

NOTES TO ACCOMPANY A MAP OF THE LATE REV.
F. W. HOLLAND'S JOURNEY FROM NUKHL TO 'AIN
KADEIS, JEBEL MAGRAH, AND ISMAILIA.

THE following brief account of a portion of the Rev. F. W. Holland's last journey in the desert has been compiled from his field notes, which have been kindly placed at my disposal by Mrs. Holland. The journey was a remarkable one ; it was boldly conceived, and no less boldly carried to a successful issue. To those who did not know the man, his extraordinary powers of endurance, his firmness and earnestness of purpose, and his power of winning the confidence of the Bedawin, the feat which he performed must seem almost incredible. I have rarely met any one who possessed in so high a degree those sterling qualities which win not only the respect, but the esteem of savage races. Khawaja Hulhul, as he was familiarly called, was a welcome guest in every Arab tent, and it will be many years before he is forgotten by the wild children of the desert whose good qualities he had learned to appreciate during his solitary wanderings in the peninsula of Sinai.

Leaving Evesham on the 21st March, 1878, Mr. Holland reached Suez on the 29th. The 30th was occupied by an excursion to the Bitter Lakes, and on the 31st he started into the desert with only three Arabs and three camels. Mr. Holland dressed and travelled as a European ; there was no attempt at concealment ; he relied entirely on his knowledge of Bedawi life and character, and the trust which he reposed in his companions was fully justified by the result. How far he had succeeded in winning the love of his guides is shown by a little incident that occurred shortly before reaching Nukhl. The camels had been sent forward to get water from the fort, and Mr. Holland was alone with Sheikh Nassar in the desert ; the thermometer stood at 102 degrees in the shade, and the Sheikh's eyes were growing dim with the feverishness that comes of intense thirst, yet nothing could induce him to touch the scanty store of water which he was carrying for Mr. Holland ; nor was Sheikh Nassar alone in this respect, for whenever any difficulties arose about food or water, the three Bedawin always insisted on reserving what there was for their European companion.

Mr. Holland returned to Ismailia on the 23rd May, after an absence of fifty-three days, during which he travelled over 1,000 miles on foot—an average of twenty miles a day, excluding halts ; and visited a district which had never previously been explored, and which, from the character of its inhabitants, had been deemed almost inaccessible. The journey had been planned long beforehand. Mr. Holland, in conversation with myself, had often expressed his belief that the Israelites must have left Sinai by a route followed in 1840 by Baron Koller, of which there is a short notice in the "Journal of the Royal Geographical Society" for 1842 ; and that

33° 30'

34°

34° 30'

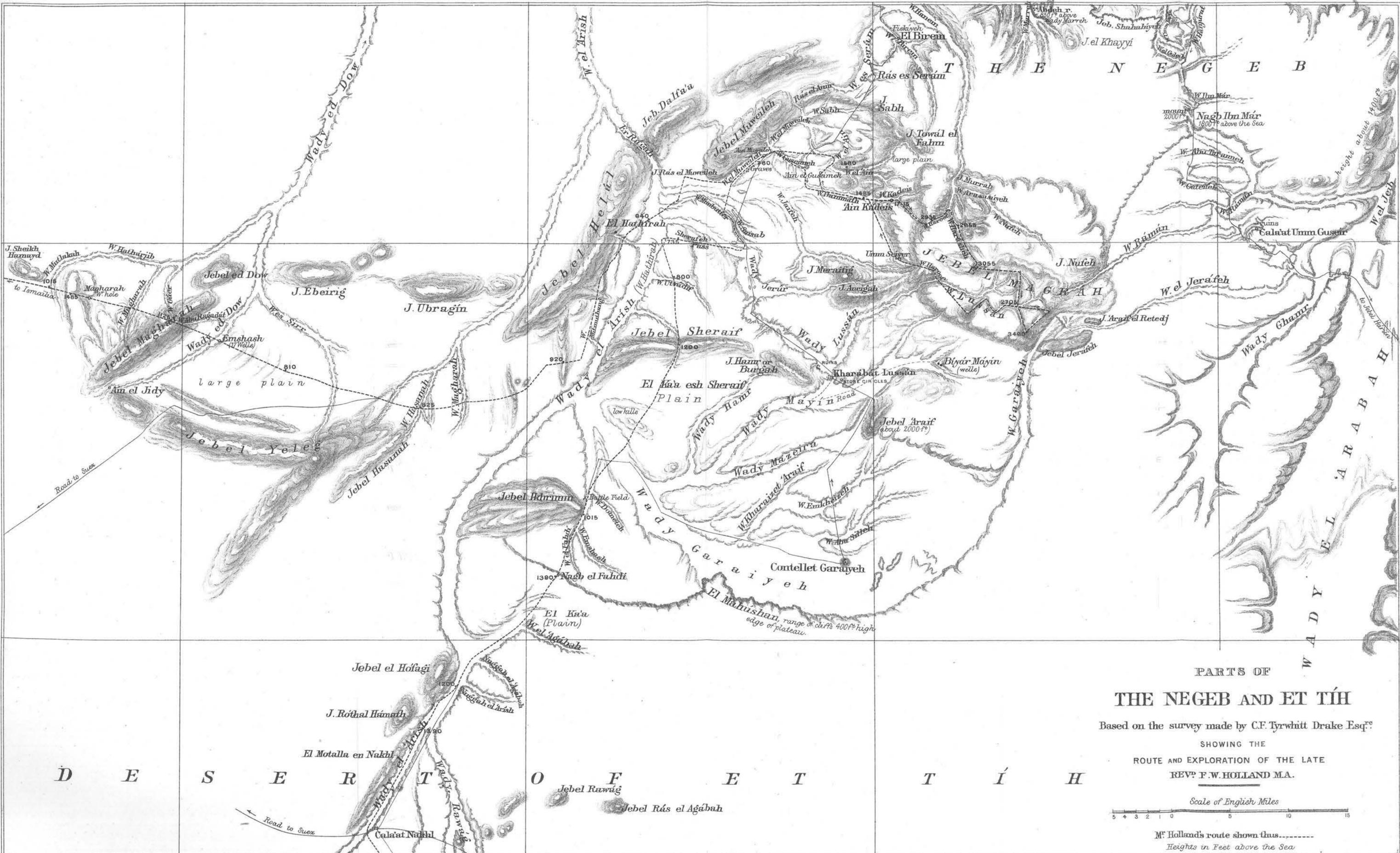
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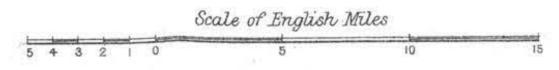
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PARTS OF
THE NEGEB AND ET TÍH

Based on the survey made by C.F. Tyrwhitt Drake Esq^r.

SHOWING THE
 ROUTE AND EXPLORATION OF THE LATE
 REV^d F.W. HOLLAND M.A.



M^r Holland's route shown thus.....
 Heights in Feet above the Sea

D E S E R T O F E T T Í H

Longitude 33° 30' E. of Greenwich

34°

34° 30'

35°

Kadesh was probably near the south-east corner of Jebel Magrah, whence, he assumed, there would be a good road, "the way of the spies," northwards. It was not, however, until 1878 that he was able to carry out his plans. His journey has established, beyond a doubt, that Baron Koller's route offers an extremely easy road to the Tih plateau, such as might have been followed by the Israelites with their women and children, their flocks, and their waggons. Unfortunately, the presence of raiding parties of hostile Bedawin prevented a complete examination of the southern edge of J. Magrah, but Mr. Holland ascertained that that mountain did not extend as far eastward as was generally supposed; and that an easy road, such as he had expected to find, led northwards, between Jebels Magrah and Jeráfèh to the broad caravan road, followed from the north by Palmer and Drake. There are several indications in the Bible which would lead us to believe that Kadesh was at the south-east corner of J. Magrah, but, for the present, it will be safer to adopt Mr. Holland's opinion, that if Kadesh-Barnea be not at W. Kadeis, it may probably be placed near the south-east base of J. Magrah, in Râs W. Garaiyeh. Besides the two important points alluded to above, Mr. Holland determined the true course of W. el Arish, which passes through a remarkable gorge in J. Helal; and the drainage system of J. Magrah, which sends part of its waters northwards by W. Harâsheh to W. Hanein, and part westwards to W. Lussân. He also discovered the important alluvial plain east of J. Helal, and, on his return journey to Ismailia, followed an old road, previously unknown, which is, in all probability, the way of Shur, by which Abraham went down into Egypt.

The only account of Mr. Holland's journey is contained in a paper read before the Dublin meeting of the British Association in 1878, and printed in the *Quarterly Statement* for April, 1879. It was always his intention to prepare a fuller narrative, with a map, but, unfortunately, he was "called away" before the work was even commenced. The map which accompanies these notes has been prepared from the rough field books; and the valuable sketches of the great plain of W. Jaifeh, at the mouth of W. Kadeis, and of the pass between Jebels Magrah and Jeráfèh, have been faithfully reproduced from the original drawings by Mr. Johnson, of the Ordnance Survey. The first weeks of Mr. Holland's journey were devoted to explorations in the peninsula of Sinai and to an examination of the passes leading to the Tih plateau, including Baron Koller's route; but as this district is now being surveyed by Captain Kitchener, R.E., I have thought it better to confine the present extracts from the journal to the journey north of Nukhl.

EXTRACTS FROM FIELD BOOK.

May 6th, 1878.—Left camp in W. Tureifeh at 8.40 A.M., and at 9 A.M. crossed over some low chalky "jorfs,"¹ 100 yards wide, to W. el Arish; 9.30, course north-east, down W. el Arish; the actual bed of the wâdy is

¹ Jorfs are banks of alluvial deposit.

small, but it appears to spread its waters over at least half a mile; passed some low chalk hills, weathered into peaks like tents. 10.20. Passed about half a mile west of the Castle of Nukhl; W. el Arish is here a large, barren plain, with no trees. 12.15. Low hill to the west, Motalla el Nukhl; alluvial plain. 1 P.M. Halt at junction of W. Rawág with W. el Arish; several "nawâmis."¹ 3.30 P.M. Started, and in ten minutes enter a tract of many acres, ploughed by the Arabs, to be sown with corn after rain; the alluvial plain is now more than a mile across. 5.5 P.M. Camp for the night in the narrow bed of the wâdy, about 8 feet deep and rocky in places; it is greener than the alluvial plain, which is so scored by watercourses as to be very bad ground for travelling.

May 7th.—Start at 6.10 A.M., and in twenty minutes reach a tract of 40 to 50 acres ploughed for sowing; jorfs in W. el Arish 15 feet high. 8.30. Nuggah el Agâbah; the alluvial plain is called Nuggah el Arish; these two nuggahs are probably Palmer's Wâdies Abu Jize, a name which my Arabs do not know. 9.0. Wâdy Agâbah; halt to visit "nawâmis" on a hill; they are evidently old tombs, a circle of stones with a cairn in the centre; I counted about thirty, scattered over a large area. On the hill-top were hundreds of snail shells and a quantity of lichen. A desert bird, "Mecky," seen here which, sitting on the top of a bush, begins a song like the low notes of a nightingale, and then suddenly springing up into the air, about 30 feet, and spreading out its wings, descends vertically with a succession of quick sharp notes. Wâdy el Arish runs north of J. Yeleg, not south as in Palmer's map. 12.30 p.m. Continued journey; 1.40 reach north end of the alluvial plain we had entered after crossing W. Agâbah; after ascending a flinty slope for about half a mile, we entered upon another plain, not alluvial, which seems to extend westward right up to J. Yeleg; this mountain runs north-east, and has its highest peak in the centre; it runs gradually out north-east and south-west, and must be quite twenty-five miles long. 2.30. Reach Nukb el Fahdi; from this point there is a magnificent view of the country north-east, and at our feet was a large plain bounded on the north by J. Ikhrimm, which runs west and east, about three miles distant. 4.0. Crossed the bed of W. el Fahdi, in which there was much broom; the road here has as many as twenty parallel tracks. 4.35. A large wâdy, "Emshâsh," runs in on the right from some white mountains to the south-south-east. 5.13. Camp in W. el Fahdi. J. Ikhrimm is composed of granite, sandstone, and limestone; the upper bed with flint bands. There are two small "Sayal" trees in W. el Fahdi, below the mountain, and hence probably was derived the wood seen by Palmer in the buildings at Contellet Garaiyeh. The "Sayal" (acacia) appears to grow only in granite and sandstone districts, and it is curious to find then here in conjunction with an outbreak of these rocks. The strata at the north-east end of J. Ikhrimm have a dip of about 30 degrees to the east. The continuation of the El Fahdi cliffs, eastward to Palmer's cliffs

¹ The stone houses and circles so common in the Sinaitic peninsula, and the desert, are called nawâmis by the Bedawin.

400 feet high in W. Garaiyeh, could be clearly traced in the morning and evening lights.

May 8th.—Start at 6.15 A.M. ; and at 7.10 reach Palmer's "battlefield" ; W. Dométeh runs in from south-east, the wâdy north of J. Ikhrimm is called Hashan el Ikhrimm ; further north is a large rolling plain ; the Arabs say Jebels Helal and Yeleg are, like J. Ikhrimm, of granite ; their appearance confirms this. 7.45. Turned north-north-east across the plain ; W. el Fahdi runs off to the north. 9.0. Alluvial plain of W. Garaiyeh. 9.40. Reach the other side of the alluvial plain ; there is no regular watercourse ; W. el Hamr flows in higher up from the north-east ; the junction with W. el Fahdi is about a mile lower down. Palmer's J. Umm Hesairah is much exaggerated on his map ; it is a low hill. Passing through a line of very low hills, or rather mounds, which bound W. Garaiyeh on the north, we entered another large plain, El Kaa'esh Sheraif. 12.25 P.M. Halt. 1.45. Continue journey over a gravelly plain ; my Arabs did not know the name W. Má'yín. 3.30. Head of pass over J. Sheraif, a long low range, which sweeps round in a semi-circle, the chord being north-north-west and east-south-east. It is formed by the sudden uptilting of the strata, and stretches eastward almost to J. Hamr. We lose from here the lines of the watercourses ; the eye is carried over them, and a vast plain appears to stretch southwards to Nukb el Fahdi, J. Ikhrimm, and J. Helal. The north side of J. Sheraif presents a line of more or less precipitous cliffs. The pass is narrow, up the bed of a small wâdy, and takes about half-an-hour to cross ; we turned down a small wâdy when half-way through, and came out on the plain nearer J. Helal, to which we turned. 4.50. Reach a large bed of alluvium. 5.30. Camped near some Arabs in the bed of W. Utvâdif, in the middle of the plain.

May 9th.—Started at 6.15, across an alluvial plain, towards J. Helal for water ; on the plain were some fig-trees, young palms, and the "Hamârt," which has a leaf something like the tamarisk, and a fig-like fruit ; there were also Doura, and the stubble of old crops. 7.15. W. Hathîrah is the name given here to W. el Arish. 8.15. Halted while Zeid went for water to J. Helal ; he returned at 2.15 P.M. with excellent water. The watering-place is called "El Hathîrah" ; there are five bad wells and one good one, which is very deep. There were many Arabs and camels at the wells watering, and we had to pay for water¹ (comp. Numbers xx, 19). El Hathîrah appears as a recess or basin between J. Helal and a lower range in front of it. 2.45. Started again across the plain towards J. Meraif, and at 3.55 reach the edge of the alluvial plain, with its maze of ridges and furrows ; in wet weather it must be quite impassable. 4.40. Struck the "Siccet esh Sham" (road to Syria), and at 4.50 camped on the plain. A herd of gazelle and flock of sandgrouse, "Guttah," were seen during the day, and small whirlwinds were frequent.

May 10th.—At 6.15 A.M. started north-east across plain ; low flat-topped hills scattered here and there show a former higher level ; large

¹ Mr. Holland proposed to identify El Hathîrah with "Hezron which is Hazor" (Josh. xv, 25).

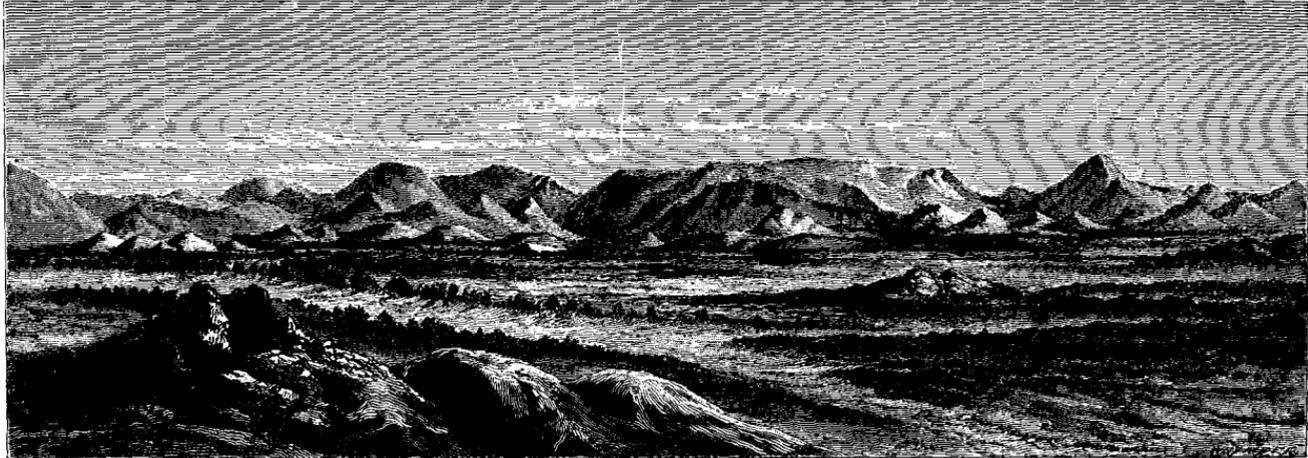
quantities of lichen on the small stones. 7.20. Sherâfeh, a pass over low hills ; there has been a gradual rise for the last half-hour ; we now descend to the plain of W. Jerûr. 7.50. W. Jerûr runs north-north-west ; the ground rises to the right of us and breaks into a low cliff on the east side, about a mile off. The name of the cleft through which W. el Arish runs is Er Râgah J. Helal. 9.15 halt in W. Saisab ; 12.55 start down W. Saisab. 1.30. W. Mimbutter, a broad shallow wâdy with alluvium ; cross some rising ground to a large plain, with much broom, extending apparently up to J. Magrah. 2.35. After crossing, for half-an-hour, a rolling plain, with several small wâdies running to W. Moweilah, we entered that wâdy near a small burial-ground ; here we met several Tiyâhah with fifty camels, which were feeding on the "Turfa," of which there is much in the wâdy. 4.0 P.M. Camp near a small cave, and close to a burial-ground with the tomb of a Sheikh, in whose honour we had sugar in our coffee, and repeated the first chapter of the Koran.

May 11th.—At 6 A.M., started east up W. Guseimeh. W. Moweilah turns east and forms an uneven basin about one mile in diameter ; the principal watering-place, in the centre, consists of a stream and three or four shallow wells with troughs. There is evidently much water here ; another large bed of rushes and damp sand marks the bed of a stream behind our tent. 7.30, unloaded camels in W. Guseimeh, and started up W. el 'Ain with Zeid. Great beds of rushes betoken the presence of water, and we had to pick our way through them on account of small streams. Above are numerous water-holes, and many camels were being watered. We stopped and had a talk with Tiyâhah Arabs, who said that J. Magrah was in the country of the Haiwât, of which tribe there was an encampment close at hand. We consequently returned to Nassar with two of the Arabs to talk over matters, and decided to load at once and go on to the Haiwât. There were great numbers of flint flakes all the way from W. Moweilah, and traces of old encampments. 9.15 started, and in thirty-five minutes reached the Haiwât tents in the middle of the plain at the head of W. Guseimeh ; I was most hospitably received by the Sheikh, and after dinner agreed with him for an escort to J. Magrah. On a hill between W. el 'Ain and W. Jaifeh, there are many round tombs and stone circles ; the wâdy is scattered with flint flakes and broken pottery. Below the mouth of W. el 'Ain there is a large level plain, forming the head of W. Guseimeh ; W. Sabh is a branch of W. Moweilah ; large numbers of sandgrouse seen.

May 12th.—Went with Selim up W. Guseimeh and W. el 'Ain ; the latter must overflow at times into the former, the head of which is a flat slope, used formerly for sowing corn, for which it is admirably suited, W. el 'Ain, after leaving the hills, sweeps round three groups of low hills in the plain of Guseimeh, and runs into W. Moweilah ; low mountains bound the plain on the north, running round in a semi-circle from J. Moweilah to J. Sabh ; there is a higher mountain behind the hills north of the Moweilah basin. The lower part of W. el 'Ain, before it enters the plain, is about a quarter of a mile wide ; the usual bed runs on the north side ; on the south is a thick bed of alluvial deposit, with many

J. Aneigah.

J. Merafig.



W. Kadeis.

W. Jaifeh.

A. Johnson, del.

WADY KADEIS AND WADY JAIFEH. (From a sketch by the late Rev. F. W. Holland, May 13th, 1878.)

rocks and boulders, which was in old days terraced for corn. In the centre, about half a mile up, is a rocky bit of ground covered with old tombs; Selim remarked that there must have been giants in those days, many of the stones used are so large. Higher up, W. el 'Ain branches, the main branch coming down from J Towál el Fahm. The bed of W. el 'Ain rises rather rapidly as one ascends, but there is a good path up to the point where it branches: above this it narrows, but there is still alluvium on the south side. A mile higher up there are large beds of rushes, a pretty sure sign of water. The mountains seem everywhere to have stone ruins, usually, but not always, round, upon them; and flakes of flint are found near them. There is abundance of pasturage, both on the mountains, which abound with paths, and also in the plains. Between J. Magrah and J. Towál el Fahm there is a large plateau on the same level as the hills north of W. el 'Ain, from six to ten miles across. A sandgrouse with nine young ones seen in W. el 'Ain; and nests found on the hills.

May 13th.—At 5.40 A.M. started south over a low pass.¹ 6.30. W. Jaifeh, several old tombs. 8.45. Stopped to kill a goat; a large "Góm" (raiding party) of Maazi Badawin, two hundred camels strong, reported near J. Ikhrimm yesterday; the Arabs are afraid, and I cannot get them to go further to-day; they say the "Góm" will go on during the night. The Haiwát Sheikh does not know the name of W. Gaiser (on Palmer's map); he calls the whole of this plain W. Jaifeh, though he gives the name of W. Dammath to the small wády we have followed. There is another W. Dammath, he says, near W. Sabh (this is given by Palmer). Walked to the mouth of W. Kadeis; the ground to the north-west of the mouth is broken by low hills; the wády is a good-sized one, and runs straight out into the plain; there are terraces for gardens and ruins near the mouth. There is a well in W. Jaifeh called Umm Séigát.

May 14th.—Started at 5 A.M., and at 5.15 A.M. reached the mouth of W. Kadeis, quarter of a mile broad; course east up W. Kadeis. 5.50. 'Ain Kadeis just above a turn in the wády, where it becomes narrower. There are three springs, two on the hill-side, and one in the bed of the wády; from the lower spring on the hill-side a good stream of water flows for about 100 yards down the wády, forming pools at which the goats are watered; the camels go to the spring. The upper spring on the hill-side is a poor one now; it is built round with large rough stones to a depth of 5 feet, and there is a rude stone trough here and at the lowest spring. The three springs are not more than 40 yards apart. The wády, which is stony throughout, has a bed, below the springs, nearly 15 feet deep, between stony jorfs. As one ascends, the mountains become lower and less steep; there is much pasturage on them; the lower strata are chalk, with flints; the upper, hard limestone (nummulitic?); large masses have fallen down and lie in the valley. There are a few fig-trees and a bed of coarse grass. About 50 yards higher up the wády than 'Ain Kadeis there is a deeper well with four old watering-places; there are also traces of others near. 6.50. Start south-east up wády; terraces and ruins on hill-side. 7.0. The

¹ See sketch from this point.

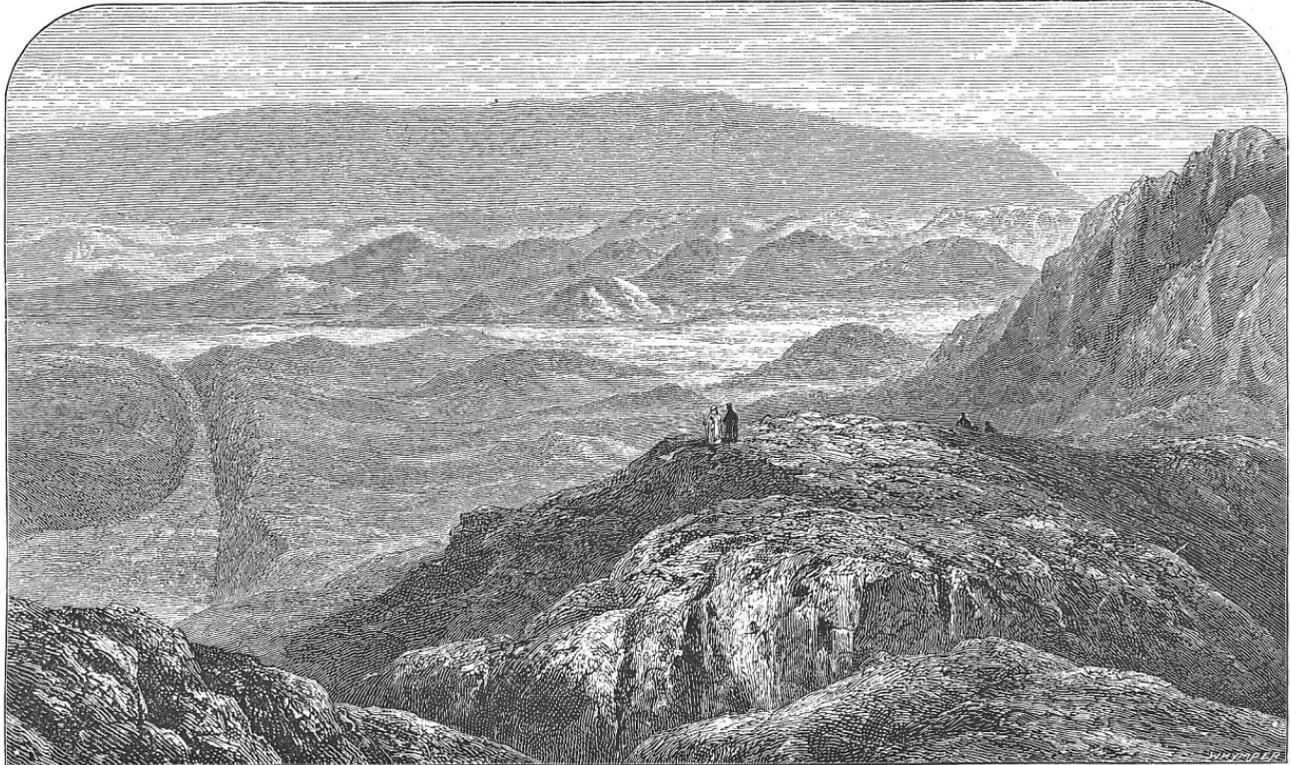
main branch of wâdy turns north-east and winds round to east; we keep south-east up a very narrow, steep, and rocky wâdy. 7.10. A Butmeh tree; the wâdy forks; we take left branch; a rapid ascent by a fair mountain path; meet goats and camels with women, all carrying spindles, and a girl with a nose ring. 7.30. Nummulites in crystalline limestone. 8.0. Four Arab tents; the path on the mountain side above the wâdy; steep sloping mountains, with flat rounded tops; the strata horizontal. 8.40. A Butmeh tree; the wâdy forks again; we ascend the shoulder between the two, and a sharp walk brought us to the top of the pass. 9.0. Head of W. Haroof, which runs east-north-east to W. Harâsheh. 9.30. Start down W. Haroof, and at 10.0 reach Arab tents and halt. Some of the Arabs had been fighting the Maazi "Gôm" yesterday; two Haiwât killed; and seven wounded; three Maazi killed. The Haiwât had gone down from W. Magrah to W. Garaiyeh, with twenty camels, to prepare ground for corn, when the "Gôm" came upon them and carried off their camels. There have been three Maazi "Gôms" lately; the first took nothing; the second was yesterday; the third is still in the country below Nukhl. J. Magrah consists of rounded hills covered with herbage; the rocks consist of very thin beds, less than 1 foot, of hard limestone, which, lying horizontally, give the mountain the appearance of having been built up in courses. 2.0. Start down W. Haroof. 2.12. Turn south-east up W. Harâsheh, which runs on eastwards; Butmeh trees and corn ground. 2.44. The wâdy forks, and the country becomes rather more open; the Arabs stopped here, as there were no tents further on. Ascended a mountain on the east with one of the Haiyât; the mountains round appear flat-topped from a height. W. Harâsheh seems to drain the whole of J. Magrah, and runs into W. Hanein, round the east end of J. Towâl el Fahm.

May 15th.—At 4.20 A.M. started south-south-east up W. Harâsheh; an open basin with Butmeh trees. 6.5. Halt at Arab tents; many flint flakes about, and "nawâmis" on hills near. 6.20. Continue on, east, along mountain top; patches of corn, and purple and yellow cistus. 6.55. J. Araif bears south-west six miles; W. Lussân runs up into J. Magrah from J. Araif. 7.5. Cross the head of a wâdy running south to W. Lussân; massive terraces and hundreds of flint flakes. 7.30. Another wâdy running south to W. Lussân. 7.40. Descend head of wâdy running south-east to W. Lussân. 8.40. Halt in W. Lussân. 10.45. Start, with two Arabs, south-east, up a branch of W. Lussân, and over the mountains. 11.30. Reach mountain over the head of W. Jerâfeh.¹ W. Jerâfeh runs between J. Araif el Retedj and J. Jerâfeh; it rises between J. Araif and J. Magrah, and flows south through a narrow pass between low hills; it then sweeps round to the east, draining a hilly basin under J. Jerâfeh, which appears from this point to be a triangular block. W. Garaiyeh rises between J. Jerâfeh and J. Magrah, and appears as a flat plain or basin half a mile broad. There is a good road this way across to the Arabah frequented by "Gôms." A long line of cliffs runs east-north-east, and west-south-west, and forms the boundary of J. Magrah at this

¹ See sketch of Pass between J. Jerâfeh and J. Magrah.

Jebel Jerâfeh.

Jebel Magrah. W. Garatyeh.



W. Jerâfeh.

A. Johnson, delt.

PASS BETWEEN JEBELS MAGRAH AND JERÂFEH. (From a sketch by the late Rev. F. W. Holland.)

point. W. es Sik heads with a branch of W. Jerâfeh running east-north-east under J. Magrah. The mountains north-east of J. Magrah are called J. Ramân ; W. Ramân rises about half a mile north of this point and runs east. A very large wâdy, or plain, W. Jehâmi, runs into W. Garaiyeh ; it is bounded on the south-west by a line of white cliffs ; is this Palmer's W. Ghamr ? It took forty-eight minutes to rejoin the camels in the branch of W. Lussân. Hearing some Arabs were near we turned and went up the hill-side by a very steep path for camels ; on reaching the top we saw a good-sized valley running west with an Arab camp, at which we halted, about a mile and a half down. Cistus, hollyhock, and sandgrouse in the wâdy.

May 16th.—Started at 4.30 A.M. down W. Lussân, course west. 5.40. Left camels and walked south-west up a side wâdy ; five minutes lower down a large wâdy runs into W. Lussân from the north-east. 6.20. Reach mountain east of W. Lussân. There is no valley between W. Lussân and W. Garaiyeh ; there is a higher range to the south-east, beyond which lies W. Garaiyeh ; the lower mountains appear to run down from this to J. Araif. W. Garaiyeh is bounded on the south by a line of cliffs and groups of white hills. W. Lussân drains a large district of J. Magrah ; it is very broad below this, but narrows at the bend near J. Araif. The west was enveloped with mist, which gradually lifted. 8.0. Rejoined the camels, which had kept down W. Lussân, at an Arab camp near the mouth of W. Haroof (No. 2). 11.45. Started up W. Haroof (No. 2). 12.25. Reached the head of the pass. 1.5. Halt at a watering-place, "Umm Seiyer," a hole under a limestone cliff, with a slope of dung down to it. 1.30. Start and reach the bottom of the pass in about a quarter an hour ; then travel north-north-west across a plain with extensive alluvial deposits. 5.15. Halt in the bed of W. Dammath. There is no road except one pass between J. Magrah and J. Meraifig.

May 17th.—Started 4.10 A.M., and at 4.35 reached the end of the plain. 5.20. W. Guseimeh ; east of W. Moweilah, the ground slopes up from W. Guseimeh to the edge of the cliff on the W. Jaifeh side. 5.30. Halt at Guseimeh watering-place ; the water-holes were now full of good water. 6.5. Continued on through chalk hills in the centre of the wâdy. 6.35. End of central group of hills. 6.55. The bed of W. el 'Ain sweeps round to the left round a second and smaller group of hills. 7.20. Crossed W. Arêeshy, which has a large alluvial deposit. 7.30. Halt at an Arab camp. 2.10. Start for Ismailia. 3.15. 'Ain Moweilah. 3.55. Start down W. Moweilah. 4.35. A burial-place at the bottom of W. Moweilah ; met an Arab who inquired after Palmer and Drake. 5.15. Halt. We had a heavy shower and a grand rainbow at sunset ; heavy storms seemed going on northwards all the afternoon. Some Towârah Arabs camped with us.

May 18th.—4.30. A.M. Started west over alluvial deposits. 5.45. Turned south-west across W. Moweilah. 6.45. W. el Arish runs through the gap in J. Helal about three miles north-north-west of us ; we appear now half-way between the south points of Jebels Helal and Moweilah.

There is no wādy north of W. el Arish, only a plain between J. Mowelah and W. el Arish. 7.10. W. Mimbutter (?), a bed of alluvium, which took twelve minutes to cross, runs down from W. Meraifig. 7.27. W. el Arish; a large alluvial plain, ridge and furrow, covered with "Ajeram." 8.10. Reached west side of W. el Arish, and most glad to do so; the main body of the wādy is on the west side, and is marked by a line of "turfa." 10.5. Started west up a hard gravel slope. J. Helal is of sandstone resting on granite, with long, low, outlying hills of chalk. 10.40. W. Hathfreh, full of broom "retem." 11.30. Reach other side of W. Hathfreh, and travel across a stony plain sloping to W. el Arish. 12.0. Rolling flinty chalk hills. 12.30. Descend to the head of a plain and wind round head of chalk hills. 12.40. Steep ascent for ten minutes to the top of a chalk hill. 12.50. Descend into plain. 1.25. A low pass over chalk hills, covered with sand, into a large plain. To the south is J. Thurgah beta Garaiyeh, a continuation of J. Sheiger, sandstone, running east and west. 2.45. W. el Mitmūthang on left, runs south-south-east to W. el Arish; beyond it is a large plain covered with herbage. We ascend a bank from the sandy plain to a stony plateau. 3.30. Halt near an Arab camp under J. Helal.

May 19th.—Start at 3.20 A.M. up a gentle slope. 3.50. Water-parting. 4.35. West point of J. Helal, which gradually runs out north-north-west, distant four miles. We have kept parallel to J. Helal since leaving W. el Arish. There are no chalk hills at this end, or where there are wādies, as at Hathfrah. 5.5. J. Mugrah Helbush, a low granite hill one mile north-west J. el Ubragn, a high granite range, distant about twelve or fifteen miles beyond the west point of J. Helal, chalk hill, parallel to the road, which runs over a level plain with occasional sand, and not much herbage, it drains north-west. 5.35. Cross a low water-parting. 6.0. Gentle descent to a large rolling chalky plain. 6.45. Large sand drifts. 7.0. Halt in W. Maghārah. 7.30. Continue journey, and at 8.15 cross a low water-parting; a line of chalk hills on the right, running north-north-west. 8.30. A low pass through a range of chalk hills running north and south. 8.45. Halted in W. el Hasanah (Azmon?) near a well. There are three wells sunk in the wādy bed, but the water is bad, and only fit for camels; they are only built round at the top, and have curious round troughs as if made out of old columns; the water from a "seil" in the wādy is good. W. el Hasanah is a large wādy running east-north-east; it forks just above the wells. From this point, roads go to Nukhl, Suez, and Ismailia. 11.55. Start across chalk hills. 12.50. Cross a small wādy running north-east from J. Yeleg, which is three miles distant. 1.5. Descend into fertile plain draining from J. Yeleg; the road to Suez keeps on through J. Yeleg. 2.30. A large green wādy running north across the plain; a break in the chalk hills under J. Yeleg. 3.25. Halt.

May 20th.—3.35 A.M. start; 3.50 sand drifts. 4.30. Cross the plain to the pass in J. Maghārah; there are many sand-drifts in the plain and ancient burial-grounds, tombs, and stone circles, two of which on a

low hill were 10 yards in diameter. Maghârah is approached by a long slope, and loses its height as it is neared. 7.10. "Emshash," a group of about seventeen wells; only one, which is built to the bottom with stone, has water now; the stones are cut with the draw-ropes; the water is not very good. Five minutes beyond the well is a group of seven old tombs on a ridge. Aid stopped behind to wash in the well; how many have done the same before! 8.15. Reach the foot of J. Maghârah, which lies nearly at right angles to our course; from Emshash there is an ascent up a stony slope; the road consists of ten or twelve very old camel tracks. J. Yeleg stretches west as far as I can see, though it is a remarkably clear morning. The plain and wâdy between J. Yeleg and J. Maghârah is called W. Dow; there is no water in it, but beyond is a watering-place, "El Jidy," a well like Emshash. 8.40. Halt. 9.50. Continue the ascent; and at 10.17 reach the head of the pass, which is called W. Abu Ragadât, and enter a gravelly basin, one and a half miles across. The basin is surrounded by sandstone mountains, capped with limestone, which form the head of W. Gûer, or Gwêr. 11.45. Extensive ruins of round houses and tombs; two Sayal trees; the wâdy runs north-east. We turn to the left up a branch called W. Maghârah. 12.40. Halt. 1.15. Continue up wâdy, and at 1.55 reach Maghârah, a dirty water-hole, with a slope of dung down to it; there are traces of old masonry. There is another water-hole, under a rock, about 100 yards below, with good water. There are twelve very large watering-troughs, built of rough stones, round the upper hole. On the hills near are ruins of rectangular buildings, 30 feet by 20 feet, built with roughly-hewn stones; there is no mortar, but wooden tie-beams are built in. The rock contained ammonites. 2.10. Left Maghârah. 2.50. Top of pass; shelving rock dipping to the north. Descend by a wild pass over polished rock; in many places the rock had fallen on the path, which was probably much better in former times. 3.30. W. Mutlakah running north. Fine Sayal trees; the rocky shelves oblige the road to turn north for the descent. 4.15. Many "nawamîs" and long lines of cairns, like those at Moweilah, along the mountain tops on the east; more than forty in one line. J. Sheikh Hamayd on the right. 4.45. Halt. Some Arabs of the Alaideh tribe coming up, and proving troublesome, we started on at 6.45, and at 8.40 stopped for the night.

May 21st.—At 2.45 A.M. continued our journey over a rolling plateau with drifting sand. 4.45. End of the sand, and commenced to descend. 5.15. Halt. An extensive view over a large plain covered with hills of drifted sand. 7.0. Start. El Mahâddab, a watering-place, on the right. 8.30. J. Ras el Ellôo, a low mountain three miles to south-west. 9.0. Halt half-an-hour for camels to feed. 11.45. "El Motalla," a prominent point with "nawamîs"; found an arrow-head in a flint factory. Commence descent; a long low range, in the distance, on the south. 12.35. Halt. 2.30. Continue journey, and at 4.45 halt for the night.

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distance ; the sand is blown up from the north. A number of snakes' egg-shells seen yesterday and to-day. 6.15. Halt. 7.45. Continue journey. 10.55. Reach a high ridge after a long ascent. J. Hathâyib and Ras el Elôo in sight. J. Umm Ukshayb, a long low range, running north-east by south-west, about twenty-five miles distant on the right. 2.30. Sighted Ismailia and a large vessel going up the canal. Endless ridges and sand-drifts, walking not so good as yesterday. 2.45. Halt for the night.

May 23rd.—Start at 3.20 A.M., and reach canal at 7.15.

The above is an almost verbal transcript from Mr. Holland's field book, omitting the bearings, &c., which have been utilised in the construction of the map. It will be more useful to students in this form and will enable the general reader to follow Mr. Holland's route on the map, and realise the extent and value of his work, as well as the difficulties which he had to encounter.

C. W. W.

METEOROLOGICAL OBSERVATIONS.

Date and Place.	Minimum Thermometer.	Barometer.	Altitude.	Remarks.
	Degrees.	Degrees.	Feet.	
May 6, W. Tureifeh	47	28.52	1560	N.W. Breeze, cloudy.
Junction of Wâdies Rowâg and el Arish	....	28.70	1390	
„ 7, Camp W. el Arish	40	28.90	1200	Dew, light breeze from N.W.
Nukb el Fahdi ....	....	28.70	1390	
„ 8, Camp W. el Fahdi	49	29.10	1015	No wind, cloud- less.
Pass J. Sheraif ....	....	28.90	1200	
„ 9, Camp W. Utvâdîf	53	29.33	800	
„ 10, Camp on plain	46	29.40	735	
Sherafâh Pass ....	....	29.30	825	
„ 11, Camp W. Moweilah	42	29.35	780	
„ 12, Camp W. Guseimeh	42	29.08	1080	
Hill N. of W. el 'Ain....	....	28.50	1580	
„ 13, Camp W. Guseimeh....	49	29.10	1015	
„ 14, Camp W. Jaifeh ....	....	28.60	1485	
Mouth of W. Kadeis Ain Kadeis ....	....	28.55	1530	
Head of W. Haroof ....	....	28.36	1715	
„ 15, Camp W. Harâfeh ....	....	27.12	2935	
Arab tents on hill ....	....	27.40	2655	
Hill above W. Jerâfeh „ 16, Camp W. Lussan ....	....	27.00	3055	
„ 17, Camp W. Dammath....	....	26.60	3460	
„ 18, Camp W. Moweilah....	....	27.35	2705	
W. el Arish ....	....	....	....
Level of chalk hills ....	....	29.45	685	
„ 19, Water-parting ....	....	29.50	640	
W. el Hasanah ....	....	29.20	920	
	....	29.40	735	
	....	29.30	825	