

The natives pretended that the inscriptions were found at 'Askalân, but certainly neither Mr. Bauernfeind nor myself could carry the responsibility as to the truth of their statements.

G. SCHUMACHER.

HAIFA, 30th August, 1886.

HIPPOS OF THE DECAPOLIS.

MORE than eleven years ago¹ I had the honour of reading before the Académie des Inscriptions et Belles Lettres, a memoir entitled, "*Where was Hippos of the Decapolis?*" In this memoir I endeavoured to establish, chiefly with the help of Arabic documents, too often neglected by Biblical scholars, that the site of this ancient city, belonging to a district close to the Sea of Tiberias, mentioned several times in the Gospels, must not be identified with any of the various localities suggested until then by the most authorised topographers of the Holy Land.

Relying on the fact that the Semitic name of the city of Hippos was *Sousitha* (which has the same signification, *sous*,² and *hippos* meaning "*horse*"), I attempted to show—

That this name of *Sousitha* should correspond to an Arabic word, *Sousya*;

That this name *Sousya* had been faithfully preserved by the ancient Arabic geographers.³

That it was still applied by them, during the mediæval ages,⁴ to a locality situated not far from the Sea of Tiberias, and corresponding exactly with the ancient sacred and profane data concerning the situation of Hippos.

I added, taking into account the remarkable persistence of the Arabic tradition in the matter of toponymy, that the name of *Sousya*, although not appearing upon any of the maps published until then, could not have disappeared; that a conscientious exploration of this country, which I had

¹ Sitting of the 4th June, 1875. The memoir was published the same year in the *Revue Archéologique*.

² The feminine form *Sousitha* would appear to indicate, either the Greek name of the city as being ἡ Ἴππος, *the mare*, and not ὁ Ἴππος, *the horse*; or that *Sousitha* corresponds, properly speaking, less to the name of the city itself than to that of the surrounding country, Ἰππηνή (*ἰππηνή*) being strictly the ethnical feminine of Ἴππος Ἴππος, ἰππηνός, ἰππηνή = *Sous, Sousi, Sousitha*).

³ Especially by Ibn Khordadbeh, whose valuable text we owe to the masterly erudition of M. Barbier de Meynard.

⁴ I take this opportunity of pointing out that the name of *Sousya* seems to me to have been known to the Crusaders, and preserved under the form of *Sesye*, "*Casal*," situated near the Jordan, and given by Tancred to the Hospital in 1101 (Paoli, *Codice Diplomatico*, I, No. 156; Rey, *Les Colonies Franques*, p. 446).

not been able to visit myself, could not but result in the discovery, at the place I suggested, of a "Khurbet" *Sousya*; finally that this was the spot where the site of Hippos should be fixed. It would be easy, I wrote, for the first traveller surveying the neighbourhood of the Sea of Tiberias to make the necessary verification on the spot.

I have the satisfaction to state that this verification has just been made, and that it fully confirms my anticipations. A German traveller, Herr Schumacher, who has quite recently surveyed the Jaulân—the territory of the ancient province of Gaulônitis—has found, between Fik and Kal'at el-Hosn, the *Sousya* or *Sousiya* whose existence I announced in 1875.¹ He does not hesitate to recognise in the extensive ruins bearing this characteristic name, the city of Hippos, whose autonomous coins he had collected in the adjacent localities.

Herr Schumacher makes no mention of my memoir, where long ago was formally exposed the theoretical solution of the problem which has just received its application on the spot. This omission can, to a certain extent, be understood; this traveller appearing only to have known, in the way of modern works on this country, Mr. Selah Merrill's book, "The East of Jordan," and this book, although several years later than my memoir, does not, as far as I am aware of, appear to have taken account of its conclusions.

It is more surprising that these conclusions are not remembered by MM. Guthe and Socin, who are generally so conversant with everything concerning Palestine, and who have published, enriching it with numerous and learned notes, the interesting account of Herr Schumacher.²

I, for my part, understand it so much the less, because M. Socin was certainly acquainted with my memoir, after the reading of which he was kind enough to send me, more than seven years since,³ some accessory remarks.

If I have judged it necessary to bring these facts before the public, it is less, I hasten to say, to raise a question of priority, than to make known the final proof of a theory which had been accepted on trust by several persons. Above the secondary interest a savant may have in claiming any discovery there is the superior interest of science, which ought not to neglect registering the evidence of the exactitude of its method. It is for

¹ Zeitschrift des Deutschen Palästina, Vereins, IX, pp. 187, 324, 334, 349. Leipzig, 1886.

² These notes are sometimes open to criticism; for instance, p. 170, the pronunciation *rujâl* (men) is really used in the modern Arabic, whatever M. Socin may assert; p. 172, the same remark applies to *tôm* and *tômè* (garlic); p. 173, a *râg* does not only mean *caves*, but also *cliffs*; p. 185, the dissyllabic pronunciation *rûjûm* (heap) is also in use; p. 192, the true pronunciation is *Serrts* and not *Serts*, and the word is applied to a shrub whose botanical species I am unable to define, but, in any case, it is not a "Cicharienpflanze" (the name of the place *Serrts*, in the neighbourhood of Jerusalem, is of the same origin) ! &c.

³ Letter of the 2nd February, 1879.

this last reason that I permit myself to insist upon the importance and the bearing of the statement made by Herr Schumacher. This statement is not merely the material justification of my identification of Hippos with Sousya; it is, before all, the convincing proof of the method itself of inference, that I have many times had occasion to apply, or to advise the application of, to Biblical topography. I may perhaps be allowed to call to mind that it is owing to this method taking its main point from the Arabic tradition, written and oral, a very strict method in its apparent boldness, that I have, for instance, been enabled to determine, *à priori*, the site, hitherto vainly sought, of the royal Canaanite city of Gezer, and that with absolute certainty, thanks to the explicit inscriptions engraved on the rock I had the good fortune to discover several years after my theoretical determination.

Although Herr Schumacher does not bring us for Hippos this epigraphic guarantee, infinitely rare in Palestine, one may nevertheless, at the present time, as I proposed in 1875, confidently inscribe upon the maps, at the ruins of Sousya, the site of the ancient Hippos, and assimilate with the surrounding neighbourhood the district of *Hippene*, to which this important city had given its name.

CLERMONT-GANNEAU.

NOTES ON ARABIA PETRÆA AND THE COUNTRY LYING BETWEEN EGYPT AND PALESTINE.

BY COLONEL SIR CHARLES WARREN, G.C.B., R.E., K.C.M.G., F.R.S.

1. BETWEEN the cultivated lands of the Egyptian Delta and the hill country of Palestine extends an arid wilderness, part of which is known as Arabia Petræa; it is also known under the name of the Desert of the Exodus.

2. It is bounded on the north by the Mediterranean Sea, on the south-west by the Gulf of Suez, and on the south-east by the Gulf Akaba and Wady Arabah. It is thinly inhabited by nomadic tribes of Arabs, who, according to their traditions, have come from the south, from Mecca, and who are slowly migrating onward into Africa.

3. The country may roughly be divided for general description into four portions:

- a. The semi-fertile portions about the southern end of Palestine, which have once been cultivated but are now lying waste.
 - b. The arid table lands of the Tih.
 - c. The sandy dunes about the coast of the Mediterranean and Suez Canal.
 - d. The mountainous district of the Peninsula of Sinai.
- a. This is commonly called the "South Country," and of it Professor

Palmer remarks (p. 297, "The Desert of the Exodus"), "Half the Desert owes its existence to him (the Bedouin); and many a fertile plain, from which he has driven its useful and industrious inhabitants, becomes, in his hands, like the South Country, a parched and barren wilderness." This South Country, or Negeb, is wholly in Turkish territory; it is the home of the Lehwat, the Amarin, the Azazimeh, the Jehalin, and part of the Teyahah. It was once a well-cultivated land, and the ruins of the vineyards and terraces on the slope of the hills are still visible. This country is an artificial desert; it was not visited, and will not be further referred to.

b. The desert of the Tih is a limestone plateau, and is described in general terms in the "Desert of the Exodus."

c. The sandy dunes about the sea coast and Suez do not appear to be anywhere described. It is for the most part an undulating waste, covered with blown sand from the sea-shore or from the disintegration of sandstone rocks. Its sands are constantly but slowly in motion. In some portions the natural features of the country are very thickly covered with these sands, and only crop out at intervals.

d. The Peninsula of Sinai is described in a variety of works.

4. It is not proposed in the following remarks to make a compilation from other works, but simply to state what may be new or may have been previously incorrectly stated. The very best works contain most erroneous accounts of the Bedouin, and even Professor Palmer was mistaken about the localities they inhabit. It appears never to have been recognised that the tribal grounds are interlaced, and that in many parts detachments of several tribes are found amicably living near the same waters.

5. The desert territorially may be divided into three portions:

A. Turkish Territory.

B. Egyptian Territory east of the Suez Canal.

C. Egyptian Territory west of the Suez Canal.

6. The portion visited lies almost wholly between the Suez Canal and the Eastern Egyptian boundary. This boundary does not appear to have been clearly defined by treaty or otherwise. Several charts show it as a straight line drawn from Al Arish (on the Mediterranean) to Akaba; but, on the one hand, the Porte appears to assume a nominal control over some tribes of Bedouins to the west of this line (in Jebel Hilâl for example); while, on the other hand, the Egyptian territory on the coast of the Mediterranean extends up to Rephia, midway between Al Arish and Gaza. It seems probable that the boundary inland has never yet been demarked, and this uncertainty may at some future period be a source of difficulty leading to a conflict of jurisdiction.

7. The tribes are located according to the lettering:

Terebin, A.B.C.	Ayeideh, B.C.
Haiwatat, A.B.C.	Towarah, B.
Teyahah, A.B.	Sowârkeh, A.B.
Azazimeh, A.	M'said, B.C.
Alawin, A.	Turneilat, C.
Lehwat, A.B.	Mââseh, C.
Bili ben Ali, B.C.	

8. The *Terebin* comprise a very powerful series of tribes, principally living about Gaza, where they are said to number 2,000 fighting men.

Other detached minor tribes live near the Suez Canal, and a powerful tribe lives in the Gizeh district, near Cairo; these tribes are closely connected, but the Egyptian *Terebin* have, in many instances, almost become fellahin. Those who live in Syria are extremely turbulent and fanatical, and are always hostile to Franks. They are said to be very untrustworthy and deceitful. They have a large number of horses and camels, grow corn, and are very wealthy. The Turkish troops quarter themselves among them during harvest time for the purpose of collecting taxes, but are frequently driven out. The Turks generally keep some of their sheikhs in prison as hostages.

The *Haiwatats* comprise also a very powerful series of tribes. They inhabit a large tract of country east of the Gulf of Akaba, and also Wâdy Arabah, under the name of *Alawin*. They also occupy the country between Suez and Akaba, but only in detachments. They occupy the country between Suez and Cairo in great force, and also about Zagazig. During the late war they were ordered to furnish a contingent of 2,000 men to save Cairo from an attack from the direction of Suez.

Sheikh ibn Shedid belongs to a very wealthy family living close to Cairo, who from their wealth and influence, having obtained the ear of the Egyptian Government, assume a kind of control over all the other Egyptian Bedouins.

The *Azazimeh* live wholly in Turkish territory, to the west of Wâdy Arabah. They are a turbulent tribe, constantly at war with their neighbours. They have been seldom visited by travellers.

The *Alawin* are a branch of the *Haiwatat*, and live in Wâdy Arabah.

The *Lehewat* live near the *Azazimeh*; they do not appear to be a formidable tribe. Meter Sofieh, the guide to Professor Palmer's party, belonged to this tribe, but had ceased to live among them.

The *Bili ben Ali* live almost wholly west of the Suez Canal, but there are a few families about Al Arish.

The *Ayeideh* live almost wholly west of the Suez Canal, where they have been driven during the last few years by the *Terebin*, with whom they have still a blood feud; their lands formerly extended between Jebel Moghara and Ismailia.

The *Towarah* inhabit the desert of Sinai, and keep themselves aloof from other Bedouins; they are very poor, owing to the drying up of the Peninsula in recent years, caused by cutting down the timber; they are divided into several minor tribes not necessary to mention, as the whole of the fighting men would not number more than 600.

The *Sowârkeh* are said to be a powerful tribe; they live about Al Arish, and have horses. To all appearances they are a poor tribe. They carried on a successful war with the *Terebin* for many years, with whom they have a blood feud.

The *M'said* are a poor tribe inhabiting the Suez Canal on both sides, near Kantara; they are a branch of the *Lehewat*.

The *Tomeilat* live on the west of the Canal, about the Wâdy Tomeilat. Their Sheikh Ibrahim is a man of some weight among the Bedouins, though his tribe is not of much account.

The *Mâdseh* live in the mountains west of Suez; they are well-known marauders, and often travel several hundred miles in their looting expeditions. They are the finest of the Egyptian Bedouins, and would make magnificent soldiers if brought into tolerable discipline.

The *Teyahah* are a powerful tribe inhabiting the desert of the Tih and "South Country"; they are a very warlike tribe, and are, in many cases, well-disposed towards Franks; they have been in the habit of conducting tourists through their country from Neckel to Gaza.

9. The number of fighting men between the Suez Canal and Palestine has been very erroneously computed, having been often stated as 50,000 to 80,000; at the very highest estimate it is not likely to be more than 10,000, and of these a large number must always remain on the lands to guard the flocks.

THE PENINSULA OF SINAI.

10. The Peninsula of Sinai is described in the "Ordnance Survey of Sinai," and in Professor Palmer's "Desert of the Exodus."

The Plateau of the Tih, rising to an altitude of 4,000 feet above the sea, projects into the Peninsula, and terminates abruptly in a limestone wall 1,500 feet in height, overhanging the sandy plains of Er Ramleh. This sandy plain is probably formed by the disintegration of the sandstone underlying the limestone.

Wherever the strata of sedimentary rocks were observed near the granite walls of the Peninsula, they were seen to have this horizontal position, and gradually become more and more tilted up as they approached the granite. It appears, therefore, to be probable that the sandstone and limestone foundations, once overlying the granite, have been removed by denudation.

11. The granite and other volcanic rocks, which now constitute the greater portion of the Peninsula, have evidently been filled in to some extent with sedimentary deposits, which again have for the most part been subsequently cleared out. In some cases the deposit, which is of a marly nature, has not quite been removed, and still fills up the lower portions of the valleys. It is to be seen in the Wâdy Feirân, Hebran, Ghurundel, &c.; and in all these valleys springs of water are to be found, as the rainfall cannot penetrate the marly floor, and has to run along its surface to the sea.

In other instances, where this deposit has disappeared and loose sand has replaced it, there is no water to be found.

The rainfall in the Peninsula is at the present time considerably less than it is in the Desert of the Tih, and the drought is excessive. This drought is ascribed to the gradual decrease of the trees—a decrease which has been going on steadily for the last thirty years, since the Egyptian Government imposed a tax of charcoal upon the Bedouins.

Should the Government alter this tax for one which would induce the Bedouin to grow trees, such as a tax of so many muids of dates, it is probable that trees would again flourish in the Peninsula. The cutting down of trees for charcoal should be prohibited, except in districts where trees are over-abundant and require thinning.

12. I was shown many places in the valleys where there had formerly been mazaireh (cultivated ground), but which has now been abandoned for years on account of the drought. In these places there were still existing the corn magazines and watch-houses, and the portion of the ground that had been subject to the plough was distinctly visible.

13. There are extensive palm-groves in the Wâdy Feirân and at Tor. Every Bedouin family has its garden of palm-trees. The fruit serves for food for the human beings, while the date-stones are boiled down for the goats.

There are several places in the Peninsula where the water might be dammed or stored up, but there are not such facilities for this here as in the Tih.

14. The Peninsula is principally inhabited by Towarah, but there are also a few families of Terebin, Haiwatats, Debûr, and Genounheh. They are all very poor. The Towarah are industrious, and are so poor that they have to eke out their living by driving camels for hire, and go into Egypt to act as servants in gardens. They have much work in connection with the Convent of Sinai, and see so much of tourists in the Peninsula, that they have less active prejudices against Franks than other Bedouins, and consequently are looked upon with doubt and suspicion by their neighbours.

In time of war they are not in the least likely to side with Christians, unless they are sure they are likely to be their future masters. The remark of the Bedouin is a very natural one: it is, "If I do anything for you openly, what is to become of me when I lose your protection?" The Towarah are not a warlike race, but they would defend their own mountain passes against great odds, or they might fight in the open in a fit of enthusiasm.

About the year 1869-70 they were ordered to assist in guarding the new Suez Canal; but Musa Nuseir, their head Sheikh, refused to do so, on the grounds that the Towarah had nothing to do with the country about the Canal, as they lived beyond it. He was cast into prison on this account, and remained there several months, but eventually succeeded in proving his assertion, and was released.

The Towarah do not now contribute towards the safety of the Canal in any way. It appears that there are very ancient archives in the bureau at Cairo, from which Musa Nuseir proved his case.

15. Musa Nuseir is the hereditary chief of a tribe, and is also Sheikh of all the Sheikhs of the Towarahs, but he is not the Sheikh of all the Towarahs. There is none! He has very little active power among the Bedouins, but he is a singularly upright and honest man, and exercises a strong moral influence upon the people by his good example and straightforwardness.

It is often stated in books that Musa Nuseir is the chief Sheikh in the desert: this is a very grave error. He has no power whatever among the Terebin, Haiwatat, Teyahah, &c., though his opinion as a councillor in the assembly of Sheikhs would be very highly esteemed. Personal influence goes a great way among these people, but intrigue counteracts it.

In such a case as the recent war, when sentiment ruled the Bedouin, the common-sense arguments of Musa Nuseir would be voted as ridiculous and out of place.

He is said during the war to have exercised some considerable control over the Towarah, and to have prevented their breaking out and sacking Tor. It is probable that his arguments among his own particular tribe may have acted as a wholesome check, but there is little doubt that Tor would have been sacked by the Towarah had not preparations been made for the defence at the proper time. Many of the Towarah took more heed of the messages of Arabi, sent through the Haiwatats, than of the arguments of Musa Nuseir.

THE TIH.

16. The plateau of the Tih, or Desert of the Wanderings, rises to a height of 4,000 feet above the sea at its southern end, and slopes down gently towards the north until it is lost in the sandy dunes fringing the Mediterranean coast.

It is formed of nearly horizontal strata of limestone, but here and there is found a fault, when sandstone is visible. The Tih consists of one vast plain, intersected towards the south by deep fissures, and is broken in places with mountain ranges, the principal of which are Jebbs Raha, Bodieh, Moghara, Yeleg, and Hilal.

17. The soil and vegetation of the Tih is very variable. There are many places where, for eight or ten miles at a stretch, the ground is hard like rock, and covered with pieces of broken flint, without a scrap of vegetation of any kind. In other places the ground is for miles as smooth as a bowling alley, with a hard, compact white surface, with no place for vegetation. In other parts there are stretches of hard sand, with scanty shrubs here and there.

But traversing all these there are to be found, at intervals, broad, shallow watercourses called *seils*. These are in many cases 100 yards or more wide, and in them are to be found shrubs all the year round, and after heavy rains the grass springs up in them and there is good pasture for several weeks for camels, sheep, and goats.

These seils are very slightly depressed below the general surface of the ground, and, when the rain falls, they present the appearance of broad rivers, 100 yards across, and from one to four feet deep. These waters might be run into dams, as is done in South Africa, and kept for summer use.

18. The so-called *River of Egypt*, or Wâdy al Arish, is a large seil commencing at the southern end of the Tih, and running a course of about

150 miles before it enters the Mediterranean near Al Arish. This river is, as a rule, a dry and shallow watercourse ; but at times, for a few hours, it is quite full of water to a depth of three to four feet. The beds of the large seils are very uneven, and the water will lie in the pot-holes for some weeks after heavy rains. Generally in January and February there is plenty of rain over the Tih—so much so that water for drinking, both for man and for herds, can be found every few miles in the plain, and all over the hills. During November, December, and March, there are often dense mists, moist fogs, and heavy dews, which saturate the shrubs with moisture, and even deposit moisture among the rocks, so that flocks do not require to go to water. These mists depend upon the wind, and often alternate with intense droughts.

19. The rainfall may perhaps be roughly estimated as 12 inches per annum, and appears to be considerably in excess of many of the pasture lands of South Africa. In fact, a great portion even of the desert proper only differs in degree from the sheep farms of South Africa. It will always remain more or less a desert at certain times of the year, but it is a desert which might with advantage be inhabited by farmers with settled homes.

20. There are very few springs in the Tih, and during the summer the Bedouins are often in great straits for water. The principal permanent springs may be enumerated.

Along the western edge of the Tih platform, Marbrook, Moses Wells, Wâdy Sudur, Elifih, Ghurundel.

In the Sinai Peninsula the springs about Sinai : Wâdy Feirân, Hebran, and Tor.

The springs in the Wâdy Al Arish : springs at Moghara, and in the sand dunes about Mahada and Gatieh, where there is fresh water near the surface over a stretch of several square miles.

21. As it is known that there are not only goats, but also a great number of sheep in the desert, it is obvious that there must be food for them. Sheep do not thrive during the hot weather, and at that time are not found to be such good mutton as goat. These sheep are of a very hardy nature, and ewes great with young have been known to travel thirty miles a day for four days without injury. When on the line of march, they generally first suffer from abrasion of their heavy tails.

The price asked for a sheep in the desert is four times that asked in the Jordan Valley, and they often cannot be obtained under 25 to 30 shillings. This excessive price indicates that there is a difficulty in rearing them. During the time we were in the desert, from September to March, we were not able to obtain any milk from the goats or sheep, except during the last month. In Palestine the sheep give milk during the winter.

There are no cattle of any kind in the desert. The only domestic animals seen were—sheep, goats, dogs, donkeys, camels, and horses. The latter are only found in the pasture lands between Al Arish and Gaza, and towards the South Country. Horses can be taken all over the desert, provided camels are taken with them with a supply of water.

22. The Bedouins congregate together during the summer and autumn, near the springs of water and palm-groves. In the spring they have grass and water everywhere, and are free to go where they like. In the winter they are in great straits, for they have to go where they can find herbage, and yet have to drive their flocks to water, sometimes a distance of twenty or more miles. This they do about twice a week, sending the camels for water for their camp when they have quite run out of water.

When visiting camps, it was not unusual for Bedouins to show that they had not a drop of water even for making coffee until the arrival of their camels, and I have sometimes found it necessary to provide the water for making their coffee, which, however, they have always scrupulously offered to return as soon as they have been enabled to do so.

23. It is quite a mistake to suppose that the Bedouins of this desert do not grow corn. Each tribe has its cultivated land (as well as its palm-groves), and they grow as much corn as they require for their sustenance. There are extensive Mazeirah in Wâdy Er Raj, on the Tih itself, and in various out-of-the-way places which travellers do not see.

Near Wâdy Sudur, on the summit of Jebel Rahah, at a height of 2,290 feet, is a large tract of Mazeirah, on which the Dubur and Terebtin grow their corn. This spot is chosen, both because the soil is fertile and because the sea breezes, charged with moisture, deposit water, in the form of rain or mists, on the high grounds early in the morning. In other cases the Bedouins have joint lands with the fellahin living on the outskirts of the occupied lands of Egypt and Palestine. A family or portion of a family of Bedouins will go a hundred miles or more, quite beyond the tribe, to cultivate land for corn.

The connection of the tribes one with another is difficult for Europeans to comprehend; it seems so contrary to the whole rules of Bedouin life as usually laid down. All the desert tribes have their allies or relations among the Bedouins or fellahin in the cultivated portions of Palestine and Egypt. For example, the Aligat tribe of the Towarah are allied by marriage with the Nifat of the Nile. No doubt this was at first dictated by policy, in order to secure themselves friends respectively in the desert or cultivated country; but it cuts both ways, and anybody who takes the trouble to investigate and understand these relationships will find it comparatively easy to make arrangements with tribes in the desert, however far they may be. In fact, with a reliable Government in Egypt and Palestine, the desert ought to be a safer place for life or property than any large European town possibly can be.

THE SANDY DUNES ABOUT THE COAST OF THE MEDITERRANEAN AND SUEZ CANAL.

24. These dunes are gradually sweeping onwards, and have already engulfed the old pasture lands of Goshen. They are caused, for the most part, by the blown-sands off the sea-shore, which are constantly moved inland by the prevailing wind.

The process is as follows :—The sand, when blown inland from the sea-shore, moves slowly forward in a succession of small waves, about $1\frac{1}{2}$ inches from crest to crest. Each wave has a gentle slope of about 10° towards the direction of the wind, while on the lee side it has an abrupt slope of about 30° . Each grain of sand is blown up the gentle slope, and falls by its own weight down the steep slope; thus the waves themselves have a small progressive motion. These small waves, from one cause or another, accumulate into large waves, which in some instances rise to the height of 300 to 400 feet. These large waves, like the small ones, have a gentle slope towards the wind, and a steep slope away from the wind. The sand falling down the steep slope at certain times makes a peculiar musical note from the vibration of the particles. These large sand waves or dunes are continually in motion. The motion is rendered very conspicuous owing to the effect it has on the telegraph line between Kantara and Al Arish. Telegraph poles placed near, or in the hollows, soon get covered up if not constantly moved, and those towards the crests of the dunes are left suspended in the air. The palm-trees at Gatieh, in the same manner, are covered up for awhile, and subsequently exposed. The shifting dunes extend inland from the sea to a distance of from fifty to eighty miles, as far as Jebel Yeleg and Jebel Hilal, and are only arrested in their onward course by the mountain ranges. In some cases the outlines of these ranges, as in Jebel Raha, are quite covered up.

There cannot be any extensive growth of shrubs on sand so continually shifting, and there can be no springs of water, with certain exceptions, which I will mention. The district of these sand dunes is looked upon with a certain amount of awe by the Bedouins, who rarely traverse it during the hot months, as water is so scarce, and there is danger if they lose their way.

The exceptional springs are those such as at Mahada, about thirty miles from Ismailia, which have been preserved in a remarkable manner. They are the old springs which were in use many hundreds, probably thousands, of years ago—possibly the springs used by the children of Israel living in Goshen. As the sands encroached, the shepherds using these springs have carried the sand away from their immediate neighbourhood, and this going on for hundreds of years has resulted in craters in the sand 300 to 400 feet, at the bottom of which the springs are found.

The land of Goshen is thus engulfed by the sand dunes, but it is there still underneath the sand, and fertile as in days gone by.

About Gatieh, between Ismailia and Lake Serbonis, there is fresh water underneath the soil in many places at a depth of a few feet, and here there are forests of palms, said to number 70,000. These are the property of the various tribes and families inhabiting the desert.
