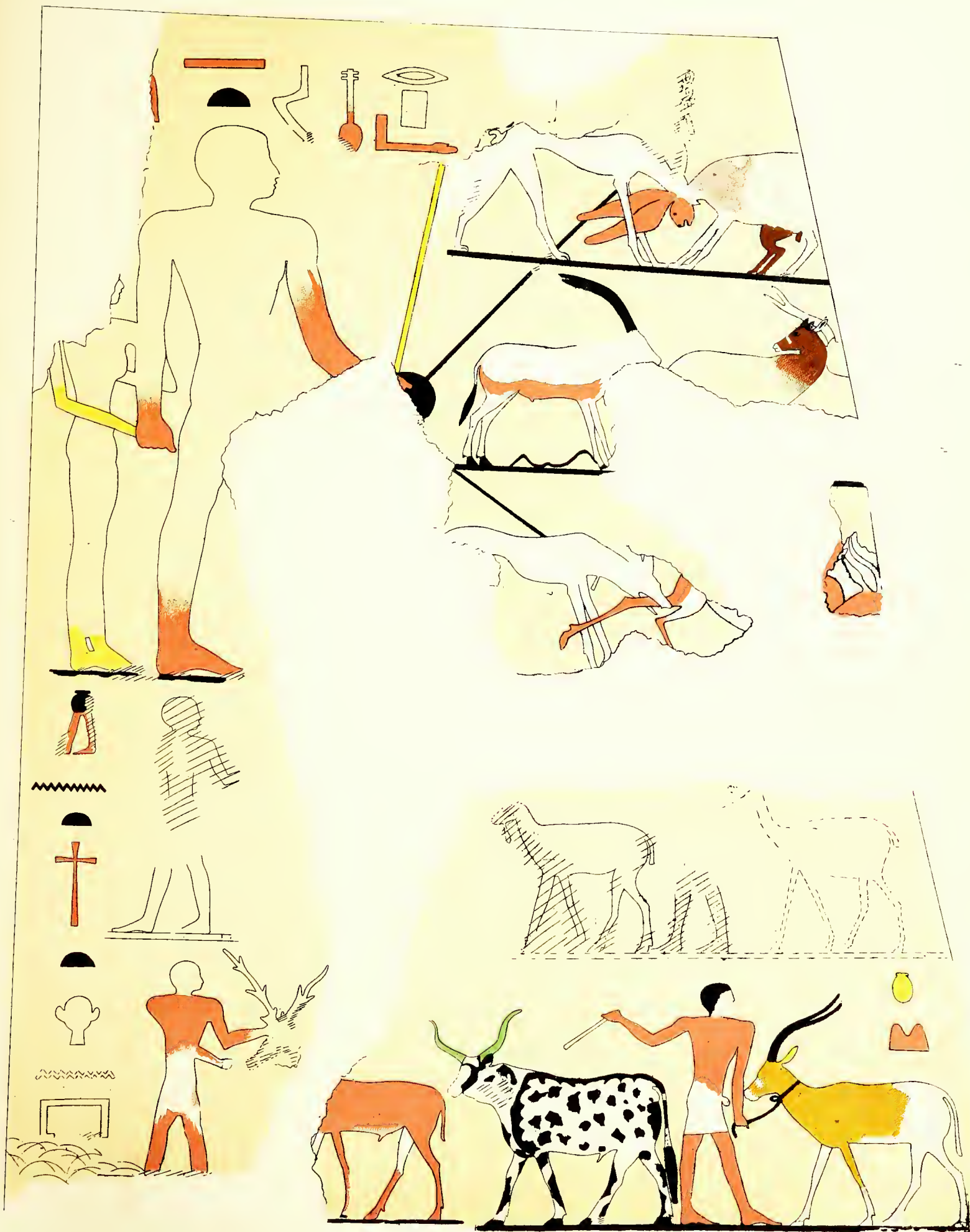






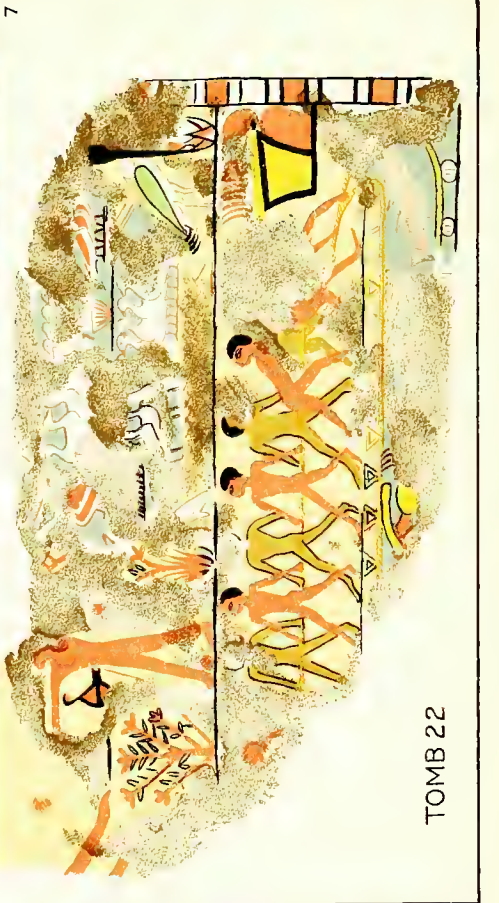
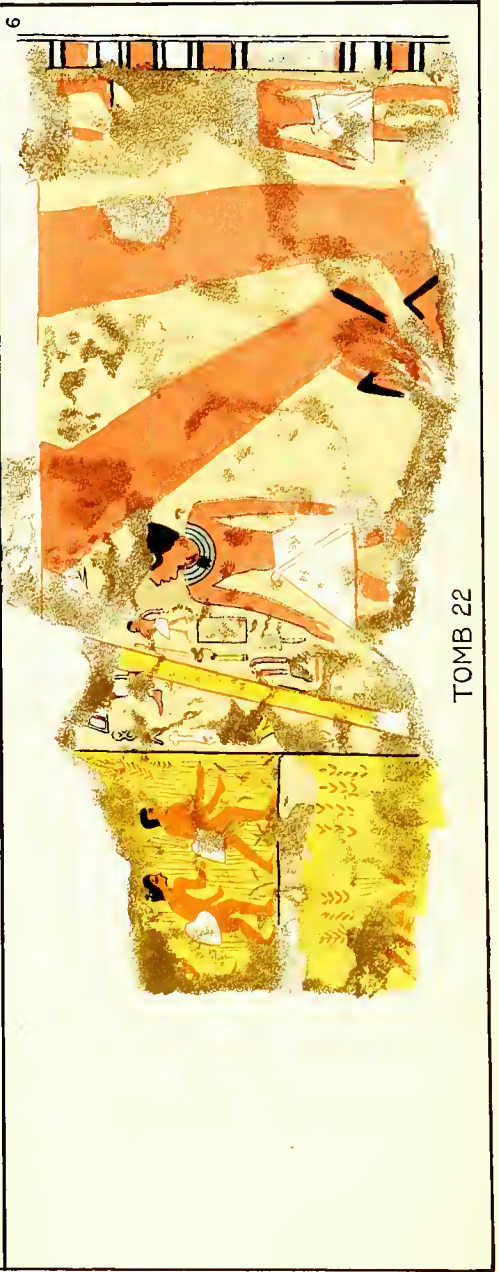
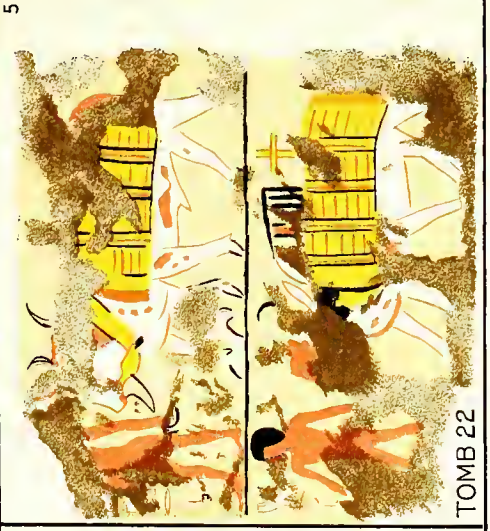
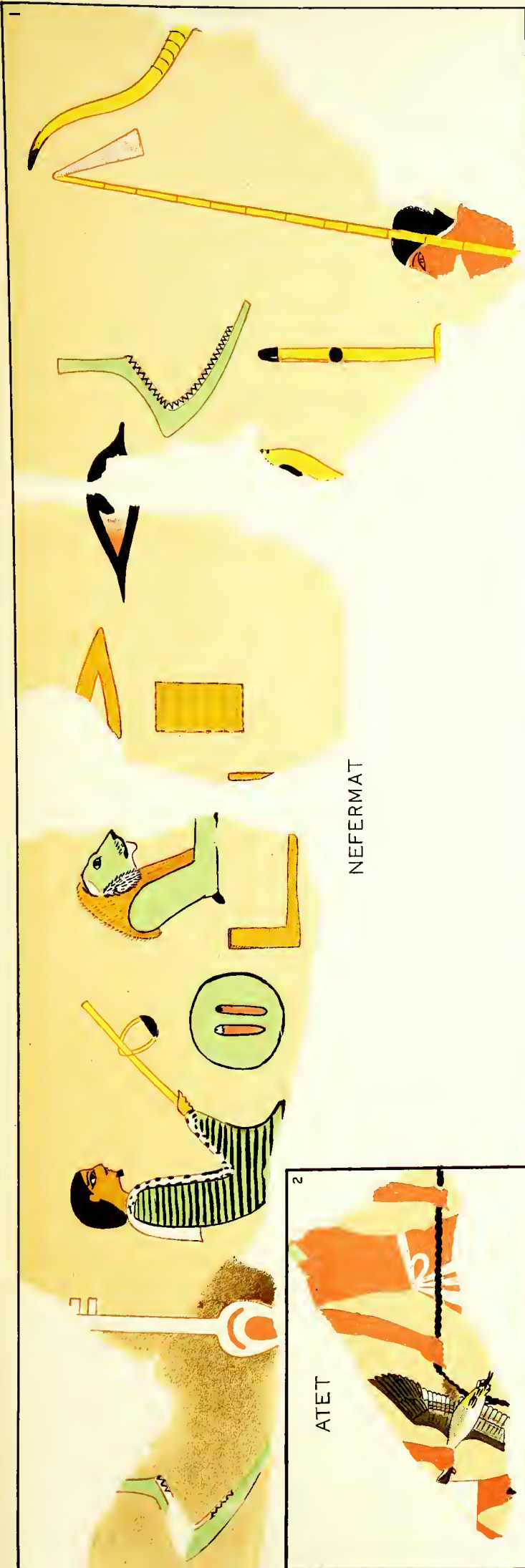








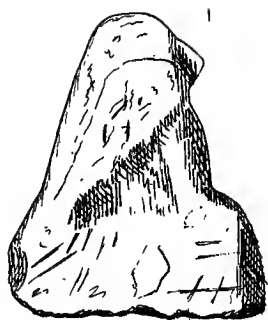








TEMPLE.



Limestone



Limestone.



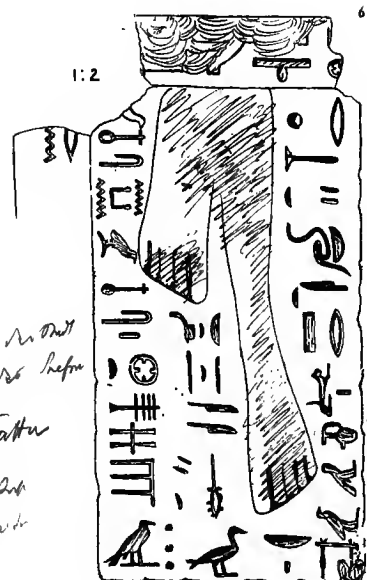
Blue glaze.



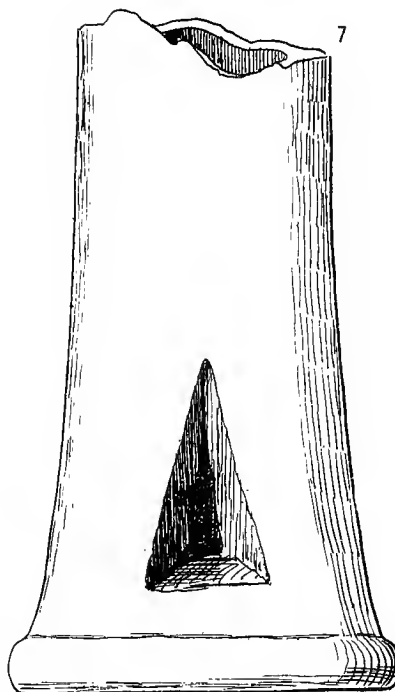
grey Limestone.



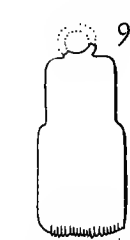
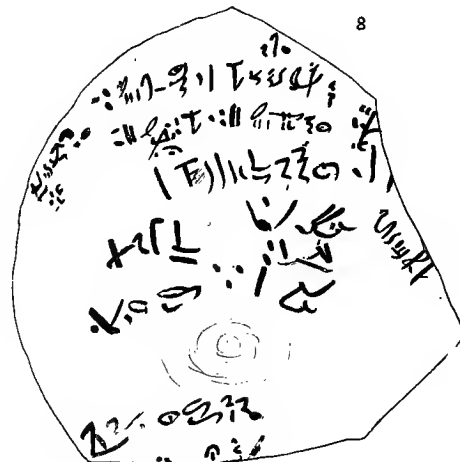
Limestone



Black Serpentine



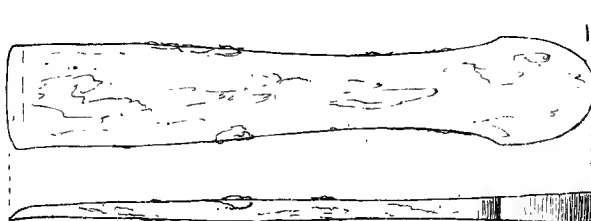
Brown Basalt.



Ivory. Mastaba 7



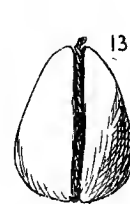
Horn. Tomb 25



Copper Adze. Well of Rahoetep. No. 6.



Copper Saw, chip-ground N. of No 17



Limestone Plummets, chip filling of No 17.

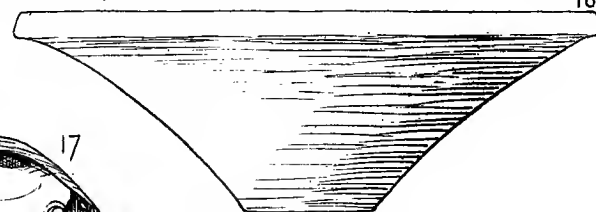


Bronze Chisel among pyramid fragments XVIII? L. 7

ALABASTER AND POTTERY BOWLS, FLINTS, etc, MASTABA No. 8.



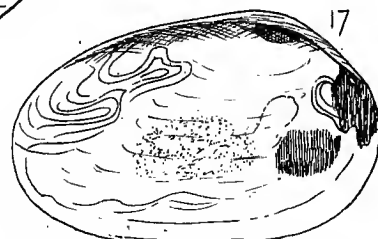
Alabaster.



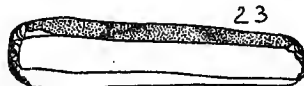
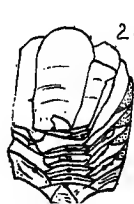
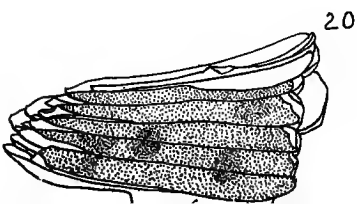
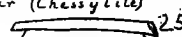
Red Pottery



Copper Needles.



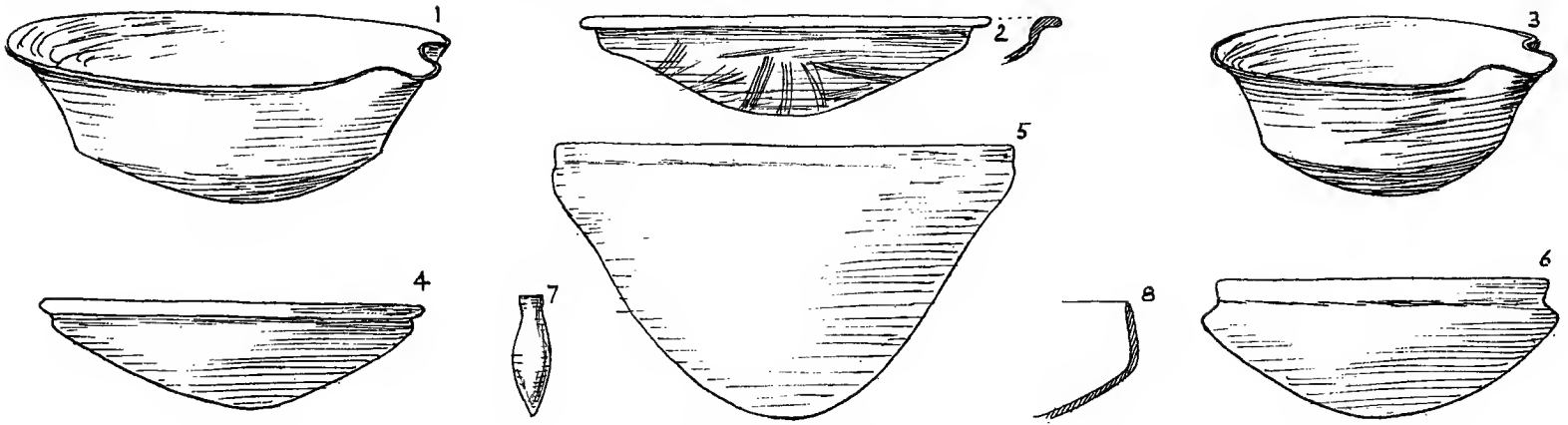
shell containing colour (Chessylite)



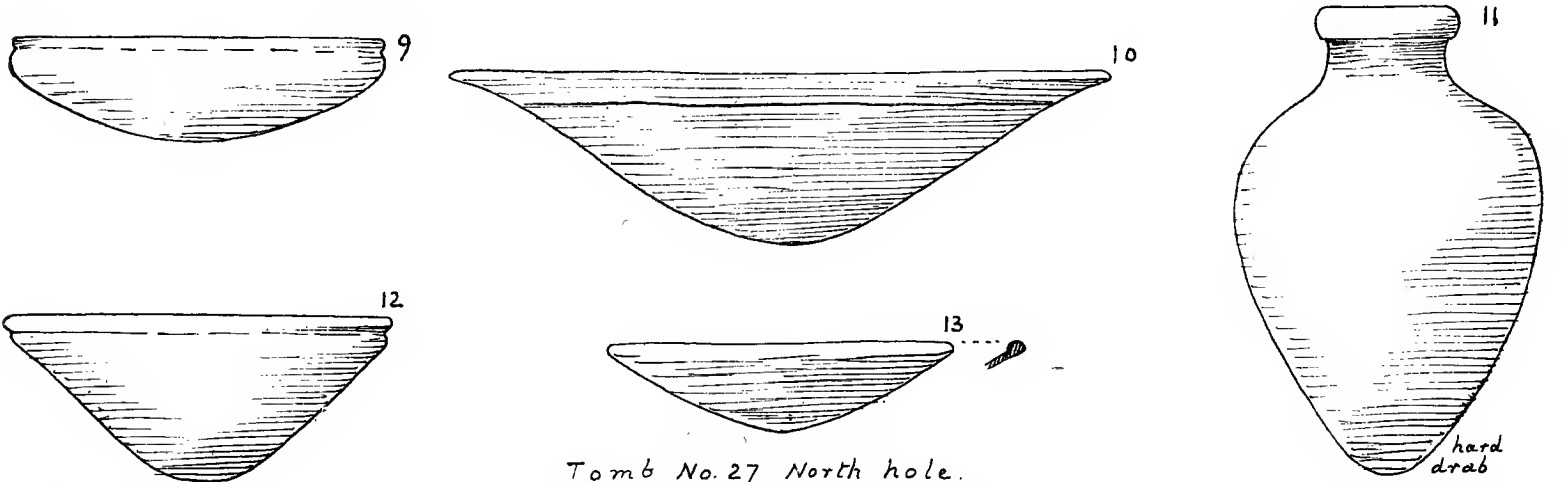
Worked Flints, from the surface.



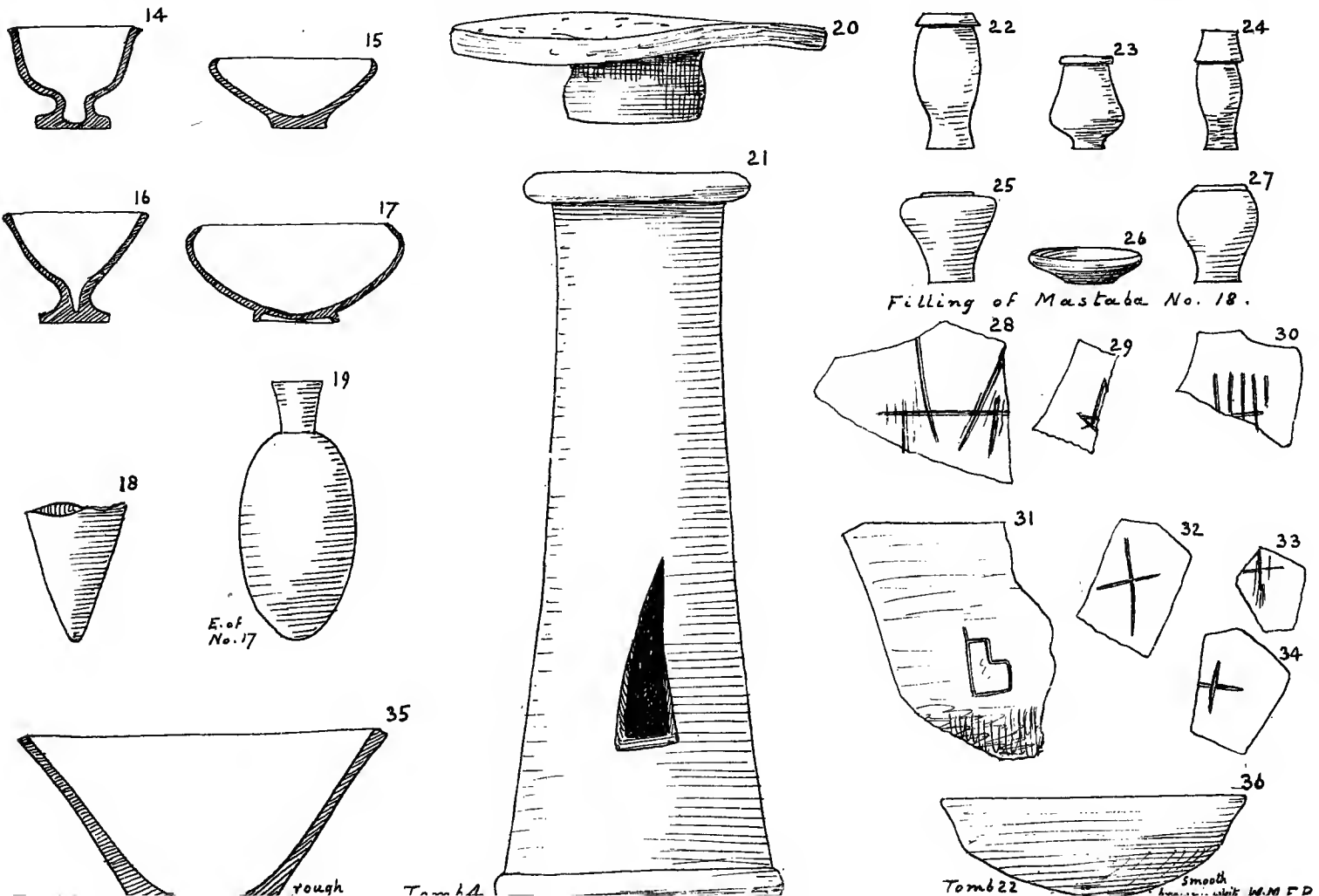




Tomb No. 24



Tomb No. 27 North hole.



Filling of Mastaba No. 18.

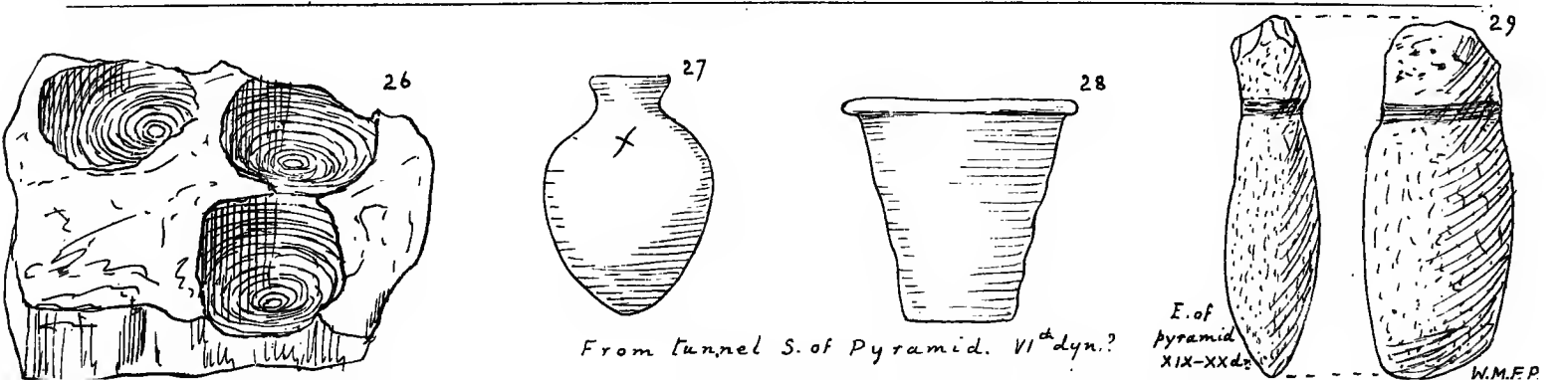
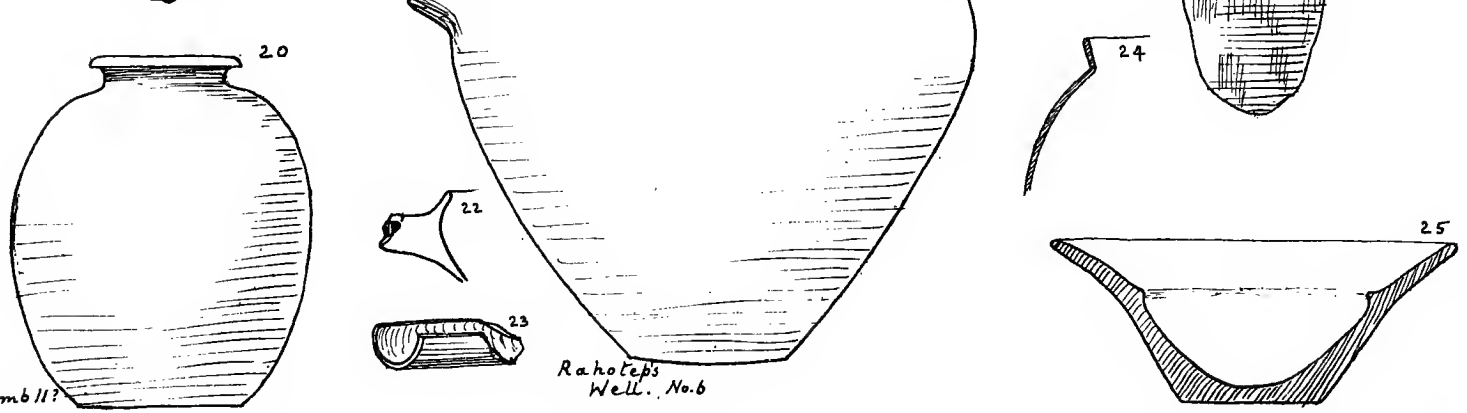
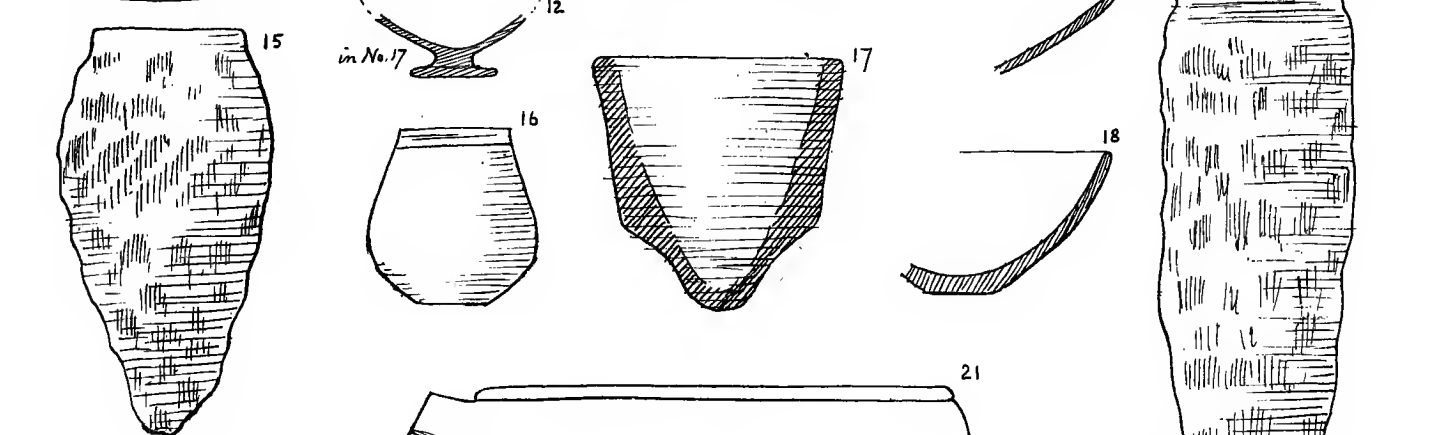
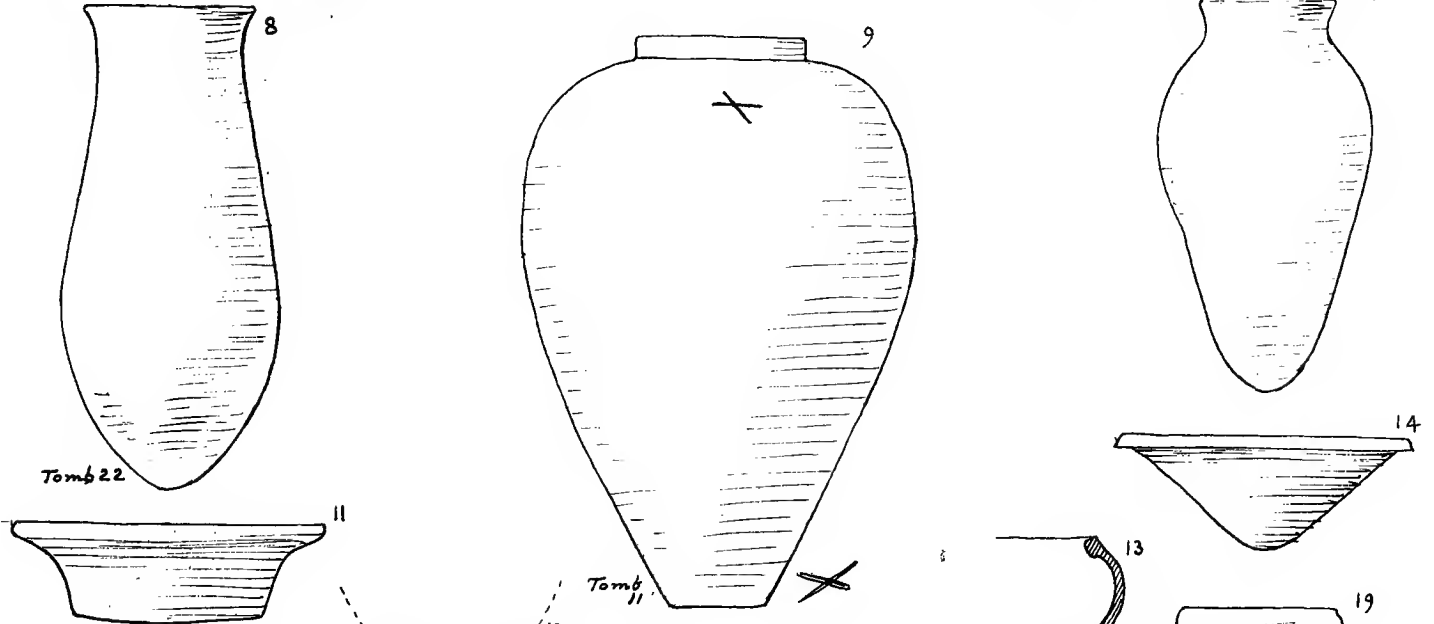
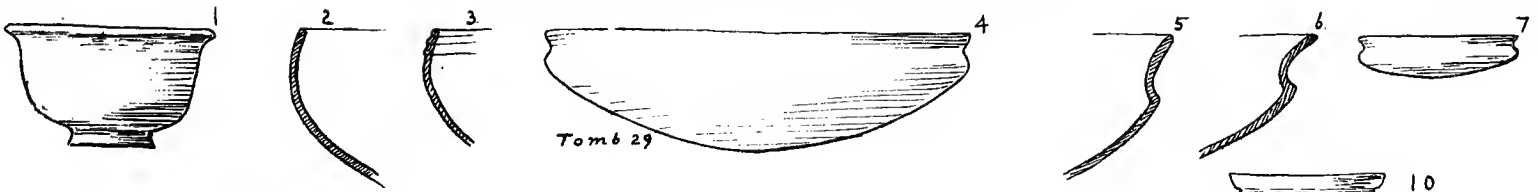
E. of No. 17

Tomb 24

Tomb 22

Smooth  
hard drab  
W.M.F.D.





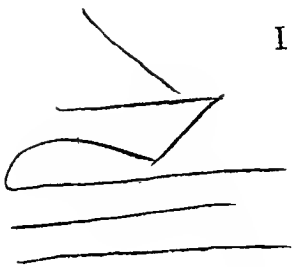
From tunnel S. of Pyramid. VI<sup>th</sup> dyn.?

E. of Pyramid XIX-XXd?





I N.E. corner of chamber

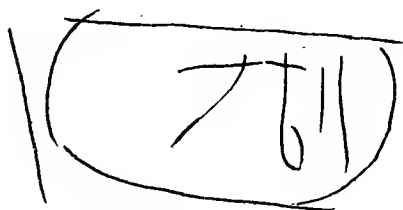
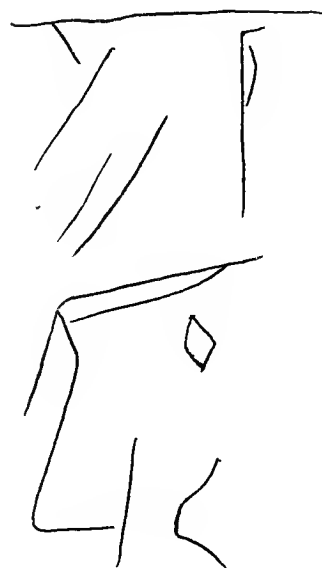
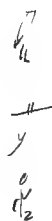
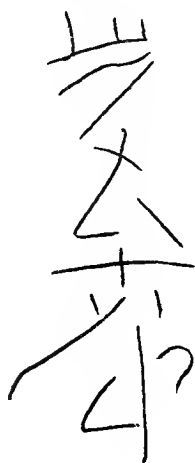
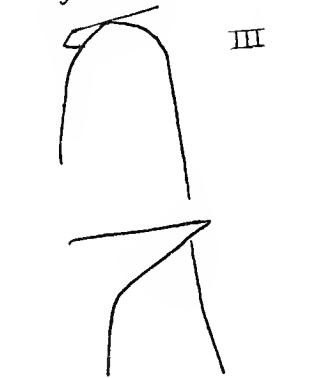


E. wall of chamber, facing court.

3:5

II

III



South wall of entrance

IV.

3:5





1  
 2  
 3  
 4  
 5  
 6  
 7  
 8  
 9  
 10  
 11  
 12  
 13  
 14  
 15  
 16  
 17  
 18  
 19

1 Inscr 41.

2 unvollst. und unklar  
mit Ra in final  
Griffel 1/2 1/2 5/2

3 1/2 unvollst. und unklar

4 1/2 unvollst. und unklar

5 unvollst. und unklar

6 1/2 unvollst. und unklar

7 1/2 unvollst. und unklar

8 1/2 unvollst. und unklar  
mit (P 5)

9 1/2 unvollst. und unklar  
1/2 unvollst. und unklar

10 1/2 unvollst. und unklar

11

12

13 1/2 unvollst. und unklar  
1/2 unvollst. und unklar

14 1/2 unvollst. und unklar  
1/2 unvollst. und unklar

15 1/2 unvollst. und unklar

16 1/2 unvollst. und unklar  
1/2 unvollst. und unklar

17 1/2 unvollst. und unklar

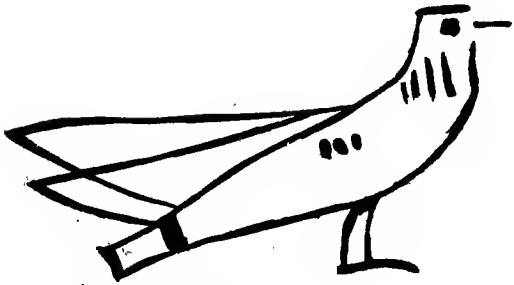
18 1/2 unvollst. und unklar  
1/2 unvollst. und unklar

19 1/2 unvollst. und unklar

best of  
 my  
 you  
 1000  
 1000  
 nach dem  
 Goll  
 Inscr  
 Ka  
 (1/2 unvollst. und unklar)  
 1/2 unvollst. und unklar  
 nach dem



VI



IIIIIIIIII

2

1

2

3

4

5

6

7

8

9

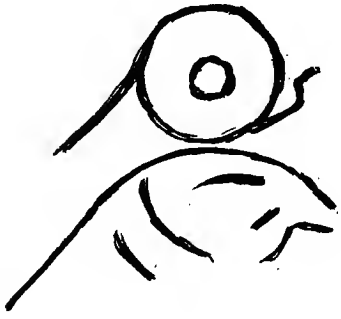
10

11

12

13

VII



long lines, mostly last

1

2

3

last { 4 5

IX

1  
2  
3

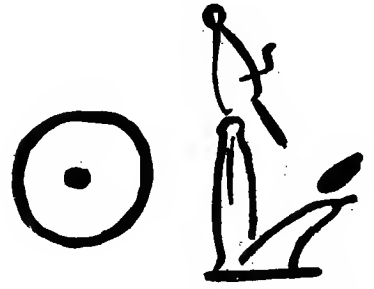
} on roof of door.

X

Large stylized hieroglyphic characters.

XI

Large stylized hieroglyphic characters.







XII

1  
2  
3  
4  
5  
6-10 quite illegible

XIII

Vertical column of hieroglyphs on the left side of section XIII.

1  
2  
3  
4  
end

*arche des d'egre de mmm*  
*Joint*  
*finis m gas*  
*end*  
*rele neu of le seu*  
*delan des m*

XIV

XV

1

XVI

2  
3  
4  
5

2  
end





(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50) (51) (52) (53) (54) (55) (56) (57) (58) (59) (60) (61) (62) (63) (64) (65) (66) (67) (68) (69) (70) (71) (72) (73) (74) (75) (76) (77) (78) (79) (80) (81) (82) (83) (84) (85) (86) (87) (88) (89) (90) (91) (92) (93) (94) (95) (96) (97) (98) (99) (100)

1  
 Def 30  
 Amenhotep III  
 Def 30 Def 30  
 2  
 Def 30 Def 30  
 3  
 Def 30 Def 30  
 4  
 Def 30 Def 30  
 5  
 Def 30 Def 30  
 Def 30 Def 30

XVIII

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50) (51) (52) (53) (54) (55) (56) (57) (58) (59) (60) (61) (62) (63) (64) (65) (66) (67) (68) (69) (70) (71) (72) (73) (74) (75) (76) (77) (78) (79) (80) (81) (82) (83) (84) (85) (86) (87) (88) (89) (90) (91) (92) (93) (94) (95) (96) (97) (98) (99) (100)

1 Def 30 Amenhotep III  
 Def 30 Amenhotep III  
 2 Def 30  
 Amenhotep III Def 30 Def 30  
 3 Def 30 Def 30  
 Def 30 Def 30  
 4 Def 30 Def 30  
 Def 30 Def 30

At extreme top of wall.

Trial of signs, isolated: preliminary to writing V.1.

1 2 3 4 5 6 7 XIX  
 (1) (2) (3) (4) (5) (6) (7)

XX  
 (1) (2)









