

## MAJOR KITCHENER'S REPORT.

On the 10th of November, 1883, the party left Suez for the camp at 'Ayûn Mûsa. I was able to compare chronometers at the Eastern Telegraph ship on the way out of the harbour.

The small oasis called the Ayûn Mûsa has been fully described in guide books, and Baedeker gives an enlarged plan of the locality with the heights of the springs in detail.

The place consists of a few springs of limpid but brackish water, small pools with gardens of palms and tamarisks around them, as well as beds of vegetables and culinary herbs.

These gardens are kept by a Frenchman and some Arabs, who have provided summer-houses for the convenience of those who resort thither from Suez to enjoy the fresh desert air.

They form the market gardens from which the vegetable supply of Suez is principally drawn. There exists also a solitary pool upon the top of a neighbouring hill of sand, having one single palm beside it.

While camped there I went over my stores and instruments, and took some astronomical observations to see that all were in proper order for the start.

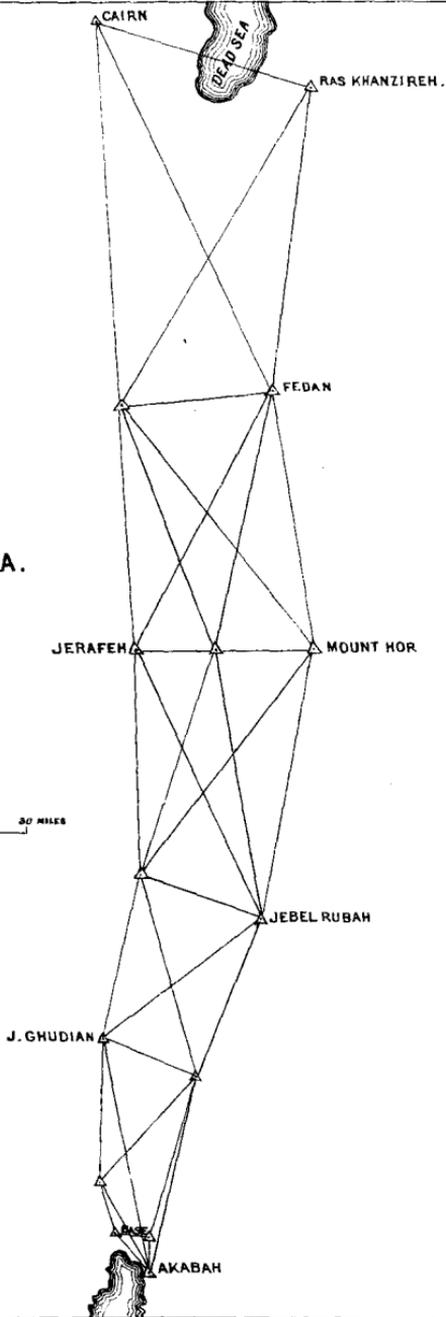
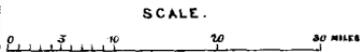
On the 12th November, camp was moved to Wâdy Sudur; the route was over an open plain by the sea-shore with a line of cliffs supporting the Tih plateau, about ten miles to the east. Torrents from these cliffs had covered the ground in many places with rocks and boulders. These torrents are extremely short-lived, coming down in force when any rain falls, and drying up almost as quickly. When it ceases, they spread themselves over the plain in many shallow channels, covering a large area with stones and *débris*. One had come down Wâdy Sudur about ten days before, and the traces of wet mud, &c., were still visible over the plain. This wâdy has become famous for the tragedy enacted in August, 1882, when Professor Palmer, Captain Gill, and Lieutenant Charrington were murdered here.

I obtained from an Arab of the Haiwat tribe a story of the murder which I have never seen published in any account of it. I give it merely for what it is worth: Arabs, as everybody knows who has had to do with them, have a remarkable facility for making up a story to meet a supposed occasion.

This was the story in the Arab's own words:—

“Arabi Pashi, directed by the Evil One—may he never rest in peace!—sent to his lordship the Governor of Nakhl to tell him that he had utterly destroyed all the Christian ships of war at Alexandria and Suez; also that he had destroyed their houses in the same places, and that the Governor of Nakhl was to take care if he saw any Christians running about in his country, like rats with no holes, that the Arabs were to finish them at once. On hearing this news, a party of Arabs started to loot 'Ayûn Mûsa and Suez. Coming down Wâdy Sudur they met the great Sheikh Abdullah

DIAGRAM  
 OF  
 TRIANGULATION  
 OF  
 SURVEY.  
 AKABAH TO DEAD SEA.



*Drawn by G. Armstrong*

and his party ; they thought they were the Christians spoken of by Arabi Pasha, running away, so they surrounded them in the wâdy. But the Arabs ran away from the English, who defended themselves in the wâdy ; all night they stopped round them, but did not dare to take them till just at dawn, when they made a rush on them from every side and seized them all.

“The Arab Sheikh, who had come with the party, ran away with the money. The Arabs did not know Sheikh Abdullah, and did not believe his statement, and when he offered money, his own Sheikh would not give it, so they believed that the party were running away from Suez, and they finished them there. Afterwards the great Colonel came and caught them, and they were finished at Zag ez Zig. May their graves be defiled !”

Such is the story I heard, and there seems to me to be some amount of truth in it.

Colonel Sir Charles Warren's energetic action in the capture and bringing to justice of the perpetrators of the crime, has created a deep impression, and I consider that the whole peninsula is for foreign travellers now as safe as, if not safer than, it was previously. While on this subject I may mention that I found Professor Palmer's death everywhere regretted deeply by the people, and his memory still warm in the hearts of his Arab friends in the country. Many of them came unsolicited to ask me if I had known him, and to express their sorrow at his loss.

From the length and breadth of Wâdy Sudur I should imagine it must drain a considerable area on the Tih plateau. The existing maps appeared to me to be wrong after Sinn el Bisher, or Jebel Bisher, as the true scarp appears to recede considerably. I was unable, however, to prove these points, but if a map were made of this part it would probably show considerable variation of the existing plans.

The tract after Wâdy Sudur passes over more rolling country to Wâdy Ghurundel, where we camped for the second night ; the wâdy flows between banks, and is of considerable importance, and drains an extensive country broken up by high hills ; on the edge of the Tih scarp there are springs and some trees in the valley.

Wâdy Ghurundel forms the boundary of the Ordnance Survey, so that from this point to Jebel Mûsa the map was complete. I was able to sketch in some features on the border of the finished Survey while passing.

Our route led through Wâdy Humrah, Wâdy Nasb, Wâdy Kamileh, from which Armstrong and I visited the temple at el Sarâbit el Khâdim.

The sandstone columns and tablets are in many cases in an excellent state of preservation, and the hieroglyphics were in many cases almost as sharp and perfect as when first cut ; others were very much weathered, some tablets 7 feet 6 inches high, by 2 feet wide, and 1 foot 6 inches thick, and rounded at the top like the Moabite Stone, appeared to me to deserve a better fate than being left to perish from the effects of the weather and the vandalism of the Arabs. Excavations here would, I think, reveal many interesting points connected with the Egyptian occupation of this country at the time of the Exodus. I noticed that the artist had been

inspired by his surroundings ; engraving the Ibez in different positions to form ornamental patterns round the hieroglyphic inscriptions. There were several stations on the surrounding hills where tablets stood, similar to the one described ; but these have been mostly thrown down and broken up.

[The following description of Sarâbit el Khâdim is given by the late Professor Palmer, in his book, "The Desert of the Exodus."

"Although only 700 feet in height, the ascent of Sarâbit el Khâdim is by no means easy.

"A scramble over a rough slide of loose sandstone at the upper end of the valley, a treacherous sloping ledge of rock overhanging an awkward precipice, and a steep ravine which brings into play all one's gymnastic capabilities, leads to an extensive plateau broken up by many deep ravines and rising knolls. On one of the highest of these last is a heap of ruins—hewn sandstone walls, with broken columns, and numerous stelæ, in shape like ordinary English gravestones, standing or scattered at irregular intervals about the place, the whole being surrounded by the *débris* of an outer wall.

"The building consists of two temples, apparently of different dates—one constructed entirely of hewn stones, the other formed by two chambers excavated in the rock at the easternmost end, and having a walled continuation in front. In the largest of these chambers the walls show signs of having been once completely covered with hieroglyphics, though a great portion have now scaled off ; at the upper end is a small niche, probably the altar, beside which is carved a figure in bas-relief. Another niche is seen at the right-hand corner, and in the centre of the chamber is a pillar, cut in the solid rock and covered with hieroglyphics. Some of the hieroglyphics in this cave still bear traces of the paint with which they were formerly ornamented—emerald green inside the characters, with a red and black band above and below.

"The cornice of the wall which forms the continuation of the temple is ornamented with a pretty pattern, and fragments of Egyptian coping lie around the entrance.

"The *stelæ* above mentioned, as well as such of the walls of the building as are still left standing, are also covered with hieroglyphics, and amongst them may be remarked the *cartouches* of many of the earliest Egyptian kings.

"The purpose of these monuments was for a long time enveloped in mystery, but the researches of Professor Lepsius and other learned Egyptologists have shown that they were connected with the working of copper mines in the neighbourhood, and that the temple was probably that in which the miners and their guards worshipped the national gods of Egypt.

"The mines themselves were first rediscovered by Mr. Holland, during a previous visit to the peninsula, and were carefully examined by the Expedition on this occasion ; they exist in great numbers in the neighbourhood of the temple, and several of them contain beautifully executed hieroglyphic tablets.

"From the inscriptions and cartouches found there, it is evident that the mines were in full working order at the time of the Exodus.

"There is another means of access to the ruins of Sarâbit el Khâdim, by a ravine rather higher up the main valley, which involves a less toilsome climb; but as it also necessitates a walk along a narrow sloping ledge of rock, with a terrific precipice beneath, I cannot recommend it to the traveller unless he feels confident in the possession of a sure foot and a steady head.

"The name Sarâbit el Khâdim signifies 'the Heights of the Servant,' and the place is said by the Arabs to have been so called from a black statue, representing a 'servant or slave,' which was removed 'by the French' during their occupation of Egypt. Amongst the ruins we noticed a pedestal, which might have served for the base of such a statue; and I have since seen in the British Museum a beautifully executed female foot, carved in black stone, which formed part of the collection of curiosities found by the late Major Macdonald in this very spot.

"It is not unlikely that amidst the antiquities in the Louvre, the remaining portion of the 'Khâdim' from Sarâbit may yet be found.

"The hieroglyphic inscriptions from Maghârah range from Senefru of the third Egyptian dynasty to Thothmes III, of the eighteenth line; those of Sarâbit el Khâdim end with Rameses IV, of the twentieth, after which period the mines and temples were abandoned. No inscriptions have been discovered at Sarâbit of kings who reigned between Thothmes III and the twelfth dynasty, nor any after the twentieth. They occur rarely and after long intervals after Rameses II.

"One of the principal tablets at Sarâbit el Khâdim refers to a certain Har-ur-ra, superintendent of the mines, who arrived there in the month Phamenoth, in the reign of some monarch not mentioned, probably of the twelfth dynasty. The author of the inscription declares that he never once left the mine; he exhorts the chiefs to go there also, and 'if your faces fail,' says he, 'the goddess Athor will give you her arms to aid you in the work. Behold me, how I tarried there after I had left Egypt,—my face sweated, my blood grew hot, I ordered the workmen daily, and said unto them, there is still turquoise in the mine and the vein will be found in time. And it was so; the vein was found at last, and the mine yielded well. When I came to this land, aided by the king's genii, I began to labour strenuously. The troops came and entirely occupied it, so that none escaped therefrom. My face grew not frightened at the work, I toiled cheerfully; I brought abundance—yea, abundance of turquoise, and obtained yet more by search. I did not miss a single vein.'

"Another inscription runs:—'I came to the mines of my lord, I commenced working the Mafka, or turquoise, at the rate of fifteen men daily. Never was like done in the reign of Senefru the justified.' These and the frequent recurrence of tablets representing the various kings triumphing over and slaying their foreign captives, will enable the reader to judge of the nature of the mines and the manner in which they were worked by their Egyptian discoverers."]

On the morning of the 18th I took observations with the theodolite from Zibb el Baheir (a trigonometrical station of the Ordnance Survey), over the district to the north-east through which we were to pass, also into Jebel el Watiyeh, on the edge of the Ordnance map, which was formed into a trigonometrical station by observing with the theodolite from it, subsequently observing from Jebel Mûsa. I was thus able to fix many points in the country we were about to survey from a very extended base of Ordnance survey work.

On the 22nd November we left the surveyed country at El Watiyeh, and I made a detour by 'Ain el Akhdar, which I was able to fix; the spring is of good water, and is perennial, with a few palms and other trees hidden in the corner of the valley. I then made my way across low-lying hills at the foot of outlying scarp, to the Wâdy Zelakâ, where camp was pitched.

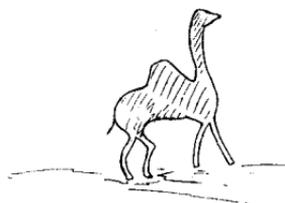
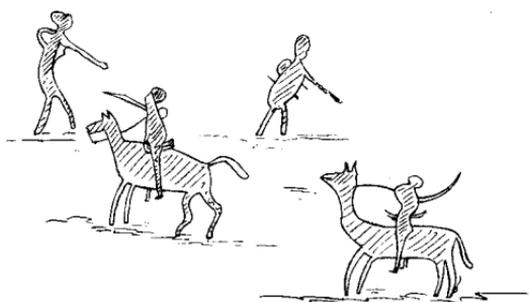
Next day our road led down Wâdy Zelakâ, which bends towards the east, about a mile from the camping ground; and where the bed of the valley opens out Armstrong came across a stone circle almost buried in the sand, the top of the stones only being visible. Striking across to the eastern side of the valley, where a detached piece of rock stands conspicuously out, he found some Arabic inscriptions and a lot of figures, chiefly animals, rather roughly carved out on the face of the rock. The valley, though bounded by steep cliffs, has an open, level, and wide bed, which is one of the principal features of the wâdies in all this region, making the passage of even very mountainous districts easy for animals and even possible for wheeled traffic. No valley of importance joins the wâdy from a continuous line of high hills with cliff, cutting off all communication up that side.

Camp was pitched at the end of this range of hills opposite the broad mouth of Wâdy Biar, where there is an open space with an isolated hill in the centre. Wâdy Abu Tareifeh here comes in from the south-west, joining Wâdy Ughelim from the south, and flows into Wâdy Zelaka; the valley here takes the name of Wâdy Biar, and after a few miles turns to the north at a point where there are some nâwâmîs.

These nâwâmîs are small round circles of stones, some of them built up into a dome shape, having a small entrance on one side; they are a great deal too small for human dwellings, and they are not, as far as one can judge, tombs. They occur in many places in the peninsula, and are generally in groups; there are usually some traces of ruined walls about. The entrance is not in any particular direction; the stones are small, and have not any appearance of having stood from very remote antiquity. I have never seen the question of their origin satisfactorily explained.

While travelling subsequently through the country to the south-east of Gaza on my way to Ismailia, I noticed the Arabs cultivating the ground extensively; they live, of course, entirely in tents, and the barley they grow is sent in to market, but the chopped straw is made up into numbers of small heaps on the ground and covered with earth, forming little domes exactly like the nâwâmîs. There are few stones on the Gaza plain, and

*Figures cut on the rock in Wady Zelakû*



*Copied by G. Armstrong.*

little earth to spare in the wâdies of the peninsula. I would suggest that they are stone houses of the Arabs when they cultivated these wâdies, probably not very long ago. I saw no traces of cultivation now, but there are many places that would repay the labour well ; and, as far as I can judge, nawâmîs are usually found not far from some spot of this sort.

The walls in the neighbourhood are the traces of the enclosures round the tents. I know that much has been written about these nawâmîs, but having no books of reference with me I submit this opinion with diffidence.

[The late Professor Palmer, along with Mr. Drake, visited these nawâmîs and groups of many others, and gives the following remarks in his book, "The Desert of the Exodus."

Professor Palmer thus describes them :—

"Shortly after passing 'Ain el 'Elyâ (Râs el 'Ain) we came to a group of nawâmîs, those quaint beehive huts of which I have before spoken.

"They stood on the hills to the east of the wâdy, and were more perfectly preserved than any which we had hitherto seen in the peninsula.

"They consisted of two detached houses, on separate hills, and a group of five on the side of a higher eminence. The first two had been used as Arab burial-places ; but of the second group at least three out of the five were apparently untouched.

"Their dimensions average 7 feet high by 8 feet in diameter inside. They were circular, with an oval top, the construction being precisely the same as that of the nawâmîs in Wâdy Hebrân, but the perfect condition in which they have been preserved exhibits in a much more striking degree the neatness and art of their builders. In the centre of each was a cist, and beside that a smaller hole, both roughly lined with stones ; these were covered with slabs of stone, over which earth had accumulated.

"Some human bones which we found in the cist at first led us to the conclusion that they were tombs ; but the small size of the cist, and the evident fact that they had never contained perfect skeletons, proved the idea to be erroneous. In the smaller cist the earth showed signs of having undergone the action of fire, and, in one or two, small pieces of charred bone and wood were found. The doors, which are about 2 feet square, are admirably constructed, with lintel and doorposts. All the stones used in the construction are so carefully selected as almost to give the appearance of being hewn, and those in some of the doors have certainly been worked, if not with any instrument, at least by being rubbed smooth with other stones.

"A flint arrow-head and some small shells were found in one of the nawâmîs. They are evidently dwelling-houses ; but I must leave to those who are better versed than I am in the science of prehistoric man the task of determining to what race they once belonged ; the remains are certainly some of the most interesting which I have met with in the East. The country all around is covered with them, every hillside having some remains of nawâmîs upon it ; but, owing to their exposed position, they

have none of them been preserved in so perfect a state as those just described. Close by the *nawâmîs* were some stone circles. There would seem to have been a large settlement of these people in the neighbourhood of 'Ain el 'Elyâ.

"The word *nâmûs* is not known beyond Sinai, the Arabs in other parts of the desert calling them merely *gusûr*, or castles."

After three miles the valley turns again abruptly to the east, and at the corner are the important springs of Râs el 'Ain (called 'Ain el 'Elya by Professor Palmer), surrounded by palm-trees; the water is good and plentiful, forming a small stream running towards a narrow passage (Es Sûk) in the granite hills; this does not at all prepare the traveller for the grand gorge he has a few steps ahead of him. On entering Es Sûk the cliffs close in on both sides, forming every combination of turn and bend, and running up to about 800 feet with sheer precipitous sides; every turn increases the height and grandeur of the gorge, while the small stream keeps the place cool and green with many plants and shrubs. Careful traversing had to be adopted through the gorge, which extends four miles.

Camp was pitched beyond the gorge, where another spring occurs called Ain el Akari, watering a small patch of reeds and palms. I had to observe from several high points on either side of the gorge in order to carry on the continuity of my observations.

On the 26th camp was moved. After passing through narrow valleys surrounded by granite hills, the road emerged opposite Jebel 'Aradeh, a high mountain of white limestone, which had to be ascended for observation. In the open portion of the valley there is a well of good water, having a perennial supply, called Bir es Saura: it occurs in a small cave. This well was said to belong to the Terabin tribe of Arabs, but I could not find out that any of them ever came here, and it is certainly detached from their main possessions to the north and west of Nakhî.

The broad valley up which we travelled changes its name frequently as it passes each locality: thus in a few hours it becomes Wâdy 'Aradeh near the Jebel 'Aradeh, Wâdy 'Attiyeh opposite the tomb of the Sheikh of that name, and Wâdy Herteh at Jebel Herteh where we camped.

To the west of Wâdy Herteh the country is much broken up by small hills and valleys. The valley itself is large and open. After bending to the east and passing between some hills it again changes its name and becomes Wâdy el Hessy, which name it retains to its source. There is a small well in Wâdy Hessy, called 'Ain Hamâti, with a scanty supply of water.

The route continues in Wâdy Hessy, which gradually opens out on to an extensive plain; crossing the plain to the north the watershed is reached: it is formed of low hills with a descent of a few hundred feet to a lower plain on the north. On the west is the range of hills called Turf er Rukm, running out into the plain as far as the Haj road, ending in abrupt cliffs. A broad valley leads away to the north called Wâdy Shiah, joining eventually the Wâdy Jerafeh, and thus falling into Wâdy 'Arabah and the Dead Sea. To the east of this valley are the granite hills of Jebel Humra

jutting up in innumerable sharp peaks. The Derb el Haj runs immediately south of the Jebel Humra, through an open plain which is bounded on the south by a line of cliffs running east from the watershed. We passed along the plain and camped above the Nukb, or descent to the Gulf of 'Akabah.

The Derb el Haj descends about 2,000 feet to the plain of 'Akabah, by a carefully constructed road; the rock had to be considerably excavated in places, and bridges span the watercourses when necessary. A carriage could be driven down the descent without much risk; the road winds down a steep hillside for the first mile, and then descends by a valley through granite hills to the plain below. Before descending I had to make a long detour in order to obtain a good station to observe from, and I was fortunate in finding a point from which I had a splendid view of the Wâdy 'Arabah, which became afterwards one of my trigonometrical stations when passing up the valley.

The Admiralty Survey does not correctly give the form of the head of the bay, which is not so pointed as shown. At the lowest part of the valley the soil is soft and loamy; the remainder of the broad bed is sand and *débris* from the hills.

The castle of 'Akabah is an extensive but ruined building situated close by the sea-shore on the eastern side of the bay, and is surrounded by a few wretched hovels and extensive groves of palm-trees along the shore. It is the abode of an Egyptian Governor, who has a few soldiers at his disposal, and is considered an important station on the Egyptian Haj road. There is practically no trade in the place, as ships never come there. The bay contains sharks and numerous other fish.

#### 'AKABAH TO THE DEAD SEA.

The party had to remain three days at 'Akabah, while arrangements were being made with Sheikh Muhammed Ibn Jad, of the 'Allawîn Arab tribe, to take us up the Wâdy 'Arabah.

During this period I was fully occupied measuring a base line on the plain and starting the triangulation of the valley. I was also able to survey some portion of the shore line and hills about 'Akabah, which were not correctly laid down on the Admiralty plan. I measured the base line completely across the valley: its length was 233·86 chains. A point close to the castle of 'Akabah was observed for the vertical angles, and the system employed for extending the triangulation up the valley can best be seen from the attached diagram of triangulation. The Sheikh Muhammed Ibn Jad declared that he could only take us as far as Petra, and that from there we should be obliged to strike across country to Gaza.

On the 3rd December we left 'Akabah, shortly followed by another party, who had been sent out by some company to ascertain the height of the watershed above the sea, by a line of levels from 'Akabah.

About a mile from the sea, north-east corner of the bay Armstrong observed a number of small mounds similar to what are usually found on old sites;

fragments of pottery of various colours are found, and an old wall of masonry is seen cropping out here and there.

The general features of the valley are well known. On the east are the bold granite mountains of Midian, intersected by valleys that have thrown out a mass of *débris* into the main valley, forming a semicircular fan-like ramp up to the mouth of each wâdy ; these are very marked, and when seen from the opposite side of the valley have a very curious effect.

On the west limestone cliffs form a continuous scarp, broken at places and intersected by granite upheavals ; very few important wâdies join the valley on this side, although there are naturally many small ones from the scarp itself. Camp was pitched near Ed Deffieh, some brackish pools of water in the muddy slime that formed the lower portion of the valley ; some rain that had fallen while we were at 'Akabah increased the difficulty of passing this sticky mud.

Next day we passed Wâdy el Mâne'âieh, flowing from the west, and forming a picturesque recess in the scarp of the western side of the valley, with a granite outbreak closing the entrance. The limestone scarp then continues regularly. I had to visit a high prominent point upon it, to take observations, and from here for the first time I saw and observed into Mount Hor. The ascent of the scarp was a stiff climb of 1,500 feet.

Camp was pitched near the border of the marsh of Et Tâbâ.

Et Tâbâ is a considerable marsh of mud and rushes, extending the whole width of the bed of the valley. There is a passage round it on either side ; the western one leads by 'Ain Ghudian, while the eastern road passes 'Ain Tâbâ, where there are palm-trees, and pools of water and reeds ; to the north of the marsh begin the blown sand dunes with a few scattered palms.

At the north-west extremity of the marsh a spur runs out from the western scarp for three miles, and under it is the 'Ain Ghudian ; there is a pool of water, and several wells giving a plentiful supply of good water.

I found the foundations of a rectangular building, about 20 yards square ; there were also tracks of ancient lines of wells converging from the hills on to the 'Ain, and an Arab graveyard that has been noted before. I saw no traces of a Roman road.

To the north of 'Ain el Ghudian the centre of the valley is choked with sand, leaving a passage on either side.

The hills on the east decrease in height, giving place to limestone and sandstone hills, joining a high range in the background called Jebel Serbal ; the scarp on the western side continues regularly with no wâdies of importance breaking through ; there are several minor valleys. Camp was pitched at the mouth of one of those, called Wâdy Galaita.

Next day I had again to ascend to the top of a prominent point on the western scarp near Wâdy el Beiyaneh, from which a good round of angles were observed ; just below the point there appeared to be a small watershed ; the water channel from the eastern side comes across the valley and flows to the south down the western side, while the valleys from the hill I was on appeared to me to flow north ; it was so late and dark when I got

down from the point I was on, that I was not able to examine this point as closely as I should have liked, but my impression was that there is a small depression in the valley here which does not drain south, unless when a considerable flow of water from the north filled the depression, causing the water to overflow.

The western scarp falls away after the high point near Wâdy Beiyaneh, forming low rolling hills with large openings, through one of which the main road turns westward over the lowest portion of the watershed.

Camp was pitched in the centre of the valley, at the mouth of Wâdy Heyirim, four miles south-east of the lowest point of the watershed.

To the south-east of the camp Wâdy Ghurundul joins the Wâdy Arabah; this valley breaks through a narrow and romantic gorge, and has a good supply of water at 'Ain Ghurundul, situated some distance up the valley.

Next day I made an excursion to the west, surveying the low hills and the lowest portion of the watershed, which is on an open plain dividing Wâdy 'Arabah from Wâdy Jerafeh, flowing north from a south-westerly direction after the opening to the low watershed. A low line of cliffs running north-north-east commences on the western side of Wâdy 'Arabah, separating it completely from the Wâdy Jerafeh; I walked along these hills, called Er Rishy, until I reached the watershed of the main valley at the mouth of Wâdy Huwer, flowing from the east. This watershed is 320 feet higher than the other, and is the commencement of the great valley flowing south up which we had come.

The watershed is curiously formed--just at the mouth of this wâdy, part of the waters of which run north and part south. Those running north are joined by several wâdies from the Mount Hor range, and after passing the end of the low range of hills separating the valley here in an easterly direction, join the big valley of Wâdy Jerafeh or Wâdy el Jeib.

Armstrong found a ruined building in the valley. It measured 102 feet square, with well-cut drafted masonry. The building did not appear to date prior to Saracenic times--very probably one of the old road stations on the highway to 'Akabah.

Camp was pitched in Wâdy Abu Rusheibeh.

The eastern hills here recede, leaving a sort of amphitheatre in front of Jebel Harûn, the Mount Hor of Scripture, which rises magnificently in the centre. There is a mountain of white limestone immediately south of Mount Hor, over which it towers and gains by the contrast of its dark red hue over the white. Looking thus at Mount Hor from the south it appears to rise in several pinnacles, the highest of which is surrounded by a glistening white dome covering the tomb of the patriarch Aaron.

The scenery is exceptionally fine, and I do not consider former writers have exaggerated the grand appearance of Mount Hor; the brilliant colours of the rocks have been remarked by all travellers, but surpassed what I expected to find.

As I had been observing into the dome of Mount Hor for some time I was very anxious to complete my observations by obtaining a round of

angles from there. Next morning therefore an attempt was made to go up without warning the Arabs, as had been done by Palmer and Drake ; but this was frustrated, as I expected, by the Arabs having heard of our coming, and being on the alert. Two parties of our size travelling up Wâdy 'Arabah cannot do so without being remarked and making a sensation. We, however, penetrated up the valley leading to Petra for some distance, and noticed remains of terraces and some buildings on the slope.

We camped at the mouth of the wâdy that evening, and next morning was spent in discussion with the Arabs as to the amount for which they would take us to Mount Hor and Petra. As we could not come to terms, camp was moved in the afternoon towards the Wâdy 'Arabah and pitched in Wâdy Harûn. The Arabs then gave way and acceded to the terms we had stipulated for. Next morning we started before daylight and returned to the ruins we had visited before ; from thence we ascended by a steep zig-zag path to a saddle on the Mount Hor range. Passing along a slightly descending ridge we soon came to the base of a mountain rising from the ridge : this is Mount Hor, being actually from this side a mountain on a mountain, though, from the north the descent is much more precipitous to a far lower level. Unfortunately, the morning was exceptionally hazy, so that it was difficult to distinguish surrounding features.

An old path, similar to that on Jebel Mûsa, with worn steps made out of boulders at difficult parts, led up the mountain to another level space or platform, from which the highest peak rises abruptly. Passing over some ruined arches on an ancient cistern or building, the path leads up steeply by steps cut out of the rock itself to the summit, where there is the usual little round dome on a square building covering the tomb of the patriarch Aaron. Looking inside, one saw the usual carpet covered cenotaph, with some ostrich eggs hanging over it—all in an uncared-for condition. We had to wait some hours on the summit owing to the mist which hung in dense clouds about us until 12 o'clock, when it partially cleared, and I was able to take some observations which were necessary for extending the triangulation to the north. After observing, we made our way rapidly down to Petra, and were able to visit the ruins and the more important tombs. There was no time to make a thorough investigation, but I was able to verify the accuracy of Laborde's plan of the place, and was much struck with the stupendous works in rock-cutting that had been undertaken and executed with the nicest accuracy ; also with the immense number of tombs, the ornamentations being as fresh and clear as when first cut, particularly those at Pharaoh's treasures. The colours of the rocks are wonderfully variegated, and most brilliant ; red to purple and blue are the most predominant colours, and these are set off by a cold grey background of limestone hills.

The ruins and tombs would doubtless well repay a thorough investigation.

It was dark when we got to the pas we had come up at dawn in the morning, and we reached camp about 9 P.M. after a long day.

Arrangements having been made with the Sheikh of our party to take

us to the Dead Sea next morning, we started down the eastern side of Wády 'Arabah instead of crossing to the opposite side, as we should have done had our original route to Gaza been maintained.

I went across myself in order to take observations from the other side of the valley, as well as to survey the detail. The valley is here about ten miles broad; the main water channel runs down the western side, and takes the name of Wády el Jeib with the main course alongside.

The hills on the western side are low, and much weathered, being of a soft, easily disintegrated limestone. It was late when I found the camp on the eastern side of the valley, and under the circumstances of camp moving continuously along the eastern side of the valley, I was compelled to give up attempting to do the western side, as it was quite beyond the power of myself and camel. I regret therefore that there is here an unsurveyed gap in the work.

Camp was moved next day to 'Ayûn Abu Werideh, or Buweirdeh; it was impossible to find out the exact name, as the Arabs themselves were divided on the subject. I am inclined to think Buweirdeh is the correct name. It is almost impossible to collect the correct nomenclature when travelling so rapidly through a country, with Arabs from a different district, and though I took every means in my power to determine the names definitely, I am not at all confident that in all cases I have obtained the correct names, or nearly as many as might be collected by a more prolonged visit to the neighbourhood. A good deal of blown sand from sand dunes in the valley lead up to the springs which break out in several places from some soft loamy soil in the valley, and form several small streams full of reeds, tamarisk, bushes, and palms, &c.; the water is slightly brackish.

Near the springs Armstrong observed terraces of an old town of considerable extent. There are numerous little mounds of artificial appearance; fragments of coloured pottery abound. The foundation of a building is seen, the stones having a very old and time-worn look, and portions of an aqueduct, level with the ground, are traceable from one of the springs leading to the site.

Next day I was able to obtain good observations from Samrat ez Feidan, from which the Lisan in the Dead Sea was clearly visible.

A considerable perennial stream of water runs down Wády Feidan, only losing itself when the valley opens on the plain of Wády 'Arabah. Doubtless the plain east of Jebel Feidan was a most fertile garden in former times, and it would take very little to make it so again. I have rarely seen a spot more suitable for every sort of culture, yet it is now a barren waste, and until the Arabs of this country are placed under some control it doubtless must remain so. The wooded mountains to the east about the ancient Dhana form a picturesque background; the ruins of this town, I was informed, were as interesting as those at Petra, with carving in rocks, &c.

Camp was pitched near the mouth of Wády Guweibeh, and I was extremely glad to find that a day's halt was to be made in this locality.

Next day, by starting early, I was able to visit the western side of the valley, a distance of twelve-and-a-half miles; I observed with theodolite from a trigonometrical station on the hills beyond Wâdy Jeib, and was able to take up the survey again on that side, thus making the gap unsurveyed as small as possible. Owing to the want of knowledge of the locality by my guide, I was unable to visit 'Ain Aeibeh, which I had much wished to do.

Armstrong explored the country towards the east, and found, six miles north-east of Feidan, the ruins of a small town in a valley, surrounded by bold and precipitous cliffs; the ruined walls are from a foot to 3 feet high, the stones roughly squared, and of no great size; some black heaps resembling slag heaps point out that very probably ancient mines may be found in the neighbourhood. A path leads from Wâdy 'Arabah to this valley, crossing the watershed into Wâdy Ghuweir, where it joins, leading up the valley in a south-easterly direction, a beaten and well-worn track: this was probably the pilgrimage road from Gaza to Mecca. Lower down in the wâdy (Wâdy Ghuweir) are numerous springs of sweet water trickling out of the bed of the wâdy; and in a narrow gorge the rocks are literally covered with Bedouin tribe marks, Arabic inscriptions, &c., the work of pilgrims on their way to Mecca.

Next day was unfortunately extremely hazy, and for the three following days it was impossible to distinguish the western side of the valley at all.

We were not able to proceed a full day's march owing to the intrigues of the Arabs.

Camp was pitched at Ed Debbeh close to the descent to the ghôr. We passed a large ruined tank and remains of several buildings at the mouth of the Wâdy Utlah; these remains appeared to me to be of no great antiquity, and to date from after Crusading times. There is little doubt that all the eastern side of the valley was once a most fertile district, the streams of water in each valley being used to irrigate gardens and extensive cultivation, instead of running to waste on the hillsides, as shown by the remains of terraces which still exist almost perfect in many cases.

I heard many stories of the ruins and interesting country that lie to the east, which formed the ancient land of Edom, and I was frequently told that Wâdy Mûsa or Petra is not the most extensive ruin in that district.

The descent to the ghôr was down a sandy slope of 300 feet, and the change of climate was most marked, from the sandy desert to masses of tangled vegetation with streams of water running in all directions, birds fluttering from every tree, the whole country alive with life: nowhere have I seen so great and sudden a contrast.

The principal Sheikh of the Huweitât Bedouins, Sheikh 'Arâr, was camped close to the bottom of the descent, and he came out with some mounted men to meet us.

The country ruled over by Sheikh 'Arâr includes nearly the whole of ancient Edom, from Jebel Serbal to the ghôr where the Bedouins were camped; he is chief of the Bedouins who do not cultivate the ground. There are also several other small tribes of fellahin Arabs who cultivate the ground, and also acknowledge him as their chief; these fellahin are more

*Example of Bedouin tribe Marks and  
Arabic Inscriptions in Wâdy Chuweir.*

Handwritten Bedouin tribe marks consisting of several stylized symbols, including a cross-like shape, a triangle, and various geometric forms.

Handwritten Arabic inscription: *لبنان* (Libnan).

A collection of various Bedouin tribe marks and symbols, including a circle, a cross, and several complex geometric patterns.

Handwritten Arabic inscription: *١٢* (12).

Handwritten Arabic inscription: *١٢٣٤٥٦* (123456).

difficult to deal with than the Arabs themselves, having no law, and acknowledging no government. The only way to deal with them would be through Sheikh 'Arâr, who is a very respectable Sheikh, and to whom they have to pay tribute. The 'Allawîn Arabs under Sheikh Muhammed Ibn Jad rule the country to the south of Jebel Serbal and to the east of the Wâdy 'Arabah; they are closely allied to the Huweitât Arabs, and originally they say they were all one tribe. Even now the 'Allawin call themselves sometimes Huweitât; they are under the Egyptian Government, and are employed to protect the Haj road south of 'Akabah. Another branch of the same Arabs is the important tribe of Egyptian Huweitâts under Sheikh Ibrahim Ibn Shedid, whose influence extends over the tribes as far as 'Akabah.

These three Sheikhs rule over a very vast country; they are closely related by marriage, as the Arab Sheikh is very particular that his wife should be of noble blood, *i.e.*, of the family of the Sheikhs. They also recognise that they were originally of one tribe, although they are now completely independent of one another.

The next most important tribe is the Ma'azi Arabs; they rule over the mountains of Kerak, which they are said to have taken from Sheikh 'Arâr's Huweitât tribe. They say they are very numerous in the far East, and the three sections of the Huweitât all complain of the pushing nature of the Ma'azi on their frontiers. There is a large settlement of Ma'azi Arabs in Egypt, extending from Suez southwards along the Red Sea shore as far as Kosseir.

These Arabs everywhere have a bad character for thieving; they are divided up under numerous Sheikhs, and are continually making raids on the Arab tribes round them; they are generally very poor.

The only other two tribes of importance in this region are the Terabîn and the Taiyâhah; the latter are divided into two sections, the Taiyâhah and the Azazimeh. For many years the south country has been in a disturbed state, owing to the war going on between these two tribes; the dispute was about the boundary of the tribe lands near Bîr es Seba. Peace has now been obtained by the internal divisions of the Taiyâhah, a portion of whom have gone over to the Terabîn, the remainder having no heart to continue the conflict, although it may break out at any time.

The Taiyâhah have no friends or allies in any of the tribes around them, and have a feud with the great Huweitât family. The Terabîn, on the contrary, are at peace with their other neighbours; they cultivate the ground extensively about Gaza, and are closely allied to the Huweitât of Egypt. They bear a good character, and are a rich tribe.

The Terabîn rule the western portion of the south country, the Taiyâhah having the eastern portion as far as Wâdy 'Arabah.

The Haiwât are a small tribe occupying the country about the Haj road; they are ruled by Sheikh el 'Ayân Mismeh, who has his camp generally about Bîr etu Therned. Men of this tribe were the principal actors in the murder of Professor Palmer and his companions; they are a poor tribe, under the influence of Sheikh Shedid of Egypt.

Camp was pitched in the Ghur el Feifeh, near Wády Tufihel, and next day we moved on to the Ghôr es Safieh, where the Ghuwarneh were encamped. These are a wretched race of fellahin, who cultivate the Ghôr es Safieh, and are pillaged by the Huweitát from the south, the Ma'azi from the east, and the Taiyáhah from the west. They are the same race as those that occupy the ghôr at Jericho.

They were actually engaged in ploughing up their ground, which is well watered by the streams from Wády Safieh. Notwithstanding the constant blackmail they have to pay to different tribes they seemed to be well to do, and I believe make a good deal in trading with the Bedouins in barley, wheat, beans, &c. Owing to various causes we were obliged to stay in the Ghôr es Safieh until the 27th December.

The south end of the Dead Sea is formed of extensive mud flats of a very slimy character. The recent rains had doubtless contributed to the soft state of the mud, but the natives told me it was never hard. It was almost impossible to reach the edge of the water of the Dead Sea through the mud. A line of driftwood had been thrown up a considerable distance inland, forming a shore line almost half-a-mile south of the water's edge.

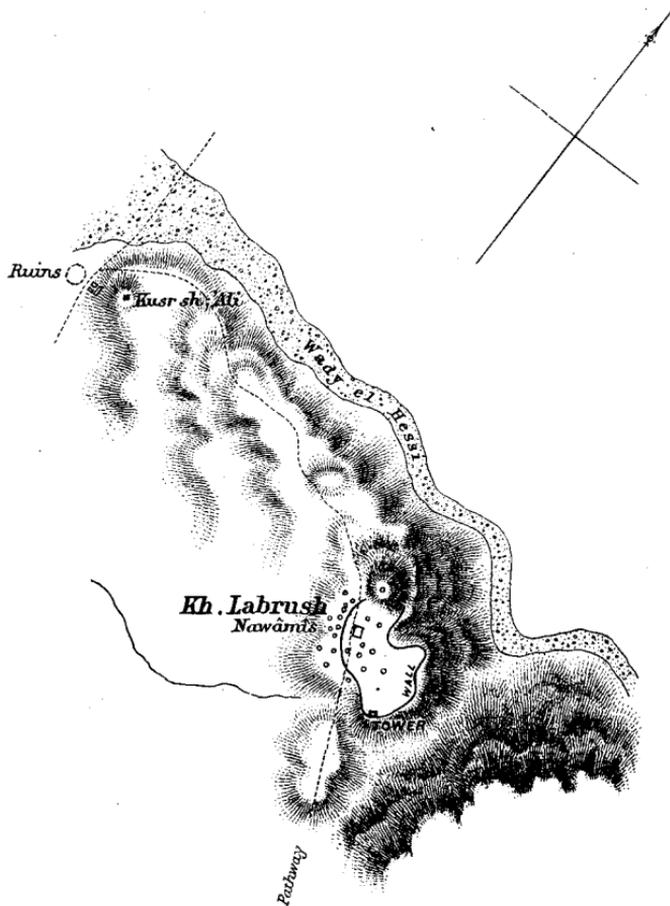
I found it was quite impossible to measure a base line through this slime, and the dense vegetation of the ghôr left no open space available. After several attempts I was obliged to relinquish the idea; this I regretted very much, as I found the portion of the Dead Sea to the south of the Lisan had been very inaccurately delineated on previous maps, and the Lisan itself had to be moved considerably, as will be seen on the plans.

I took several observations into the trigonometrical station on our old survey of Palestine, and was able to connect my triangulation up the Wády 'Arabah from 'Akabah in this way with very satisfactory results. The diagram of triangulation and plans will show the observations that were taken, and how the connection was established principally through the observations subsequently taken from a cairn on Rás Zuiweirah.

Overlooking the ghôr on the eastern side, just above the ruins of some modern mills at Kusr Sh. Ali, Mr. H. C. Hart, in his botanical rambles, found some very interesting ancient remains at a place called Khurbet Labrush. These remains consisted of a large number of nawâms, some of which were in a wonderfully perfect state of preservation. These nawâms are dotted about thickly over the site without any plan, and the openings in them having no especial direction; a few loose stone walls near some of them have the appearance of having been thrown up recently round tents. Enclosing the greater number of these nawâms is an ancient wall following the contour of the hill for a quarter of a mile; only the foundations remain, but they were of massive undressed masonry, of apparently remote antiquity. Inside the wall there are the ruins of an oblong building of similar masonry, very probably an ancient temple; unfortunately the remains are so ruined that it is impossible without considerable labour to thoroughly explore or measure this monument: only one corner could be determined, the remainder being covered by heaps of massive stone blocks.

There are several other heaps of ruins and large cairns of stones inside

SKETCH PLAN  
of  
KH. LABRUSH  
& NAWÂMÎS.



Scale  
0 100 200 400 600 800 1000 1200 1400 1600 yds.

the enclosure, but these are all detached and do not appear to be the remains of a town. I could see no extensive remains of buildings such as are found in ancient sites in Palestine.

The wall ran nearly north and south, and at the southern end there are the remains of what was probably a tower; traces of the wall can then be seen following the hillside for a considerable distance, and enclosing the hill. The nawâmis are not all inside the wall, and appear to me to be of more recent construction. An apparently old roadway leads through the ruins, and crossing a saddle of the hills leads up to the high hills on the east.

The remains appear to me to be those of a very ancient site subsequently used by the Arabs as a camping ground. I could find out nothing from the Arabs about these remains, though they are well known.

The view from here over the gorge of Es Safieh to the north is a very fine; the various and brilliant colours of the rocks are most marked; cliffs of a bright rose colour line the stream, alternating with yellow, dark red, and purple.

The ruins in the Ghôr es Safieh appear to be all modern; there is a large reservoir and several ruined mills, all of Arab construction.

A track across the mud flats leads to the base of Jebel Usdum, the mountain of salt, on the western side of the valley. I found that this mountain had to be considerably altered in shape and position to what it has been shown on existing maps. It is almost detached from the surrounding hills, and descends abruptly in cliffs to the Dead Sea shore. It reaches a height of 600 feet above the Dead Sea, and is broken and cracked by many fissures. All round the ghôr there is a border of the same marly hills, more or less washed away, and extending for some distance up the valleys.

On the 27th December we passed round the Jebel Usdum by the sea-shore and followed a road leading up the Wâdy Zuweirah. The road leads up a winding ravine in the bare limestone hills that extend all along the west side of the Dead Sea.

A picturesque Saracenic castle, now in ruins, is perched on an isolated hill in the centre of the valley, defending the pass from an enemy advancing from the east.

An ingenious loophole has been cut in the rocks on the opposite side of the valley in advance of the castle, from which the valley is entirely commanded.

After the castle the road ascends steeply by zigzags to a pass, after which the country is more level, but continues to ascend as far as Râs Zuweirah.

Camp was pitched after dark in Wâdy el 'Abd, where there is a small supply of water. The water supply in these wells is very limited.

Next morning I was able to obtain a valuable round of observations from the cairn on Râs Zuweirah, at the top of the ascent. The cairn itself was apparently a very ancient landmark or tumulus, and is seen prominently from all the country round.

Passing over some rolling hills through very open country, with a few ruins distinctly marked by the verdure around them, we encamped on the edge of our former surveyed work at Tell el Milh. The following day we marched to Bir es Seba, and from there to Tell abu Hareirah, all in the published Map of Palestine.

At the latter place I left the party, and with four Arabs of the Egyptian tribe struck across country by a southern road to Ismailia. The rest of the party proceeded to Gaza.

I was greatly assisted in my work by Mr. George Armstrong, late Serjeant-Major R.E. who has had a vast amount of experience in surveying in the East for the Palestine Exploration Fund, and without his aid I should not have been able to arrive at nearly as satisfactory results on this expedition.

The means of surveying adopted was, 1st : In the Mount Sinai work taking a broad base over twenty miles long on Sir Charles Wilson's surveyed country ; positions were fixed by observation, and a chain of observations were kept through to 'Akabah.

2nd. At 'Akabah a base line was measured, and the former work connected with it. A triangulation was then extended up the Wâdy 'Arabah until, at Râs Zuweirah and Kusr Sh. Ali, it joins on to the old triangulation of Palestine proper.

The attached diagram of triangulation will show the number of points observed.

The plans will show full details of the work done. Heights were obtained up the Wâdy 'Arabah by vertical angles.

The total area triangulated and surveyed in the above manner in the two months employed is roughly 3,000 square miles.

Owing to the rapid passage of the party through the country, and the impossibility of getting guides with local knowledge, the names are not, in my opinion, in every case reliable, although I took every opportunity to check them by local information as much as possible. Many more names could also be collected by a more lengthy stay in the country.

I had the names written down in Arabic, so that the spelling is as correct as possible ; but I have reason to believe the localities were not always correctly shown.

#### TELL ABU HAREIRAH TO ISMAILIA.

On the 31st December I left Tell abu Hareirah with four Arabs of the Huweitât tribe of Egypt that had been sent to us at the Dead Sea with a letter from Sir E. Baring describing the disasters in the Soudan.

The rest of the party went on to Gaza to undergo quarantine.

As the El Arish road was well known, I determined to march direct on Ismailia, thus striking out a new line, and passing through much more interesting country. One of my party, Abu Suweilim, had been employed by Sir C. Warren in hunting the murderers of Professor Palmer, and was one of the most energetic useful Arabs I have ever met : he had

been the road we were about to take fifteen years before ; the others did not know the road at all, and were of the usual Bedouin type, lazy and greedy.

Passing over a plain of cultivated ground, with numerous Arab tents, the inhabitants of which were busily employed in ploughing, and which had been already surveyed about one o'clock, I came to Wâdy Fara ; this is a large and deeply cut wâdy, and contained a good deal of water. Just below the crossing there is a prominent mound called Tell el Fara, and before descending there are some traces of ruins and foundations of buildings called Kh. el Fara, but nothing of importance was left. An hour beyond the valley is a well-known tent called El Khudra, where for the last ten years a merchant from Gaza has traded with the Arab tribes, and doubtless does a good business, as many of the Arabs dare not show themselves in Gaza. The trader was a Bulgarian, and was so delighted at hearing his native tongue spoken that he would take no pay for the provisions of coffee, dates, and a saddle-bag I bought ; he said he often had dangerous times with the Arabs, but that he bought a protection from the most powerful of the neighbourhood, and always obtained restitution of anything stolen.

We pushed on over open country until dark, when we made our camp fire on an open plain with a number of Bedouin's fires blazing round us. I was passed as Abdullah Bey, an Egyptian official journeying back to Egypt after having been to Jerusalem, and although it was only begun for that little while, I thus revived the name borne by a much more distinguished traveller, the great Sheikh Abdullah, and although it was only stated to stop the curiosity of the Arabs we met, I soon found I was called nothing else.

At dawn we were up, and after feeding the camels and getting some coffee brewed we were ready to start at 8.30. During the whole journey I never could manage to get started much before this hour, as the Bedouins require some time to get the night chills out of their bones ; the nights were certainly very cold and damp. Our track after crossing a plain struck a road coming from the north-west, and after rising a slight hill the country gradually became more and more sandy, all signs of cultivation gradually dying out, and the continual climbing up and down the sand dunes being most fatiguing and monotonous. At 12 o'clock the track changed direction to south-west, down an open valley amongst sand dunes called San'a el Men'at, and we camped in a little valley surrounded by the sand. Next morning the route was continued over sand dunes, and we came early to a considerable pool of rain-water called El Khubara ; it is formed by the soil of Wâdy Abyad being turned by the Arabs into an old valley bed which is now closed, and they informed me it was kept full all the winter by rain-water coming down the wâdy. A few minutes further on is the first big valley since Wâdy Fara ; it is called Wâdy el Abyad, Wâdy Khubara, and Wâdy ez Zayik, and runs with a broad bed through the sandhills to the north-west ; there are many tamarisks and bushes along its course. Here we stopped for an hour to bake bread, and

then leaving the valley crossed over more sandhills which seemed interminable. At last the country opened out, and after passing over some very broken ground we arrived at Wády el 'Arish.

The valley runs in a deeply-cut bed with mud banks ; it is here about 80 yards wide. There was a pool of rain-water in a bend of the valley, which my guides informed me covered a well called Bír el Mujdebbah, and if my guides' account was true, that water could be got here all the year round ; this is the only perennial source on this road as far as Ismailia.

After Wády el 'Arish the country opens out into a broad plain with an isolated small range of hills called Jebel el Bena in the centre. To the north there is a sandy covered range called Riza Anizeh, and to the south the high hills of Jebel Helah ; a track leading away to the south-west between Jebel Bena and Jebel Helah through an open plain, led, I was told, to Suez. Here camp was pitched.

Next day we passed close under Jebel Bena on the north side over a stony plain called Ragadda ; the hills were formed of nummulitic limestone, and appeared perfectly dry and bare ; the wide open plains were very flat and bare of vegetation, with the exception of a small amount of the usual desert shrub. It was a great relief to get clear of the sand dunes, which ended close to Wády el 'Arish.

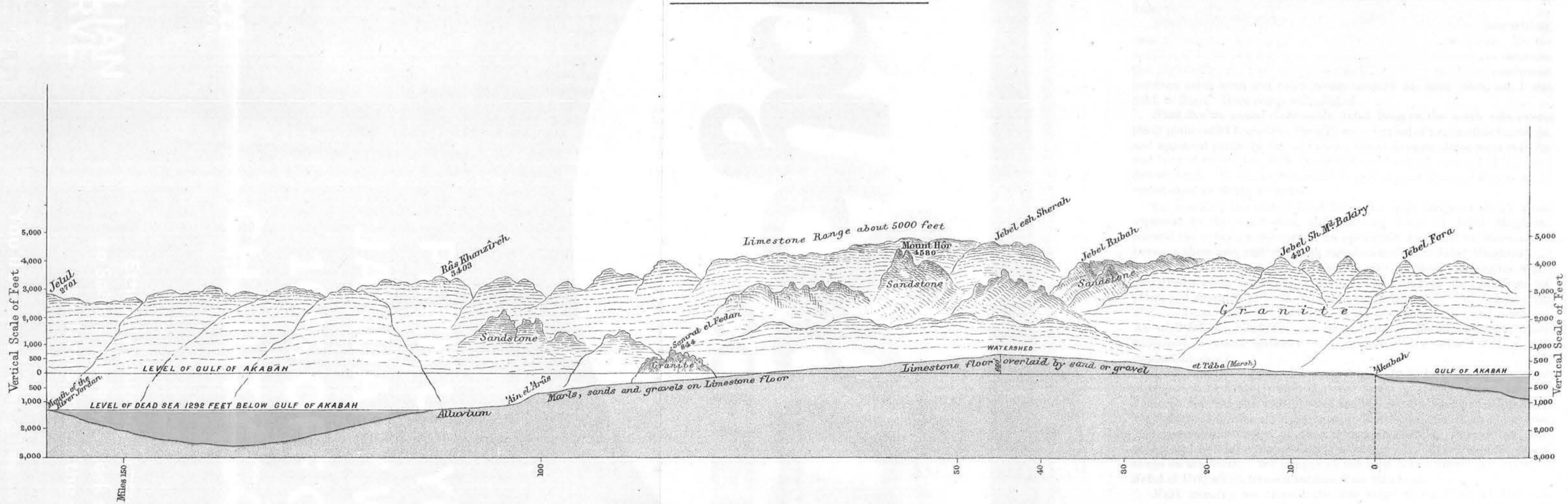
On reaching the end of Jebel Bena the high range of Jebel Yelek appeared to the south-west, and the long range of Jebel Mugharah flanked the valley on the north ; an open plain up which we travelled led between these two, and our track ran close under the Jebel Mugharah. I was told there was a cave in the interior of these mountains which contained a perennial supply of water. The hills rose abruptly from the plain, and appeared to be of the same formation as the nummulitic range of Jebel Bena. In some places the strata were much bent and contorted. At nightfall we reached a ruined well called Bir el Hemmeh, which contained a small quantity of stagnant water which had a very unpleasant smell.

Next morning we passed a small ridge formed by a volcanic outbreak of trap rock, and shortly after the sand began to appear again. In a few hours we reached the watershed of the valley ; the sand had increased to high ridges and hills, through or over which we had to find our way. The watershed was flat, another open valley leading away to the west with Jebel Felleh on the south, and a continuation of the Jebel Mugharah range on the north. We camped on the sand near a prominent top called Jebel el Urf, which forms a landmark on this road.

Next morning we crossed the low ridge under Jebel el Urf, and passing down a sandy valley at noon we came to a flat of mud which formed the end of the valley, a barrier of sand having been thrown up and thus stopping up the valley completely. Crossing this ridge an immense extent of sandhills appeared as far as the eye could reach. I do not think I have ever seen so desolate and dreary a country : nothing but ridge after ridge of sand dunes for an immense distance. The wind blew

# SECTION OF WADY ARABAH,

SHEWING THE DEPRESSION OF THE DEAD SEA BELOW THE GULF OF AKABAH, AND OUTLINE OF MOUNTAINS LOOKING EAST.



Drawn by  
Geo. Armstrong.

F. Waller

a strong gale from the west, sending the sand up into our faces so sharply that the camels would at times hardly face it. This wind lasted, unfortunately, until we reached Ismailia, and was very trying to the whole party.

We camped under a sandhill and had a very cold and windy night. Next morning it was found we had no water. The Arabs are always most improvident about water, and require continual watching; during the night they had used up the last drop, and in the morning said they could not go on without a fresh supply, as there was no chance of water before Ismailia, and they did not know how long it would take to get in.

They said they could find rain-water in Jebel Felleh. I, however, insisted on going on, and with some difficulty got the camels under way. Two of my Arabs had been lagging behind for some time, so one of the Arabs and myself went back and drove up the camels; the two Arabs were sulky and deserted; however, we got the camels all right. Pushing on through a blinding storm of sand over hill and valley, with only the compass to guide us, at 4 P.M. I saw Lake Tumah, and skirting the shore reached the ferry over the canal at dusk. I had some little difficulty in getting the party across the canal, and was not sorry when I reached comfortable quarters in Ismailia.

H. H. KITCHENER.

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## THE SECTION OF THE WÂDY 'ARABAH.

THE Wâdy 'Arabah extends from the head of the Gulf of 'Akabah to the south end of the Dead Sea, and is 112 miles long.

The width of the valley at the foot of the hills, from 'Akabah to near the lowest point of the watershed, averages about six miles.

A series of low ridges, called Er Risheh, of about 150 feet above the plain, run obliquely across the valley at this point, forming a length of ten miles. Opposite Mount Hor the valley widens out to thirteen miles, and gradually narrows in to six miles at the south end of the Dead Sea—the same width as that at 'Akabah. The sectional line is drawn from the Gulf at 'Akabah, through Wâdy 'Arabah, representing the lowest depression, to the southern end of the Dead Sea, and continued to the northern end, where the river Jordan enters, showing the depression of the Dead Sea, and that part of Wâdy 'Arabah below the sea level of the Gulf of 'Akabah.

The lowest point of the watershed (660 feet above Gulf of 'Akabah) is computed to be forty-five miles from 'Akabah, and twenty-nine miles farther north the sea level point is reached.

The sketch of the outline of the hills on the eastern side of the valley is given relative to the calculated heights as noted.

Those on the western side (not shown on section) range about 1,900 feet above sea level.

GEO. ARMSTRONG.