

as a portion of the bed of the Salt Sea, when it stood about 600 feet above its present level. This level exactly corresponds to that of the terraces, both along the south and east of the Ghor, formed of lacustrine materials. The upper surface of Jebel Usdum was examined by Messrs. Hart and Laurence, of our party, but previous explorers have considered the sides inaccessible.

12. The author concurs with previous writers in considering that the Cretaceous and Tertiary periods succeeded each other over this region (at least as far as the marine deposits are concerned) without any important physical disturbances; in consequence of which the limestone formations of these periods are in physical conformity and are generally incapable of separation. It seems probable, however, that while the Nummulitic limestones predominate in the Egyptian and Nubian areas, those of the Cretaceous period were more fully developed over the area of Arabia Petræa and Palestine.

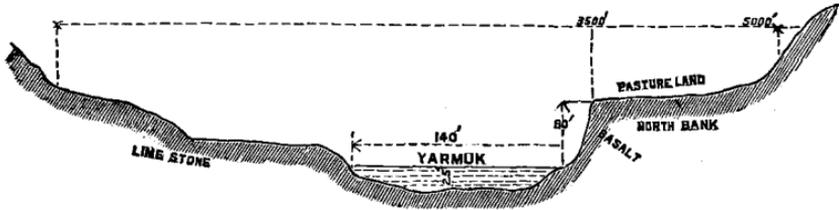
The scientific results of which the above is a summary are intended to be published *in extenso* by the Palestine Exploration Fund, together with a geological map of the whole district, and one on a larger scale of Wâdy el Arabah. The popular narrative of the Expedition will appear before the close of the year.

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## NOTES ON THE JAULÂN.

THE map which accompanies these notes is the result of a flying survey made by my travelling companion, Mr. Schumacher, in the course of a short exploratory ride which I took with him up the valley of the Yarmuk, beyond the Baths of Amatha, as well as of a survey of the adjoining part of Jaulân, which he made with a view of investigating its practicability for a line of railway. As I did not accompany him upon this latter expedition, I will merely give the results of my observations of the valley of the Yarmuk. The hot sulphur springs of Amatha, with the remains which surround them, and which are mentioned by Eusebius as being second only in the estimation of the Romans to the Baths of Baice, have been visited and described by two or three travellers, and although a more accurate investigation of these interesting ruins would doubtless prove richly remunerative from an antiquarian point of view, my opportunities were too limited to enable me to add to the stock of existing information. So, probably, would be an examination of the impenetrable jungle of M'Khaibeh, with its extensive grove of date-trees, and its hot sulphur spring, which is situated on the other side of the river, and about two miles higher up it; but it would require a stay of some days to make the necessary clearings, and cut paths through the vast thicket which is now the haunt of wild boar and other wild animals, which make their lairs amid the ruins that it no doubt conceals. Beyond this point, the

river, so far as I am aware, has never been explored, and it was with the view of tracing its course as far as practicable that we started one morning last April from our camp at Amatha. Some idea of the volume of water in the Yarmuk at this season of the year may be formed from



SECTION ACROSS NAKR YARMUK NEAR HAMA.

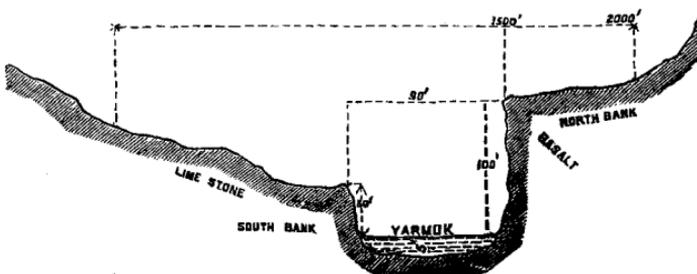
the fact that the river at this point was 140 feet broad, with a very swift current, that the water reached high up our saddle flaps, and that only four days previously the stream here had been unfordable. As, owing to the precipitous character of the banks, the river can only be followed by constantly crossing it, its present flooded condition augured badly for our success. Opposite M'Khaibeh the basalt cliffs rise abruptly from the foaming torrent to a height of about 300 feet, and I observed on their face the square openings into caves, which had evidently been the retreats of robbers at a former period, such as those who, as we know, in the time of Herod the Great, inhabited eyries of this description in the Wâdy Hamâm, near the Plain of Gennesereth. Huge eagles were sailing above them now. A little beyond M'Khaibeh the path diverged to the right, rising up the steep grassy spurs which descend from the forest-covered ridge, on the top of one of the summits of which are the ruins of Gadara, and so leading to the wooded plateau of Keferat. We declined to be seduced from our purpose by following this, and, although the natives assured us that there was no path up the valley, we decided to keep along a cattle track which soon led us to a precipice, across the face of which we had great difficulty in making our way. It had probably never before been used by anything but goats. We ultimately managed to scramble down it to the rocky margin of the stream, only to find it necessary to leave it again, and cross a high shoulder which formed another overhanging cliff. The view from this point was very grand—indeed I do not know any finer scenery in Palestine than that afforded by the gorges through which the Yarmuk cuts its way between the elevated plateaus of Jaulân and Ajlun to the Jordan Valley. Here the limestone and basalt formations meet, and in places one is superimposed upon the other, forming a black and white cliff of most singular aspect. Above the precipices on its right bank, which immediately overhang the river, are steep grassy slopes running up to the base of another series of cliffs, above which is the level plateau; on the left bank, which we were following, the cliffs are more broken and less lofty, the lateral valleys deeper and more irregular, and the grassy slopes in their descent soon meet the oak woods which show against

the sky line on the summit of the ridge. The upper edges of the plateau are from one to two miles apart in an air line, while the bed of the river is about 1,400 feet below them. After scrambling with great difficulty as near the bottom of the valley as we could, for about two hours, we reached a point where the side of the mountain having slipped away, exposed a sheer precipice of about 1,000 feet, and formed a mound in front of us, round which the river curled, as it swept under an opposite cliff. Here progress seemed barred on both sides, but seeing some Bedouin tents on the opposite bank, pitched on a level patch near the river of which they had taken advantage, we determined to attempt a ford with a view of interviewing them; for we had dispensed with a guide, my experience in exploratory travel having led me to the conclusion that guides generally take you in the direction which they want to go, and you don't. When the Arabs saw us approaching the river with the intention of fording it, they waved us back, and, in fact, the crossing, owing to the huge boulders, and the depth and swiftness of the current, was not without risk and a wetting; and they told us that we had crossed where there was no ford, and though the attempt had succeeded, it would be folly to make other attempts of a similar nature higher up. These people were not Bedouins, but sedentary Arabs from the village of Somma, who camp at this season in the valley to look after their grain and pasture their flocks; the name of their present camp was Zubennis. They received us with great hospitality, and, indeed, though the valley is reported unsafe, we found nothing to justify its reputation. We had not long left the Arab camp before we found that their account of the impossibility of a further ascent was correct. Perhaps at the driest season, by taking advantage of the river bed, the attempt would be practicable; as it was, we reached a point a little below the junction of the Wâdy Rukad with the Yarmuk.

As the Arabs had told me that on the summit of a high-crested hill opposite, called Kalat el Hösni, I should find ruins, I determined to recross the river at our former ford, and climb up to them. This, after a hard scramble, we succeeded in doing. Here I found a Khurbet, covering a few acres of ground; from its position on the summit of an almost pyramidal hill, it was evidently an ancient fortress. In places the drafted stones were still standing on the old foundations; there were some cisterns, and in the neighbourhood some rock-hewn tombs; the sides of the loculi, however, were completely broken away in the only ones the entrances to which admitted of examination. Unfortunately the name is too common to be of any assistance for purposes of identification. The elevation of Kalat el Hösni above the sea by my aneroid was 870 feet, and above the river about 1,000. I now made for a still higher summit, called by the natives Tel el Hetaliyeh: this has an elevation of 1,020 feet, and forms in fact the crest of the mountain, at the point where the slide already mentioned occurred. From the edge we looked sheer down a giddy height of at least a thousand feet. From this point we had a commanding view of the valley of the Yarmuk, and up the Wâdy Rukad, also of the Jaulân plateau, with the village of Dabusieh on its opposite edge. The interesting features of the Yarmuk

which have yet to be visited are its cataracts ; one of these will, I think, be found just above Tel el Ashera, the other possibly not far below it, but the upper one must be the most important. The fall of this river in the course of seven or eight miles must be at least 2,000 feet, and with its volume of water in the spring must afford a magnificent spectacle. My hope on the occasion was to have visited this waterfall, but I was unfortunately unable to complete my trip as I intended. The Allan, the Rukad, and other tributaries of the Yarmuk each have their own waterfall before joining the river. Mr. Schumacher, who has seen the fall of the Rukad, tells me that it falls at Jamly 300 feet in an unbroken sheet of water over a precipice.

We now struck, by a path we found through the woods, in a south-easterly direction. The oak trees grew sparsely, like those in a park, over the rich plateau, now carpeted with wild flowers. The precipitous ravines which intersected this upland, and which were sometimes covered with a dense undergrowth, frequently compelled us to depart from the direction which our compasses suggested as the proper one, and after riding for about three miles we were getting into despair at ever finding a practicable opening to the westward, when we fortunately came upon some peasants, who put us in the way. At this point I found two handsome sarcophagi, some tombs, hewn stones, and all the evidences of an ancient site, and on inquiring if it had a name was told *Haleebna*, which being interpreted means "Our milk." Thus our ride, if it had not been so productive of additions to the geography of the Yarmuk as I could have desired, furnished us with two hitherto unknown sites of ancient towns. Our way now led us down a lovely and romantic gorge, called the *Wady el Humra*. The elevation of the plateau at the point where we commenced the descent was 1,250 feet above the sea, and 1,800 above the Baths of Amatha. A little spring which we came upon near the head of the valley we were now descending soon swelled into a purling brook ; the steep and rocky hill-sides which rose abruptly from it were thickly clothed with a rich undergrowth, which on our right was broken off near the bottom into a precipitous white limestone cliff. Here we emerged upon



SECTION ACROSS THE YARMUK AT BIRKET EL ABAIS.

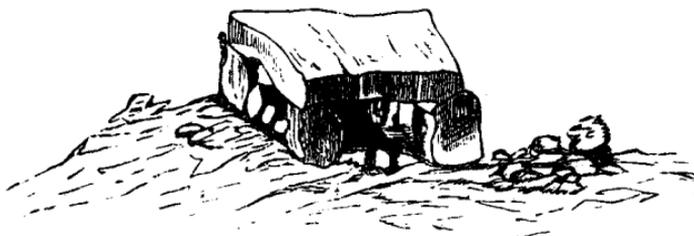
the grassy spurs which slope down to the Yarmuk, and came suddenly upon a pool of water, about a hundred yards long by fifty broad, called the

Birket el Arais, or Pool of the Bride. We had now reached the limits of former exploration, and in half-an-hour found ourselves once more skirting the jungle of M'Khaibeh, and within sight of our tents, after a ride of much topographical interest, and a beauty of scenery unsurpassed by anything in Palestine.

LAURENCE OLIPHANT.

The map which accompanies this report traces the course of the Yarmuk from the Jordan Valley to its junction with the Nakr Rukâd and part of the course of the latter, the Wâdy es Sammuk, and the Nakr 'Allân. It embraces also the ruins and villages of Hama, Debusi'yeh, Jamly, Kefr Elma, Fik, Hetin, Tsil, Adwân, &c. The heights are given, with a great amount of information on the character of the ground, &c. At Tsil were found a large collection of dolmens, one of which is sketched and is here figured.

DOLMEN NEAR TSIL.



*Dimensions.*

	ft.	in.
Length of table stone .. .. .	5	0
Breadth .. .. .	2	6
Height from ground .. .. .	2	0

## PRÆ-EXILIC JERUSALEM.

ABSENCE from England has prevented me from returning an earlier answer to the objections raised by Captain Conder and Canon Birch to my views in regard to the topography of præ-exilic Jerusalem. I will now try to atone for the delay, and do my best to meet the thrusts of my doughty antagonists.

I will take Captain Conder first, more especially as Canon Birch agrees with me about what is, after all, the main point, that is to say, the site of Zion. My statement that Dr. Guthe had discovered a valley separating Zion from Moriah, and had come across Solomonian walls to the south of the lower Pool of Siloam, was derived from his report upon the explora-