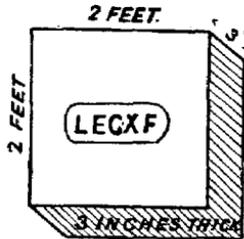


Some of the bricks, especially the larger ones, have *stamps*, of which also I give a pattern. We learn from them that these baths were made in midst of the ruins by the Roman soldiers of the 10th Legion. As such are found elsewhere also, as I have reported from time to time, it would seem that this legion was stationed for a long time in Jerusalem, and



ROMAN TILE FOUND ON EASTERN SLOPE OF MOUNT ZION.

perhaps that their tools for brickmaking may have been used afterwards by others, possibly even by the natives.

VII.

PROCEEDINGS IN SEARCHING FOR WATER.

As all places hitherto tried had failed, they made a shaft on the north side (inside the pool) of the southern wall of the Sultan's Pool in Wady Rahab, in the valley west of the Protestant (Bishop Gobat's) School, and *found some water*, but no conduit. The water simply came out from the moist deposit there, and when they had taken out this water it ended; there was neither spring nor drainage. Some digging in the street of Deir Addas, north of the Haram Area, had the same result: no spring was found, only a very little water, coming out from an unsound cistern.

NARRATIVE OF A TRIP TO PALMYRA IN APRIL, 1890.

By Rev. GEORGE E. POST, M.A., M.D., F.L.S., Beirût, Syria.

WE chose Damascus as our starting point, for several reasons—(1) its accessibility from Beirût, a matter of importance, as we had but a fortnight for the journey; (2) The ease with which we were able to get animals and supplies in that city; (3) The desire to observe the physical geography and botany of the spurs of Antilebanon, and the outlying

plains at the border of the arable land and the desert between Deir 'Atiyeh and Qaryetein.

At 9 a.m. of Thursday, April 3, the barometers¹ read *W.* 27.48, *B* 27.63; another aneroid, with which I compared both, read 27.43. This would give the height of Damascus above the sea as 2,325 feet. The sky was at the time overcast, following a previous day of showers.

At 1 p.m. we left the city by Bab Tûma, and rode for some time along the paved Aleppo causeway, until we struck the mountain road to Ma'arrâh.

Just out of the city we passed fields of Fenugreek (Arabice *Hilbah*). The seeds have a sweet, Coumarin smell, and are used to give an acceptable odour and taste to bread and biscuit. The plant is used as fodder, or to mix with other fodder to give it an appetizing smell and flavour. Cattle will often eat musty food when flavoured with Fenugreek. The milk of cows fed with it acquires a strong taste, which the natives do not dislike, but which is unpleasant to many foreigners.

The chain of Antilebanon begins at Hermon, which resembles a gigantic fin-back whale, rising over the plain of Cœle-syria. A *first chain*, composed of a table land, with few marked elevations above the general surface, extends from the shoulder of Hermon by Rasheiyah, E. by N., to the latitude of Baalbek, where it joins the main chain of Jebel-esh-Shurqi. The Wadi-el-Harîr and Wadi-el-Qarn form a pass through this chain, of which advantage was taken in constructing the Damascus Road. A *second chain* diverges somewhat more to the east, and under the name of *el-Jebel-esh-Shurqi*, trends about N.N.E. to the latitude of Hems Lake, where it gradually sinks to the plain at the "entering in of Hamath." The highest peaks of the Antilebanon are in this chain, overlooking the oval plain of Zebedani, which separates the two chains. The Barada, arising in this plain, flows southward, and then turning eastward, breaks through the second chain at Suq-Wadi-Barada, and continues an eastward course to Damascus. A *third chain* diverges from the Jebel-esh-Shurqi, north of el-Fiji, and trends in a N.E. direction to near the latitude of Hems, where it sinks into the plateau between Deir 'Atiyeh and Qaryetein. This is the ridge, on the eastern flank of which Sîdnâyah is situated, and is known by the name of *Jebel Qalamân*. A *fourth chain* continuous with the ridge of Jebel Qaisûn, takes a more easterly direction and then sweeps again to the north-east, and at last is merged south of Qaryetein in the range of el-Bârîdi and Jebel-'Ain-el-Wu'ûl, which stretches away to Palmyra. In the first part of its course from Damascus to Ma'arrâh, it is called *Jebel Khîtmeh*.

¹ The aneroids used on this trip were one of Watson's and one of Brown-ing's make. In the text *W* will signify the former and *B* the latter. Prof. Robert West, of the Syrian Protestant College has kindly calculated the heights indicated by the readings of the barometers, by comparison with those of the standard barometer of the Meteorological Department of the Observatory under his care.

These four chains have been compared to the four fingers of a left hand, spread apart, with the palm or surface directed upward. In this schematic representation, Hermon constitutes the palm; the westernmost chain corresponds to the forefinger; the main chain, or Jebel-esh-Shurqi, to the middle finger; the third, or Jebel Qalamûn, to the ring finger; and the fourth, or Jebel Khitmeḥ, to the little finger.

Our road from Damascus to Ma'arraḥ lay over the little finger of the mountain hand. On the chalky foot hills, glaring in the afternoon sunshine, we met with *Astragalus angulosus*, *Scorzonera lanata*, *Iberis odorata*, and *Androsace maxima*.

We breasted the first spur of this range in the face of a gale, which made it difficult for our animals to maintain their footing on the slippery rocks. But as we got under the lea of the ridge the wind ceased to blow in our faces, and we were able to enjoy the magnificent panorama of the Ghantāḥ, Ḥaurān, and Gilead, with the mountains of Galilee for a frame on the right, and Jebel-el-Bârîdî in the far distance on the left. The top of Jebel Khitmeḥ is saw-toothed and jagged in the extreme, and a steep talus of *débris* forbids the ascent along most of its eastern flank. We wound up gradually to a break in the crest, and just before reaching it passed through a natural cleft, where we collected fine specimens of *Lloydia rubroviridis*, *Bellevalia flexuosa*, and *Ornithogalum montanum*.

As soon as we had surmounted the crest, we began to pass over the rolling table land of Ma'arraḥ, which lies between the little and ring-fingers of the mountain system. Just before reaching the village we passed a series of shafts, many of them not more than eighteen inches across—some of them in the very path, where an incautious man or animal might easily fall in. They lead down to the village aqueduct, which is about fifteen feet below the surface of the ground. They are used to enable a man to go down into the aqueduct and clean it out. The villagers told me that every now and then an animal, or a part of him, falls into one of these pits, and once a child fell into one, and was rescued with some difficulty. Similar shafts are found in the neighbourhood of Qaryetein and Palmyra, and will be described in their place in this narrative. This system of water supply is widely known throughout Asia, and has been treated at length by Mr. Simpson in the *Quarterly Statement* for January, 1890.

Ma'arraḥ is five and a-half hours, mule time, from Damascus. At 7 p.m. the barometers were W. 25.7, B. 25.85; height by W., 4,200 feet above the sea. The sky was clear, and the air bracing and cool. We obtained two good rooms in the Syrian priest's house, and after a hearty supper, were not loath to compose ourselves to rest.

Friday, April 4, Ma'arraḥ.—Barometers, 7 a.m., W. 25.7, B. 25.85, as at evening.

The village and convent fortress of Sidnâyah are picturesquely situated on the eastern flank of the ring-finger range. A fine view of both is obtained about twenty minutes after leaving Ma'arraḥ. High above Sidnâyah, near the crest of the ridge, is the flat-topped and unpicturesque convent

of Mar Tûma. The road to Ma'lûlah lay along the base of the mountain range of Qalamûn, gradually rising all the way. Half-an-hour before arriving at Ma'lûlah, the direct road to Yebrûd, breaks through the range by a gorge, down which a rill of fresh cool water was running. In the clefts of the rocks by this rill we found *Aubrietia Libanotica*, a beautiful purple-flowered crucifer, hitherto not seen in Antilebanon. Mr. Bliss has described the Qalamûn range graphically in his article on Ma'lûlah in the *Quarterly Statement* for April, 1890. He has also given an exhaustive description of the village, its caves, inscriptions, and interesting dialect, leaving little for me to add. We found the rough ladder leading to the principal cave on the southern cliff still more ruinous than it was at the time of his visit.

At the village fountain we saw women washing. They sprinkled over the clothes a powder which we ascertained to be the *Ushnân*. It consists of the pulverised stalks and roots of *Salicornia fruticosa*, L., the Soda plant, which is also called *Hashishat-el-Qali*. This plant is reduced to an ash, from which soda is extracted by lixiviation, and used in the manufacture of hard soap. Our English word *alkali* consists of the Arabic definite article *al*, and the name of this plant *Qali*. The fathers of modern chemistry Latinised *Qali* to *Kalium*, and applied it to *Potassa* instead of to *Soda*. The people of Jarrûd, in whose neighbourhood the *Salicornia* grows abundantly, prepare the dried plant itself as a washing powder, by pounding it in a stone mortar.

We attempted to cross the range behind the town by the cañon. I succeeded in leading my horse through the cleft, which is at places only a yard wide, and reminds one, on a small scale, of the Gorges du Trient at Vernayaz. The horse of another of us fell in the water at the throat of the pass, and had to be pulled out backward. The third could not be induced even to attempt the passage. These two were led around the pass by a circuitous path up the rocks, near the convent of Mar Taqla, and we re-united our forces at the upper end of the gorge.

Barometer at top of pass, 2 p.m., W. 26.5, which gives height, 5,500 feet. Ma'lûlah is six hours, mule time, from Ma'arrâh.

Our road from Ma'lûlah to Yebrûd lay over the rolling table land at the top of the ring-finger of the mountain system. This land is bounded toward the west by the *Jebel-esh-Shurqi*, the middle finger of the series. Yebrûd is four hours farther on. We passed numerous wild almond trees on our way, and in a field by the roadside met with the pigmy, cream-coloured *Viola ebracteolata*, the smallest of the genus in Syria.

Just before entering Yebrûd through the pass which separates the plateau over which we had come from that of Nebk and Deir 'Atiyeh, we saw numerous rock-hewn tombs, none of them, however, of any special interest in this land of sepulchres. A copious stream of limpid, cold, mountain water arises at the gateway of the pass, and flows through the village and out among the extensive gardens to the north.

We spent the night at the hospitable home of ———. We arrived

just in time to escape a drizzling rain. There was, however, little wind. Barometer, 6.30 p.m., W. 25.35, B. 25.45.

Saturday, April 5.—6 a.m., Yebrûd. Barometer, W., 25.25, B., 25.4. Height above sea, W., 4,550 feet.

A little incident, illustrating Oriental customs, occurred in parting. M., being a stranger, felt that he had no claim for lodging and the items of commissariat which he had received, and on giving his hand to the host at parting pressed a medjeedie into his palm. The good man refused, warmly protesting in broken English that it would be a disgrace to a Syrian to receive money from a guest, and folded M.'s hand around the silver piece. M. said that it would be equally a disgrace for an American not to pay something. The host insisted, and the guest persisted in plying arguments, until the weight of proof and the subtle influence of the concealed coin gradually caused the host's hand to relax, when by a dexterous movement M. slid the coin out of his into the other's palm, and they bade good-bye to their mutual satisfaction.

On leaving Yebrûd, while still passing through the irrigated gardens, the village of en-Nebk loomed up imposingly an hour and a half to the northward. Being the last postal and telegraph station, we wished to send letters and a despatch to our friends, but we were told that, although it was already nearly 8 o'clock, the office would not be open for at least two hours.

Another hour and a half over the rolling prairie brought us to Deir-'Attyeh, where we rested for an hour in the hospitable house of Mr. Rahîl, the teacher of the Protestant school. We availed ourselves of the interval before the arrival of our train to write a letter to be sent by the teacher to Damascus. Barometer at 10 a.m., W. 25.7; B., 25.82; Height, W., 4,000 feet.

On leaving Deir-'Attyeh we entered the broad plain which merges on the left into the "entering in of Hamath," and on the other into the Syrian Desert. During the first hours of our way we met with large fields of *Chorispora Syriaca*, a pretty, pink-flowered crucifer, strongly resembling in general effect *Silene Atocion*, which is so abundant in the maritime plains, and the western water-shed of Lebanon and Palestine.

The range of Qalamûn, over which we had passed in coming from Ma'lûlâh to Yebrûd, now bore away to the right, while the main chain of the Jebel-esh-Shurqi trended to the left, and gradually descended toward the plain of Hems. On a chalky hill-side we met with *Mathiola Damascena*, not heretofore seen so far north. A little further on *Iris Sari*, so common in Moab, and also found far out in the Syrian Desert. Also the white-flowered *Tulipa biflora*, then a blue-flowered variety of *Iris Palæstina*. Little by little the ground began to assume the characteristics of desert, probably more from want of cultivation than from absolute sterility. As we rode farther to the northward, the peculiar conformation of the Hems Plain, which gave it the name of the "entering in of Hamath," began to unfold itself. Soon we passed the northernmost

spur of Antilebanon, and began to see Lebanon and the valley of Coele-syria. To the north of Lebanon, separated from it by a broad plain, we could see the Nusairy range, while to the north of Antilebanon, and separated from it by the plain eastward of Hems, loomed up the range of hills which shuts in the Orontes Valley to the east. Hems is situated at the junction of the four arms of a cross, formed by the continuous valley of Coele-syria and Hamath, running south and north, and the east and west valleys, which bisects both mountain chains, crossing the other at a right angle.

At 5 p.m. we reached the Muhammedan village of el-Mahin. Having to wait for our train before pressing on to Qaryetein, we called for some bread and lebben. The bread was dark-coloured, and by no means clean, and the lebben was full of dust and goat's hairs. Nevertheless, we ate with the keen appetites of travellers, and, at 5.30 p.m., mounted and faced eastward towards the desert. Notwithstanding the brigandish look of our hosts they refused backshish for the provisions furnished, and bade us God-speed on our way.

We had been gradually descending all the way from Yebrúd, and still our path lay downward by a gentle grade over a rolling plain to Qaryetein, three hours from el-Mahin. We left the last ploughed fields on turning our backs on this village, and passed no more arable land or water until we reached Qaryetein. Half an hour from el-Mahin I collected quantities of *Silene coniflora*, characterised by its pink-purple flowers and the prominent white crown at the throat of the corolla. The moon rose full over the range of mountains to our right. By its brilliant light we saw a carriage track, which we followed all the way to Qaryetein.

The streets of Qaryetein were turned into a putrid marsh by late rains. We passed through the silent town, and at 9 o'clock p.m. knocked at the outer gate of the teacher's house. There was no response, and the gate being locked, we had no resource but to wait until one of the muleteers hunted up the proprietor, and brought him from the other end of the town. When he returned, however, he gave us a most hospitable reception. His wife immediately cleared out two of the three rooms of which the house is composed, and placed them at our service. The room which we occupied was large and clean, and contributed not a little to our comfort for the two nights and the day which we spent there.

Qaryetein owes its importance to the fact that it is the border town of the desert proper, and a necessary stopping place for all who go from Damascus to Palmyra. There are two sources of water in the town, one the wells which are found in the open court of each house, and the other the fountain at some distance from the walls. A supply of water for irrigation has been obtained by extensive trenches about twenty minutes east of the town, and a more meagre one at Mar Lián by similar means. The trench of Mar Lián runs back to an underground aqueduct, which is tapped every few yards by shafts similar to those noted at Ma'arrâh.

Qaryetein is governed by Fayyad Agha, the chief of a family, which has ruled this district in a feudal way for many generations. He has the reputation of being an arbitrary governor. We, however, experienced nothing but politeness at his hands. He called on us, and gave us all the information we desired in regard to the desert, among other things giving us an itinerary which made it unnecessary for us to carry water, as is usual on this journey. When we returned his call he showed us a number of interesting pieces of sculpture, with Palmyrene inscriptions on them. He told us that he proposed to form a small museum of such objects. He called the Palmyrene character *Serankili*, by which he probably meant *Estrangelo*.

Sunday, April 6.—9 a.m. Barometer, W., 27.18, B., 27.4; height, W., 2,660, B., 2,600; mean, 2,630 feet. We held divine service in the house of Mr. Yusuf Shahin, the teacher, and after that a clinique for the sick folk of the village who chose to come for treatment.

During our stay in Qaryetein a pretty piece of sculpture was brought to us, and offered for sale. It consisted of a slab of argillaceous limestone, 24 inches long, and 18 broad. Most of the Palmyrene busts are cut out of this stone. The accompanying sketch will give an idea of the style of the sculpture, which was far superior to any others which I saw. The drapery is graceful, the tiara and jewellery are carved with care, and the attitude is easy and natural. The face of the original must have been one of rare beauty (p. 27).

The accompanying copies of squeezes taken from the inscriptions show the kind of legend which is found on all the busts and statues of Palmyra.

On my second journey to Palmyra, in July of this year, I was fortunate enough to obtain the bust itself. There are manifest faults in the sculpture, but the general effect is pleasing.

Monday, April 6.—6 a.m. We started in the cool of the morning for the desert. Our road lay at first through the walled gardens, and then through open irrigated fields. In these fields I found *Astragalus conduplicatus*, *Salvia controversa*, and *S. Verbenaca*, *L. var. vernalis*; all new for this region. Twenty minutes from the town we came to the series of trenches above alluded to, about 15 feet deep, and at the bottom there was a small stream of water. The labour with which these deep trenches are excavated shows the value attached to even small quantities of water in this thirsty land.

The part of the Syrian Desert on which we were entering consists of a series of mountain chains, trending nearly east and west, and separated by broad, almost level plains. The mountain masses are composed of the Lebanon cretaceous limestone, and the plains of mud and clay, with here and there an island of sand. The whole district seems to be underlaid by a layer of asphaltic shale. The well at 'Ain-el-Bieda is strongly impregnated with sulphur. The surface spring at el-Jebâh is also sulphurous. The fountains at Palmyra are very strongly so.

The highest peaks of the mountain chains are not less than fifteen

hundred feet above the surface of the plains. The chains begin at the longitude of Qaryetein, and end at that of Palmyra. Their length is therefore about 50 miles. The southernmost is wholly denuded of trees, and, with the exception of a few scattered specimens of *Rhamnus Palæstina*, I found no shrubs growing in the crevices of the rocks. The plains, notwithstanding their level appearance, fall gradually to the east-



ward. By one of our barometers Palmyra is 1,300 feet and by the other 1,180 feet lower than Qaryetein. The water which falls on them, and flows into them from the adjacent mountains, sinks into their surface. Not a single torrent flows out of them, even during the heaviest rains.

The soil is a greyish marl, with occasional out-croppings of glaring white chalk. Flint chips and nodules abound in many places over its

surface. There are, however, many levels, where for miles there is not a pebble on the ground.

In comparing these plains with those of the maritime districts of Sinai and the plateau of et-Tih. I was struck with the absence of the broad and deep torrent beds which characterise the southern deserts. While crossing the space between Palmyra and the military post of 'Ain-el-Beida, a violent thunderstorm broke over the line of our march, about an hour ahead of us. When we arrived there an hour later we found an area of ten miles square, over which we had passed dryshod two nights before, a vast morass, in the mud of which our horses' hoofs sank to the fetlock joint at every step. The Wadi-el-Bâridi, which we crossed during our first day's journey, and in which we encamped, was the deepest water-bed that we encountered. It was only a few feet below the level of the plain.

The vegetation of these plains differs widely from that of the Sinaitic valleys and of the plateau of the Tih. I met with only one species of *Tamarix*, *T. tetragyna*, and that, not growing as in Sinai and the Tih to the height of a small tree, but forming little clumps of shrubs scarcely a yard high on low sandy hummocks. On similar hummocks grows also *Lycium Barbarum*, but does not rise above two or three feet. Not an *Acacia* diversifies the landscape; not a *Retem* offers even its light shade to the sunburnt traveller. Only one *Zygophyllum*, *Z. eurypterum*, reminds one of the numerous species of that genus in the southern deserts. There is not a solitary *Caper*, nor any other of the numerous shrubs and trees which give so decided and peculiar a character to the landscape of the Sinaitic valleys and the Tih. Only in the Wadi-el-Bâridi did I see anything approaching a tree. Near our camp in that wadi were a few stunted trees of *Pistacia mutica*, a tree which we afterwards found in great abundance in the mountains of Jebel-el-Abiad and Bil' âs. There is every reason to believe that these mountains would support forests of *Quercus coccifera*, or other of the trees that flourish in regions equally dry, but if they formerly existed they have disappeared. There is not even a tall herbaceous vegetation on the plains. The low desert grass, *Poa bulbosa* (and its congener or variety *P. Sinaitica*), forms, for miles together, almost the sole vegetation, and when it has dried up in summer, it leaves those portions of the desert dreary indeed.

At the season when we travelled there was much grass and a considerable number of flowers, some of them beautiful. *Iris Sari* is abundant on the western half of the plain, between Qaryetein and el-Beida. On the slope of Jebel-'Ain-el-Wu'âl, I found a new variety, *var. amblyophylla*, of *Tulipa montana*. The divisions of the perianth are obovate-oblong, obtuse. A pretty *Erysimum*, with purple flowers half an inch broad, is found everywhere, appressed to the ground. It is the species named by Boissier, in his "Supplement to the Flora Orientalis," *E. Blancheanum*. It had been named by Blanche himself *E. hamosum*, on account of its hooked pods. I have seen his type specimens in his herbarium at Beirut. But I am satisfied, by an exhaustive study of the species in the Anti-

lebanon plateaus, throughout which it abounds, and in the whole desert region through which we passed, where it is one of the most characteristic plants, that it is a variety of the polymorphic *E. purpureum*. I propose for it the name *var. Blancheanum*, of the above species, in memory of the lamented M. Blanche, to whom M. Boissier dedicated the new, but indefensible species.

Among the showy flowers of the desert at this season are *Ornithogalum montanum*, *var. platyphyllum*, a fine species, with inch-and-a-half broad flowers. *Sisymbrium grandiflorum*, Post, is a species with orange-coloured to pale yellow flowers, as large as the common *Stock*. This plant is general through the western part of the plain. I have it also from Aintâb. *Brassica deflexa*, also an orange-flowered crucifer, is found sparingly in rocky places near the western limits of the plain.

Where the desert grass, *Poa bulbosa*, and *P. Sinaica*, grows in quantity, it gives large tracts of the plain the appearance of greenness and fertility. Tufts of *Artemisia Herba-alba* cover also large tracts, and give an olive-green tint to the surface.

Characteristic of the region, although less abundant and showy, are *Alyssum aureum*, *A. menioecoides*, *Valerianella Kotchayi*, *Malcolmia crenulata*, *M. torulosa*, *Peganum Harmala*, the latter not yet in flower when we passed. Everywhere we saw young plants of *Ferula Blanchei*, Boiss., which is also met with between en-Nebk and el-Mahîn.

Of great botanical interest are certain plants with a limited range. For example, in the green meadows surrounding the wells of Abul-Fawâris, half an hour west of Palmyra, was a great abundance of *Hutchinsia petraea*, a new plant for Syria. In the swampy district, a hundred square miles of territory were covered with *Spinacia tetrandra*. In the same swamps were found *Cynomorium coccineum*, and *Phelipea lutea*. In the middle region of glaring white clay I found the new and showy *Muscari albicaule*, Post.

It is my conviction that artesian wells would convert the whole of the plain into a fruitful field. Many portions of it need only to be ploughed and sown to produce fair harvests, even with the scanty rainfall there enjoyed.

The Fauna of the desert is limited. The fox, jackal, hyæna, hare, jerboa, and a few species of snakes and lizards, were all the animals we saw. The birds are mostly clad in sober grey, like the soil. Except vultures and hawks, and the hubarab, we met with no birds of any size during this journey. We afterwards found abundance of partridges and other game birds in the Bil-âs chain.

To return to our journey. As soon as we had passed the trenches east of Qaryetein we struck at once the dry plain, and bade good-bye to cultivation until we reached the irrigated gardens and fields of Palmyra. We carried no water with us, as we were to encamp by the Arabs at el-Bâridi the first night, and at 'Ain-el-Beïda the second. Usually, the first night is spent at el-Qaşr, where there is no well, and water must be carried for man and beast.

Presently, after leaving the trenches, we crossed a shallow wadi, in which a considerable stream must flow during the rains, and rode about east across the plain. In this wadi we found *Ethionema cristatum*. On the plain *Ornithogalum tenuifolium*. After a couple of hours we crossed a low ridge, and came into another broad plain between it and the main chain of Jebel-el-Bâridi. In this plain we met with a new species of *Borraginaceæ*, yet unnamed. We also found *Allium Rothii*, which is general throughout the desert.

At 3 p.m. we arrived at the Wadi-el-Bâridi. In numerous basins of white chalk along its bed we found water, which was drinkable, though warm. Along the sides of this wadi was a considerable number of Arab encampments, and their black tents dotted the base of the mountains of Jebel 'Ain-el-Wu'ûl for several miles to the eastward. We pitched our tents by that of Sheikh Ramaḍan, the chief of the Fawâ'irah, a tribe of tributary Arabs.

As soon as our train began to unload R. and myself rode southward for an hour and a half to the mountain range. The ground became more and more broken by wadies as we approached its foot. On a rocky hillside we collected *Zygophyllum eurypterum*, a species thus far found only in the Syrian desert. Just before commencing the ascent of the mountain we passed a second encampment of the Fawâ'irah. Our guide Khalid remained with these Arabs while we rode up the hill. Halfway up we encountered the *var. amblyophylla* of *Tulipa montana*, with a most brilliant crimson perianth. At the top, in crevices of the rocks, *Umbilicus Libanoticus*, and everywhere *Erysimum purpureum, var. Blancheanum*. A few bushes of *Rhamnus Palestina* were scattered over the hillside. The soil was still quite moist from the recent showers. I believe that it would ripen a crop of wheat or barley.

The part of the ridge which we ascended is 200 or 300 feet lower than the highest peaks. The barometers stood W. 26°23, B. 26°42, giving the height by W. 3,650 and B. 3,600 feet above the sea. The difference of level between our camp in the plain and the top of the ridge at the point where we took our observations was by W. 910 feet.

The view from this mountain top was very grand. Wave after wave of mountain ridges rolled away over the desert plain, which at this season still appeared green. The plain in which our camp lay is not less than 30 miles broad at its western end, and gradually narrows to the throat of the gorge at the entrance to the street of tombs at Palmyra. From our position we could make out quite clearly the castle on the hill west of Palmyra. El-Qasr loomed up in sharp outlines in the middle of the plain, two hours north of our encampment.

On the slope of this mountain, a little north of our line of ascent, is the perennial fountain of 'Ain-el-Wu'ûl. The marauding parties of Arabs avail themselves of it during the whole year.

After enjoying, as long as our time would allow, the extensive prospect and the cool breeze, we descended to the plain. While leading my horse down the steepest part of the hill, my overcoat slipped off the

saddle. I offered a reward for its return, but either the Arabs did not find it, or thought the coat worth more than the reward, and I never saw it again. Such a loss is no trifling one in a journey where there is no way of replacing the lost article. Fortunately, however, our journey was not in the season of the bitter cold winds which often sweep over these deserts, and no ill consequences followed the loss.

We galloped over the plain, and just before sunset reached our tent. The barometers read as follows :—

7 p.m., W. 27.12 ; next morning, at 6 a.m., 27.2.

B. 27.72. " " 27.8.

Height, W. 2,740 ; B. 2,300.

I am unable to offer an explanation of the discrepancy between the relative readings at the top and on the plain, nor in fact for the idiosyncracies of aneroids in general.

Tuesday, April 8.—At 6 a.m., we started across the plain in an oblique direction toward 'Ain-el-Beïda. The roll of the plain is very gentle, and yet very decided. The soil is for the most part white, free from stones, and barren. Nevertheless, during the day we found *Zizyphora tennior*, *Lallemantia Royleana*, *Wall* (quite new for this region), *Arnebia cornuta*, and *Muscari albicaule*, *Post*, a new species, notable for its white stems and long peduncles. Seven hours of this prairie brought us to 'Ain-el-Beïda.

This military post was established by the Turkish Government a few years since for the protection of the road from Qaryetein to Palmyra, a road travelled by large caravans of merchants and travellers. The well seems ancient. It is over 80 feet in depth, and the curb and lining stones are deeply grooved by the ropes used to let down the leathern buckets. These buckets are composed of the untanned skins of cattle and goats. They are of the shape of an ordinary fleshpot, the mouth being a loop of wood or iron, around which the skin is rolled and sewed. The thong by which the bucket is held is of raw hide. The advantage of such a bucket over one of wood is made clear to anyone who watches how it sways to and fro, and strikes the uneven side of the well on its way up and down. A wooden bucket would soon be broken to pieces by such usage. The skin bucket, moreover, can be packed away in a very small space, and carried conveniently on a mule or ass. The water of this well is brackish, but seems wholesome. It is quite cool.

The building, which serves as a barracks for the small garrison of soldiers, consists of a lower storey about 50 feet square, and a single, small room upstairs. The gateway is on the south side, opposite the well. There open into the central court, several vaulted chambers, which are used as stables and store-rooms. A rude stairway leads to the roof. Over the doorway is the small upper room above-mentioned. It is occupied by the soldiers as a sleeping room, and a watch-tower from which to observe the adjacent desert. There is a wall breast high around the roof, loopholed for musketry.

The five men of the garrison, by virtue of the authority which they represent, rather than the impregnability of their position, constitute a guard sufficiently strong to overawe the hordes which occasionally sweep through this plain on their lawless raids. I took down their names; they are as follows: 'Abd-el-'Assâf (Servant of the Autocrat); Ḥamod-es-Şâliḥ (Praise of the Righteous One); 'Abd-el-Aghla (Servant of the Most Precious); Şâliḥ-el-'Ali (Righteous of the Lofty); 'Abd-Maḥmûd (Commended Servant). One of these was a negro, but there seemed to be no race prejudice among them. Another was a Bedawi, and from him I obtained much valuable information, which I hope to lay before the readers of the *Quarterly* hereafter.

At Qaryetein we had made the acquaintance of an assistant of the Attorney-General of Bagdad, who had been in Damascus, and was travelling overland to Bagdad in a palanquin, borne by two mules. It was so arranged that he could lie stretched out at full length on the bed, or sit up and look out of the windows on all sides. It was painted with scarlet, and formed a very conspicuous object in passing along the plain. This official had started at the same time as ourselves from Qaryetein, but had gone by way of el-Qasr, where he rested during the afternoon and evening hours, and then came on by night to el-Beïda. This mode of travelling is adopted for the double purpose of safety from the Bedawin and escape from the fervid heat of the day. We found him at the station on our arrival at 1 p.m. We arranged to join forces at sunset, and make a night march to Palmyra. Our two caravans made the imposing array of sixteen animals and fourteen men. To encourage our muleteers and attendants to undertake this night march we gave them a bowl of strong tea all around, and promised them a lamb the next day at Palmyra. Accordingly, after resting through the afternoon, we formed in close order of march, and started at dusk. As yet the moon had not risen, and even the stars were obscured by clouds. Our only guide was the dark outlines of the converging ranges of mountains to the right and left. Palmyra lies at their meeting point. By keeping our faces toward the castle, which looms up over the Palmyra notch, we were able to hold our way over the level plain. Not infrequently our horses recoiled from the edge of some little pool of water, often not over a yard broad, and a few inches deep, which had been left by some recent shower. On our return over the same route by day, we saw many such pools, and large districts wholly under water, but a few inches however in depth.

As we approached the throat of the valley of tombs the tall towers of the dead loomed up on either side of the way. The moon, which had risen at half-past eight o'clock, now guided us over the rocky road, and caused the sepulchral monuments to stand out in bold relief. Presently we turned a corner in the path, and the wonderful panorama of Palmyra unrolled itself before us in the misty moonlight. It was one o'clock in the morning when we reached the street of columns. Silently as we had ridden in, the Sheikh was soon with us, and invited us to lodge with him. We preferred our freedom, and pitched our tent just within the

eastern gateway of the street of columns, and by half-past two we were sound asleep.

Wednesday, April 9, Palmyra.—Barometer, 7 a.m., W. 28·2 B. 28·6 giving the height by W. 1,680, and by B. 1,300 feet above the sea. The morning was bright, and our first thought was naturally the survey of the ruins. Although less massive than those of Baalbek, the general effect is more striking and impressive. No street of columns like this exists elsewhere, not even in Gerash, and the effect when the row was unbroken, and the monumental building at the western end was perfect, must have been extremely imposing, from whatever point seen. Not less so was the grand Temple of the Sun, which for general impression well rivals that of Baalbek.

The most striking view of the ruins is that obtained from the castle on the hill west of the city. The castle itself is a most picturesque ruin, and is visible to a distance of twelve to fifteen hours on the western plain, and as far as the eye can reach on the eastern. The ascent to the castle is from the south, along the old road. A horse can easily go up from this side.

In the foreground of the view from the castle is a line of pits, from which have been dug out many sculptures and other antiques. Beyond these are the remains of the several buildings, with well-preserved pillars, then the great double row of columns, beginning with the edifice usually considered as a tomb, and ending at the beautiful gateway where our tent was pitched. Branching from the main street near its centre is the side street of columns, the so-called market-place. Beyond the street of columns is the majestic Temple of the Sun, and far away behind it the glittering waters of the Sebkha (the salt lake of Palmyra), and behind that the boundless plain of the Syrian desert.

On either side of the street of columns are the ruins of the numerous temples and mausoleums of the city. Around the whole may be traced the remains of the wall of Justinian. To the southward, along the flanks of the hills, and in the valley of tombs are the sepulchral towers, which are so peculiar in this land of wonders. No ruined city in Syria and Palestine, except Jerusalem, has such a point of view from which to take in a complete idea of its grandeur.

The immediate site of Palmyra is sandy. Many of the fallen columns are embedded in white sand, and the Flora of the ruins takes its character from this circumstance. I collected among the fallen columns *Leptaleum filifolium*, *Silene coniflora*, *Holosteum umbellatum*, *Spergularia diandra*, *Malva parviflora*, *Erodium laciniatum*, *E. glaucophyllum*, *Medicago tribuloides*, *Trigonella azurea*, *T. filipes*, *T. Arabica*, *Astragalus cruciatus*, *var. brachylobus*, *Post* (a variety with tubercled hairs on the short pods), *A. callichrois*, *A. Forskahlei*, *Aizoon Hispanicum*, *Matricaria aurea*, *Carduus pyenocephalus*, *Kelipinia linearis*, *Statice spicata*, *Anchusa Milleri* (?), *Lithospermum tenuiflorum*, *L. arvense*, *Linaria Ascalonica*, *var. brachyloba*, *Post L. albifrons*, *Plantago albicans*, *Muscari racemosum*, *Belle valiaflexuosa*, *Gasea foliosa*, *Vulpia pectinella*, *Scleropoa Memphitica*, *Nardurus tenuiflorus*, *Bromus Matritensis*, *Aegilops crassa*.

At an early hour in the morning Sheikh Asaad came to pay us a visit, and bring me a lamb as a thankoffering. Eleven years ago he was shot by a Palmyrene, during an armed contest over the election of the present Sheikh of Palmyra, Mohammed Abdallah. The ball passed through the pleura and injured one of his ribs. When he arrived at the Johanniter Hospital at Beirut he was in a pitiable condition. A native quack had introduced into the wound bits of rags as tents for drainage. These had slipped one by one into the chest, and, by their increasing fetor, had brought about an irritative cough and fever, which had nearly worn out his strength. When the wound was laid open to remove these, the fissure between the lobes of the lung could be seen back to the roots of the lung, and the mechanism of expansion and contraction of the organ clearly made out. He was entirely cured at the hospital, and returned with a profound sense of gratitude to the friends whom he had found so far away. He showed his gratitude, not only by bringing the lamb, but by remaining as a guard of honour at our tent during our stay, and by giving us much information about the people and the homeward route.

In the afternoon I took a comprehensive ride about the city, outside the cultivated fields. Beside gaining many interesting views of the city, I found at the edge of the wheatfields. *Malcolmia Bungei*, var. *glabrescens* (new for Syria), *M. Africana*, var. *squarrosa*, *Oleome glaucescens*, *Helianthemum Niloticum*, *Silene Olivieri*, *Onobrychis Olivieri*, *Asperugo procumbens*, *Veronica triphyllus*, *Isiolorion montanum*, *Muscari racemosum*, *Belvaldia flexuosa*.

The fields and orchards are irrigated by water from four different aqueducts. The largest stream is that flowing from the great fountain, south-west of the ruins. The next is that which runs along the south wall of Justinian, and turns northward near the bend in the street of columns, and runs beyond the northern limits of the ruins. At two points on this aqueduct the owners have constructed staircases leading down to the water for the convenience of the villagers, who draw most of their water supply from this source. The owners, the Sheikhs Mohammed Abdallah, Abdallah Salim, and As'ad el-Faris, bought this aqueduct of the government for fifty Turkish liras, and cleaned it out at an expense of two hundred more. Until this was done, two years since, all the village supply of water was drawn from the great aqueduct, outside the walls. It is interesting to watch the erect carriage of the women as they walk along, spinning or swinging their arms, and often turning their necks and heads as they chat with one another, while they carry a jar with sixty pounds of water on their heads, never so much as touching it with a finger, however violent the wind may be. I asked one of the Arabs how they learned to do this. He replied that it is a matter of coquetry with them to carry a jar gracefully, and that they practise with much care from childhood to acquire a knack which commends them to the favourable notice of admirers of the other sex.

There are two other canals which have been cleaned out, and supply water for irrigation. The Sheikh of the village assured me that there

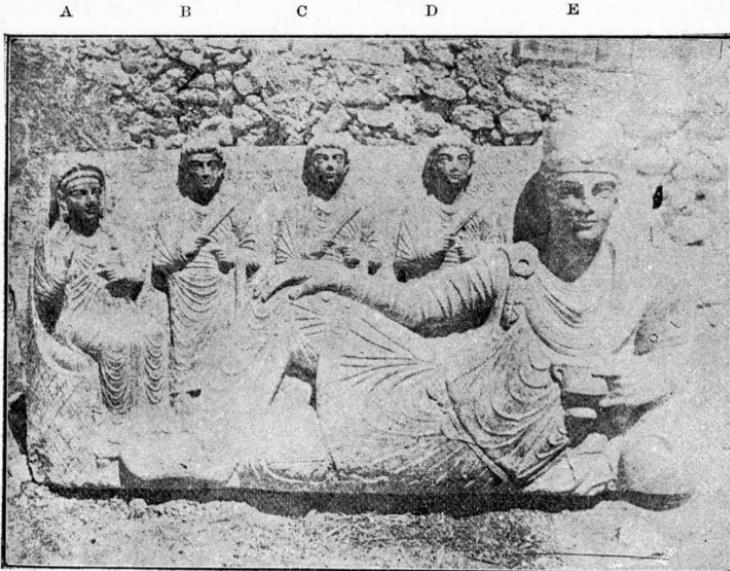
were several more to the north of these. They are all ancient conduits, and indicate a copious water supply for the city. Sheikh Mohammed assured me that the wells of Abul-Fawâris, half an hour west of the city, are also on the line of another aqueduct, large sections of which are to be seen along the valley of tombs.

To regulate the apportionment of water, a man stands at one of the street crossings in the Temple of the Sun, with an hour-glass in his hand, and takes the time allotted to each proprietor along the line of the public canal. The tidings of the expiration of the time are communicated by a call from the roofs of the houses.

The large canal, which is public property, is open from the point of its emergence from the natural tunnel out of which it flows. The others are covered, and lie at a depth of from ten to twenty feet below the surface.

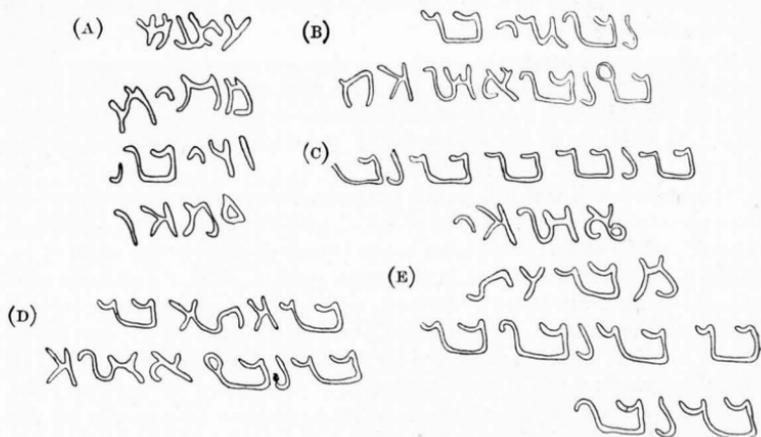
During the day we bathed in the great spring. It was a strange sensation to swim away into the darkness and find the water growing deeper and deeper the farther we penetrated, until it was far above our heads. We did not dare to swim very far into the heart of the mountain, lest the sulphurous vapours might cause asphyxia when beyond the reach of help.

A horde of people pressed about us with copper coins, mostly of the Turkish and Cufic mintings, with a few of Greek and Roman date. All



were in the state of defacement so often noted in Palmyrene coins, attributable to the sulphurous emanations from the soil. They also brought us a few clay scarabei and seals, and many squares of clay, about the size of one and two drachm weights. These are supposed to have been used as money. The impressions taken from two varieties may serve as

illustrations of the smaller kinds. One of a larger size and different shape was brought to me. An imperfect scarabæus, apparently Assyrian, was also brought. It has a winged lion with a female head.



The Mudir has a small collection of busts of rather inferior workmanship. He had, however, a large stone in front of the school-house, which he ordered to be turned face upward for our benefit (p. 35). It seems to be the father and mother of a family of three children. I took squeezes of the inscriptions, which are between the heads of the figures, copies of which are given above. The photograph was



obtained at a subsequent visit. The stone is about 5 feet long by 3 broad. The mother is represented smaller than the boys, following the conventional ideas of Oriental artists.

I secured a head in a sufficiently good state of preservation to show the headdress and coiffure, and the Palmyrene type of features, as also the



earrings and necklace, as seen in the accompanying cut taken from a photograph.

I also sketched a male bust, which gives the characteristic cut of the hair, and the arrangement of the drapery, as found in all the male



figures I saw. The characters of the inscription differ by their simplicity from those of the other tablets.

The workmanship is coarse, and the stone soft, and unsuitable for statuary. The greatest misfortune of Palmyrene architecture and art was the want of a suitable stone, in which to express the ideas of their time. The building stone is a limestone, full of veins and cleavages, so that it was almost impossible to carve a perfect Corinthian capital out of it, and the influence of the wind and sun and rain is seen in the defacement and almost destruction of a large number of elaborate details, which were undertaken in spite of the discouraging material. The statuary is chiselled out of a soft argillaceous limestone, easily cut, but as easily defaced, and incapable, like marble, of taking the finer expression which Greek and Italian marbles are so well adapted to receive and retain.

In the middle of the afternoon the clouds rolled up heavily from the west, and a few drops of rain fell. It, however, cleared up enough to enable me to complete my study of the environs of the city. At night we piled our collections in the middle of the tent, and covered them with all our available sacks and the tent carpet. It was well that we did so, as we had a series of smart showers in the night, and the rain sifted in more or less through the tent. None of our plants were injured, thanks to the precautions taken.

The chains of *Jebel 'Ain-el-Wu'ûl*, and *Jebel-'Antar*, and the other mountain ranges parallel to them, or forming angles with them, terminate, at the longitude of Palmyra, in a somewhat continuous chain, trending somewhat east of north. From the foot of this chain the great plain of the Euphrates stretches away to the east, with scarcely a knoll to break the vast expanse. An hour's distance from Palmyra is the *Sebeka*, which we explored during our subsequent visit. At the time of the present visit it was a lake several miles in length and breadth.

Thursday, April 10, Palmyra.—After a rainy night, the clouds rolled off, and the sun came out at about 10 a.m., with promise of a fair day. We immediately broke camp and started on our westward journey at 11 a.m. We took in the picturesque Turkish castle on the hill, and the tombs in the valley on our way. The view from the edge of the moat over the city is very fine. Doubtless that from the top of the castle is finer, but we did not think it worth the trouble of clambering up the rocks to the foot of the wall to obtain it.

After lunching in the shadow of the aqueduct near the western end of the valley of tombs, we visited the wells of *Abul-Fawâris*, half an hour west of the town. We found the water sweet and cool. It flows from one well to another by an aqueduct, about twenty feet below the surface. Although we did not take the level by barometer, there is no reason to doubt the correctness of *Sheikh Mohammed's* opinion, that this aqueduct was continuous with that in the street of tombs. As before mentioned, it is intended to re-establish the connection with the part of the aqueduct in the street of tombs, and lead the water again to the town. The ground about these wells was moist, and bore at the time an abundant crop of green forage, on which a herd of cows was feeding as

we passed. Among the plants growing in this meadow were *Hutchinsia petraea* (new for our district), *Onobrychis Olivieri*, *Tetradiclis Salsa*, and a species of *Astragalus* allied to *A. bombycinus*, perhaps a variety of it.

Three-quarters of an hour farther on we passed a hill fifteen minutes north of the road, on which we saw ruins. I rode up the hill and found the pedestal and capital of a column, but no shaft anywhere in sight. There were no other ruins. It is interesting to speculate whether the shaft was ever brought to the spot. It could not be easily hidden on a conspicuous hill like that on which the base is erected. There would be no motive to remove a shaft elsewhere. Unfinished monuments are very common in the East. There was no inscription to give any hint as to the date or purpose of these remains.

Immediately after passing this hill, we saw a heavy, black cloud gather an hour ahead on our path, and the play of lightning and rolling of thunder made us sure that there must be almost a waterspout at the theatre of the storm. The cloud, however, soon rolled away over the range of Jebel-'Ain-el-Wu'ul, and two hours later we were wading in a suddenly-formed swamp, in water in some places 3 inches deep, where two days before we had passed over a desert baked and cracked by the fierce sunshine. This great salt marsh, covering about a hundred square miles, was overgrown with *Spinacea tetrandia* (not before noted in Syria), with here and there mounds, on which grew clumps of *Tamarix tetragyna* and *Lycium Barbarum*. In the most swampy places we met with the curious spike of *Cynomorium coccineum* and *Phelipea lutea*.

In the middle of the swamp we met with three bases of columns, or altars. Two were entire, the third had only the sub-base. At a distance of a hundred yards to the west was a portion of a pillar, half buried in the soil. As we photographed these bases at a subsequent visit, and copied the inscriptions, I will reserve further comment on them for the narrative of that journey.

We arrived at el-Beida at 6 p.m., after a ride of five hours from the street of tombs at Palmyra.

Friday, April 11th, 'Ain-el-Beida.—At our previous visit, three days before, our barometers had read W. 27·8, B. 28·2. They now read W. 27·87, B. 28·45. The mean will give by W. 1,970 and by B. 1,700 feet above the sea.

Heights above Mediterranean Sea.

	Watson.	Browning.
Damascus	2,325	2,325
Maarca	4,200	4,200
"	4,200	4,200
Ridge ab. Ma'lula	5,500	—
Yebrud	4,550	4,600
"	4,525	4,525
Deir Atiyah	4,000	4,025
Qaryetein	2,660	2,600

Heights above Mediterranean Sea—cont.

	Watson.	Browning.
'Ain el-Wu'ûl....	2,740	2,300
Top of Mount near Wu'al ...	3,650	3,600
'Ain-el-Beïda	1,940	1,800
"	2,000	1,600
Palmyra	1,480	1,300
El-Jebâh	2,550	2,285
Abu Dâli	2,070	2,170
Hems	1,625	1,770
Hadidah	1,500	1,525

These are given without any allowance for temperature, and on the assumption that the instrumental error of each was constant.

A cold and dense fog covered the plain when we arose. We could not see a hundred feet away. Nevertheless, our guides decided that we could march, and we made an early start. For two hours the mist continued without a sign of breaking but by 10 a.m. it had rolled entirely away. At 11 we began to see figures moving along the south-western edge of the plain. At first our guides were uneasy, suspecting that it might be a marauding party, but it soon became evident that it was a large tribe in motion, with all its flocks and herds, migrating in the direction of Hems and Hamath. A little before noon our line of march crossed theirs, and we had some conversation with those whom we met. This tribe migrates in this direction every spring, to pasture the broad fields of the Orontes Plain after the harvest is over.

During the middle of the day the most characteristic plant which we found was *Ferula Blanchei*, a low species of that genus, about 18 inches high, called by the natives Abu-et-Ṭayyib. At the time of our journey the stalks were just coming into flower, and were quite tender and succulent. Our muleteers and guides stripped them of leaves, and ate freely of them. We tasted them, and found them not unlike celery. Doubtless they would make a very good salad, and also be palatable boiled, and served with a sauce, like asparagus. We also collected *Scorzonera lanata*, *Hyoscyamus muticus*, *Asphodeline brevicaulis*, beside other plants before mentioned.

For several hours in the middle of the day we were in sight of el-Qasr, which we passed a little after noon, two hours to the south of our route.

At about sunset we passed a small salt pool, among rugged hills, and at 7.30 p.m. reached el-Jebâh, where there is a perennial stream a foot or so in width, and 2 or 3 inches in depth. We had been told that there was a river at Jebâh. There is, in point of fact, a torrent bed by the hamlet, but it only runs during heavy showers. Great is the value of the tiniest rill in this parched land. It was quite dark before we had our tent pitched and our supper eaten, and we lay down to a rest earned by thirteen and a-half hours of hard work.

Saturday, April 12th, El-Jebâh.—6 a.m. Barometers, W. 27.3, B. 27.72;

height, W. 2,550, B. 2,285 feet—a little lower than Qaryetein, a fact verified subsequently.

Arriving as we had done the night before, at dusk, we obtained the impression of a village, an impression not borne out by the three or four miserable ruins of huts which we saw in the morning. We found, however, a field of wheat, of about 2 acres in extent, which is irrigated by the rill beside which we were encamped. Three old men live here to sow, tend, and reap this little Eden. And out of it they not only get their own support, but give half of the produce to Fayyad Agha of Qaryetein, who is the owner. We could not have had a more forcible commentary on the small value of human labour here than was furnished by this fact. In July, when we passed another night at el-Jebâh, we found these three old men threshing out the produce of the field, and irrigating some summer crops which they had planted.

The water at el-Jebâh has a decided odour and taste of sulphur, but much less pronounced than that of el-Beïda and Palmyra.

At an early hour we broke camp, and rode for two hours to el-Ghundhur, a wretched village at the edge of the desert. A ruin of Roman or more ancient times exists here. Only the lower courses of stone, however, are in place. The other material seems to have been pretty well broken up to build the village. Two copious springs of good water serve not only for drinking places, but to irrigate a considerable area of cultivated ground.

As we had now cleared the desert, we dismissed Khalid and Mohammed, our guards and guides through the wilderness. They returned to Qaryetein, three hours away, while we pursued our journey to es-Saït, six hours to the north-east of el-Ghundhur. Our path lay over rolling, barren hills, which were not at that time utilised even for grazing. We passed a number of dolmens by the way, but all of rude construction and apparently modern.

At es-Saït we came upon the first traces of grain growing without any irrigation, a fact which indicated that we had come within the sphere of regular and reliable rains. On our way from el-Ghundhur we had occasional floral evidence that we were passing from the desert to the fertile regions. *Allium Orientale*, *Astragalus Mitchelli* Post (a new species with pretty violet flowers, growing in great abundance), and *Camelina lasiocarpus* introduced us, and after passing es-Saït we rapidly came one by one to the familiar plants of Coele-syria and the Hems tableland; *Onobrychis Sativa*, *L. var Montana*, *Alkanna strigosa*, *Veronica Orientalis*, *Salvia acetabulosa*, and, above all, *Asphodelus microcarpa*, the universal plant of the upland prairies as well as of the coast.

From es-Saït to Abu-Dâli we passed for three hours over a rolling park-like country, more and more cultivated with broad and fertile wheat fields. We reached Abu Dâli at 9 p.m., after a fourteen hours' ride, and were glad to look forward to the rest of the coming Sabbath, and the end of our desert journey.

On Monday we passed through Hems, and on Tuesday afternoon reached Tripoli, whence we returned by steamer to Beirút.

The following is a list of the plants collected during this journey. The italicised words are the names of plants new to this region. Those in small capitals of new species:—

I.—RANUNCULACEÆ.

1. *Adonis dentata*, Del. Syrian desert, common.
2. *Ranunculus Damascenus*, Boiss. et Gaill. Damascus.
3. *Ceratocephalus falcatus*, Pers., var. *vulgaris*, Boiss. Common on the Damascus plateau and in the desert.
4. " " var. *exscapus*, Boiss. Damascus plateau.

II.—PAPAVERACEÆ.

5. *Glaucium Arabicum*, Fres. Qaryetein to Wadi el Bâridi.
6. *Rœmeria hybrida*, Sih. Desert.
7. *Hypecoum grandiflorum*, Boiss. Common in the desert.

III.—FUMARIACEÆ.

8. *Fumaria micrantha*, Lag. Damascus.

IV.—CRUCIFERÆ.

9. *Matthiola Damascena*, Boiss. Yebrûd to el-Mahîn.
10. *Arabis albidâ*, Stev. var. *umbrosa*, Boiss. Ma'arrâh to Yebrûd
11. *Aubrietia Libanotica*, Boiss. Rocks near Yebrûd.
12. *Alyssum montanum*, L. Yebrûd.
13. " *campestre*, L. Common everywhere.
14. " *calycinum*, L. Jebel Qalamûn.
15. " *dasy carpum*, Steph. Nebk to Qaryetein. Desert.
16. " *aureum*, Fenzl. Qaryetein to el-Bâridi.
17. " *meniocoides*, Boiss. Nebk to Qaryetein. Desert, common.
18. *Chrysochamela velutina*, D. C. Desert.
19. *Erophila minima*, C. A. M. Yebrûd. Desert.
20. " *præcox*, Stev. Desert.
21. *Malcolmia Bungei*, Boiss. var. *glabrescens*, Boiss. Palmyra.
22. " *Africana*, L., type. Palmyra to 'Ain el Beida.
23. " " var. *squarrosa*, Post. Palmyra.
24. " *torulosa*, Desf., var. *contortuplicata*, Boiss. Desert.
25. " *crenulata*, D. C. Antilebanon and Desert. Common.
26. *Sisymbrium pumilum*, Steph. Yebrûd.
27. " *Sophia*, L. Common throughout.
28. " *runcinatum*, Lag. Wadi el Bâridi.
29. " *GRANDIFLORUM*, Post, Sp. nov. Syrian desert.

30. *Erysimum purpureum*, Auch, var. *Blancheanum*, Post (E. *Blancheanum*, Boiss.). Plateau of Antilebanon and Syrian Desert.
31. *Leptaleum filifolium*, D. C. Syrian Desert. Palmyra
32. *Camelina lasiocarpa*, Boiss et Bl. Es-Satt.
33. *Brassica Tournefortii*, Gouan. En-Nebk to el-Mahîn.
34. „ *deflexa*, Boiss. Qaryetein to el-Bâridi.
35. *Diplotaxis erucoides*, L. Damascus.
36. *Lepidium perfoliatum*, L. Damascus.
37. *Thlaspi perfoliatum*, L. Yebrûd plateau.
38. *Iberis odorata*, L. Damascus plain.
39. *Æthionema cristatum*, D. C. Qaryetein to el-Bâridi.
40. *Hutchinsia petraea*, L. Wells of Abul-Fawâris, Palmyra.
41. *Clypeola jonthlaspi*, L. Qaryetein to el-Bâridi.
42. *Isatis Aleppica*, Scop. Qaryetein to el-Bâridi.
43. *Texiera glastifolia*, D. C. En-Nebk to el-Mahîn.
44. *Chorispora Syriaca*, Boiss. Damascus to el Mahîn.

V.—CAPPARIDÆ.

45. *Cleome glaucescens*, D.C. Palmyra.

VI.—CISTACÆ.

46. *Helianthomum Niloticum*, L. Palmyra. Desert everywhere.
47. „ *vesicarium*, Boiss. Qaryetein to el-Bâridi.

VII.—VIOLARIÆ.

48. *Viola ebracteolata*, Fenzl. Near Yebrûd.

VIII.—SILENÆ.

49. *Silene coniflora*, Otth. Common throughout plateaux.
50. „ *bipartita*, Desf. var. *Olivieri*. Palmyra.

IX.—ALSINÆ.

51. *Holosteum umbellatum*, L. Damascus. Desert. Palmyra.
52. *Alsine picta*, S et S. Damascus to Palmyra.
53. *Spergularia diandra*, Guss. Palmyra.

X.—TAMARISCINÆ.

54. *Tamarix tetragyna*, Ehr. Ain-el-Beïda to Palmyra.

XI.—MALVACEÆ.

55. *Malva Ægyptia*, L. Desert.
 56. „ *parviflora*, L. Palmyra.

XII.—ZYGOPHYLLÆ.

57. *Zygophyllum eurypterum*, Boiss et Buhse. Wadi-el-Bâridi.
 58. *Tetradichis salsa*, Stev. Palmyra to 'Ain-el-Beïda.

XIII.—GERANIACEÆ.

59. *Erodium cicutarium*, L. Qaryetein.
 60. „ *cichonium*, L. Desert.
 61. „ *laciniatum*, Cav. Palmyra.
 62. „ *malacoides*, L. Palmyra.
 63. „ *glaucophyllum*, Ait. Palmyra.
 64. „ *Gaillardoti*, Boiss. Yebrûd to Qaryetein.

XIV.—RHAMNACEÆ.

65. *Rhamnus Palæstina*, Boiss. Jebel-'Ain-el-Wu'ûl.

XV.—ANACARDIACEÆ.

66. *Pistacia mutica*, F. and M. Wadi-el-Bâridi.

XVI.—LEGUMINOSÆ.

67. *Medicago tribuloides*, Dess. Palmyra.
 68. *Trigonella micrantha*, C. A. M. Damascus.
 69. „ *azurea*, C. A. M. Palmyra.
 70. „ *filipes*, Boiss. Palmyra.
 71. „ *Arabica*, Del. Palmyra.
 72. *Astragalus cruciatus*, Link VAR *BRACHYLOBUS*, Post. Palmyra.
 73. „ *callichrois*, Boiss. Palmyra.
 74. „ *conduplicatus*, Bertol. Desert.
 75. „ *tuberculosis*, D. C. Borders of desert.
 76. „ *PALMYRENSIS*, Post. Near Wells of Abul-Fawâris.¹
 77. „ *cretaceus*, Boiss. et Ky. Borders of desert.
 78. „ *mollis*, M. B. En-Nebk to el-Mahfn.
 79. „ *Aleppicus* Boiss. Damascus plain.
 80. „ *Forskahlei*, Boiss. Desert. Palmyra.

¹ Perhaps a variety of *A. bombycinus*, Boiss.

81. *Astragalus* MITCHELLI, Post. Sp. nov. El-Jebâh to el-Ghundhur ;
Es-Sait̄.
82. „ *ancistrocarpus*, Boiss et Haussk. Desert.
83. „ *angulosus*, D. C. Chalk hills north of Damascus.
84. „ *Trachoniticus*, Post. Syrian Desert.
85. *Onobrychis sativa*, L. var. *montana*, Boiss. Border of desert.
86. „ *Olivieri*, Boiss. Palmyra.
87. *Vicia Noñana*, Reut. Hems to Hadidah.

XVII.—ROSACEÆ.

88. *Cerasus microcarpa*, C. A. M. Wadi-el-Harfr.
89. „ *UMBELLATA*, Post. Sp. nov. Wadi-el-Harfr.
90. *Prunus ursina*, Ky. Ma'arrâh to Yebrûd.
91. „ *monticola*, C. Koch Wadi-el-Harfr.
92. *Amygdalus communis*, L. Antilebanon. Ma'arrâh plateau.
93. *Rosa canina*, L. Yebrûd.

XVIII.—CRASSULACEÆ.

94. *Umbilicus Libanoticus*, Boiss. Jebel-'Ain-el-Wu'ûl.

XIX.—MESEMBRYANTHEMACEÆ.

95. *Aizoon Hispanicum*, L. Palmyra.

XX.—UMBELLIFERÆ.

96. *Ferula Blanchei*, Boiss. Desert.

XXI.—

97. *Valerianella truncata*, Rob. Qaryetein.
98. „ *Kotschyi*, Boiss. Desert.

XXII.—CONYSOSITÆ.

99. *Bellis perennis*, L. Ma'arrâh to Yebrûd.
100. *Chamæmelum grandiflorum*, Boiss et Haussk, Ma'arah to Yebrûd.
101. „ *auriculatum*, Boiss. El-Beiqa to el-Jebâh.
102. *Matricaria aurea*, L. Palmyra.
103. *Achillea* „ var. *discoidea*, Boiss. Damascus.
104. *Artemisia Herba-alba*, L. Desert and contiguous regions.
105. *Senecio coronopifolius*, Desr. Desert.
106. *Carduus pycnocephalus*, Jacq. Palmyra.
107. *Centaurea*, sp. Palmyra.

108. *Kœlpinia linearis*, Pall. Palmyra.
 109. *Lagoseris bifida*, Vis. Desert.
 110. *Taraxacum officinale*, L. Ma'arrâh to Yebrûd.
 111. *Zollikoferia*, sp. Desert.
 112. *Tragopogon buphtalmoides*, Boiss. var. *stenophyllum*, Boiss. Qarye-
 tein to 'Ain-el-Beida.
 113. *Scorzonera lanata*, M. B. Table lands. Desert.
 114. „ *papposa*, D. C. Desert.

XXIII.—PRIMULACEÆ.

115. *Androsace maxima*, L. Damascus plain

XXIV.—PLUMBAGINACEÆ.

116. *Statice spicata*, Willd. Palmyra.

XXV.—APOCYNACEÆ.

117. *Vinca Libanotica*, Zucc. Yebrûd.

XXVI.—BORAGINEÆ.

118. *Asperugo procumbens*, L. Palmyra.
 119. An undetermined species of Boraginea, genus uncertain Western
 half of desert.
 120. *Anchusa Milleri*, Willd? Desert. Palmyra.
 121. *Lithospermum tenuiflorum*, L. Palmyra.
 122. „ *arvense*, L. Palmyra.
 123. *Arnebia cornuta*, Ledeb. Palmyra. Desert.
 124. *Alkanna strigosa*, Boiss. Es-Saït to Abu-Dâli.

XXVII.—SOLANACEÆ.

125. *Lycium Barbarum*, L. Clumps in desert.
 126. *Hyoscyamus reticulatus*, L. Qaryetein.
 127. „ *muticus*, L. El-Beida to el-Jebâh.

XXVIII.—SCROPHULARIACEÆ.

128. *Verbascum Galilæum*, Boiss. Hems to Tripoli.
 129. „ *Damascenum*, Boiss? Palmyra.
 130. *Linaria Ascalonica*, Boiss., var. *BRACHYLOBA*, POST. Palmyra.
 131. „ *albifrons*, S. and S. Palmyra.

132. *Scrophularia zanthoglossa*, Boiss. Hems to Tel-Kelakh.
 133. „ *variegata*, M. B., var. *Libanotica*, Boiss. Damascus to Ma'arras.
 134. *Veronica Orientalis*, Mill. Es-Saït to Abu-Dâli.
 135. „ *triphyllos*, L. Palmyra. Nebk to Qaryetein.

XXIX.—OROBANCHACEÆ.

136. *Phelipea lutea*, Desf. Desert in salt marshes.

XXX.—LABIATÆ.

137. *Salvia acetabulosa*, Vahl. Es-Saït to Abu-Dâli.
 138. „ *verbascifolia*, M. B. En-Nebk to el Mahin.
 139. „ *controversa*, Ten. Qaryetein.
 140. „ *Verbenaca*, L., var. *vernalis*, Boiss. Qaryetein.
 141. *Nepeta cryptantha*, Boiss. et Haussk. Hems to Tel Kelakh.
 142. *Lallemantia Royleanu*, Wall. El-Bâridi to 'Ain-el-Beïda
 143. *Zizyphora tenuior*, L. Desert.
 144. *Stachys Arabica*, Horn. Hems to el-Hadîdah.

XXXI.—PLANTAGINEÆ.

145. *Plantago albicans*, L. Palmyra.

XXXII.—CHENOPODIACEÆ.

146. *Spinacia tetrandra*, Stev. Palmyra to 'Ain-el-Beïda.

XXXIII.—SALSOLACEÆ.

147. *Kochia* sp. Desert.
 148. *Atriplex Palæstinum*, Boiss. Palmyra.
 149. *Chenolea Arabica*, Boiss. Desert.

XXXIV.—MYROBALANACEÆ.

150. *Cynomorium coccineum*, L. Palmyra to 'Ain-el-Beïda.

XXXV.—EUPHORBIACEÆ.

151. *Euphorbia Apios*, L. Desert.

XXXVI.—ORCHIDACEÆ.

152. *Orchis incarnata*, L. Hems.

XXXVII.—IRIDACEÆ.

153. *Iris Germanica*, L. Hems to Tripoli.
 154. „ *Sari*, Baker. Desert.
 155. „ *Palæstina*, Baker var. CÆRULEA, POST. Desert.
 156. *Ixiolirion montanum*, Lab. Palmyra.

XXXVIII.—LILIACEÆ.

157. *Asphodelus microcarpa*, Viv. Es-Saiṭ to Abu-Dâli
 158. *Asphodeline lutea*, L. Hems.
 159. „ *brevicaulis*, Bert. El-Beïda to el-Jebâh.
 160. *Allium Rothii*, Zucc. Desert.
 161. „ *Oriente*, Boiss. El-Ghundhur to Es-Saiṭ
 162. MUSCARI ALBICAULE, POST, Sp. nov. El-Bârîdi to Ain-el-Beïda.
 163. „ *racemosum* L. Palmyra. Table lands
 164. „ *neglectum*, Guss. En-Nebk to El Mahîn
 165. *Bellevalia ciliata*, Cyr. Desert.
 166. „ *flexuosa*, Boiss. Antilebanon. Palmyra
 167. „ *densiflora*, Boiss var. LONGIPES, POST Hems.
 168. *Ornithogalum lanceolatum*, Lab. Yebrûd.
 169. „ *montanum*, Cyr. Jebel Qalamûn.
 170. „ „ var. *platyphyllum*, Boiss Deser
 171. „ *tenuifolium*, Guss. Desert.
 172. *Tulipa montana*, Lindl. var. AMBLYOPHYLLA POST. Jebe Ain-el-
 Wu'ûl.
 173. „ *biflora*, L. En-Nebk to Qaryetein.
 174. *Gagea reticulata*, Pall. Jebel Qalamûn.
 175. „ *foliosa*, Presl. Yebrûd. Palmyra.
 176. *Lloydia rubro-viridis*, Baker. Jebel Qalamûn.

XXXIX.—CYPERACEÆ.

177. *Carex stenophylla*, Vahl. Ma'arrâh to Zebrûd Desert

XL.—GRAMINEÆ.

178. *Sphænopus divaricatus*, Rehb. Desert.
 179. *Poa bulbosa*, L. Everywhere in the desert.
 180. „ *Sinaitica*, Boiss. En-Nebk to Qaryetein. Desert
 181. „ *Timoleontis*, Held. El-Beïda to el-Jebâh.
 182. *Vulpia pectinella*, D. C. Palmyra.
 183. *Festuca inops*, Del. Wadi el Bârîdi.
 184. *Sclerochloa dura*, Beauv. Qaryetein.
 185. *Scleropoa Menophitica*, Spr. Palmyra

186. *Nardurus tenuifloras*, Boiss. Palmyra.
 187. *Orientalis*, Boiss. Qaryetein to el Bâridi.
 188. *Bromus matritensis*, L. Palmyra.
 189. *Aegilops crassa*, Boiss. Palmyra.
 190. *Rhizocephalus Orientalis*, Boiss. Desert.

XLI.—NAIADACEÆ.

191. *Potamogeton crispus*, L. Canal ; Damascus.

XLII.—CHARACEÆ.

192. *Chara*, sp. Great fountain ; Palmyra.

XLIII.—LICHENES.

193. *Lecanora lentigera*, Web. Incrustation in salty ground.

COMPARISON OF THE ATMOSPHERIC PRESSURE IN
 PALESTINE AND IN ENGLAND IN THE TEN
 YEARS ENDING 1889.

By JAMES GLAISHER, F.R.S.

In the quarterly reports of the Palestine Exploration Fund, beginning July, 1888, and ending October, 1890, the results of observations taken at Sarona in the ten years ending 1889 have been published.

The observations at Sarona were taken a little north of the great orange groves of Jaffa, at a place one mile and a half from the sea shore, and about 50 feet above the sea level, in lat. 32° 4' N. and long. 34° 34' E., by Herr J. Dreher.

The observations at Blackheath were taken during the same ten years, at about 150 feet above the sea level, in lat. 51° 29' and long. 0° 1' E., by myself.

The observations at Sarona have been reduced to 32° Fah., and those at Blackheath have been corrected for the difference of elevation of 100 feet and reduced to 32° Fah.