

had come about one hour, to Aiyin, an uninhabited place, where there was a fine fountain and some very peculiar ruins. From there we went on south-west through Kerioth to Bozrah (or Bostra), and camped and spent several days, including Sunday, September 26th. Here the churches, theatre, columns, castle, old bevelled stones, streets, gates, triumphal arches, and reservoirs, not to speak of the inscriptions, are all wonderful, and I will undertake to describe them in due time. Here also we enlarged and enriched our collection of photographs.

Leaving our camp here we went sixteen miles to the south-west into the genuine desert, to visit the ruins of Um el Jemal, which some suppose to be the Beth Gamul of the Bible. Burckhardt, Buckingham, Porter, Wetzstein, and other distinguished travellers have looked out from the castle at Salchad, or from that at Bozrah,* on to this dark mass of ruins with longing eyes; but although two or more of these made the attempt, they did not succeed in reaching them. Mr. Cyril Graham and M. Waddington were the only Europeans who had visited the place previous to ourselves. The ruins of this unvalled town cannot here be described, but I may say that they are very instructive even to those who are tolerably familiar with Hauran and Syrian ruins as they exist in other places. Two or three photographs were taken here. We went next from Bozrah north-west in the direction of Der'at (Edrei or Adra'a) to Jisre esh Shirk, and camped; and then on to Der'at itself, and turned south and camped at Remtheh, an important place, on the pilgrim road from Damascus to Mecca. Through all this region we were obliged to guard our camp at night ourselves. We found we could not trust our men for this, because they would invariably go to sleep, with the most perfect indifference to danger imaginable. It was while on guard at Remtheh that one of our party, Mr. T., took a severe cold, which brought on a fever and nearly cost him his life. We found here only miserable water. The people had good water in their cisterns, but they would neither give it nor sell it to us; and had it not been for some Turkish soldiers there, who gave us some from the garrison supplies when they learned our need, we might have fared worse than we did. The next day we had a long, tedious journey to Gerash, where we arrived on the 1st of October. That day the thermometer was 87° in the shade at noon, and we were entirely without water, either for men or animals, until near night, when we were almost within sight of Gerash. We came then upon a spring of cool fresh water, which was worth more to us at that moment than a gold mine would have been. As for our animals, they were perfectly wild and unmanageable until they had quenched their thirst.

We spent three or four days at Gerash, and brought away over forty inscriptions and some beautiful photographs. In regard to the heat, I may add that at Gerash, as well as while on our way there, and also at Bozrah, and afterwards at Es Salt, we had many days when the thermometer showed 85°, 87°, and even 90° in the shade. Through Gerash, from one end of the city to the other, there flows a stream of cool, fresh, living water. Here is one of the finest "water-powers" in the East. From here our sick friend was taken to Es Salt, our next camping-place, and from there, as soon as he could be moved, to Jerusalem in a palanquin, *i. e.*, a great box fastened on to long poles, and carried between two mules, one before and one behind it. At Jerusalem he was placed in the Mediterranean Hotel, under the care of Dr. Chaplin. We took photographs of Es Salt, supposed to be the Ramoth Gilead of the Bible, and several at Amman, the Rabbath Ammon of the Bible, which was our next camping-place after leaving Es Salt. From there we went to Heshbon, and visited Nebo, the peak called

* I did not myself see the ruins of Um el Jemal from the castle at Bozrah, and make this statement on the testimony of others. But there are so many piles of ruins on the plain, that one might easily be mistaken and think he had seen Um el Jemal when he had not.

"Siagah," and supposed by some to be the Pisgah of Moses, Main, or the ancient Baal Meon, and several other places. We took photographs at Heshbon, and our photographer went several miles east of Heshbon, to a place called Musshatah (some distance east of Ziza, but not down on the ordinary maps), and photographed a very beautiful temple which still exists there. From Heshbon we went north to Arak el Emir, and photographed the ruins of the wonderful castle of Hyrcanus, and also the face of the cliff, in which the chambers, reservoirs, and stables which Josephus describes were excavated. These "stables," in which there are accommodations for one hundred horses in a single room dug out of the solid rock, appear something like a long livery stable, when one stands at the door and looks into it, except in this case there are no partitions for stalls; but the mangers are quite perfect, and so are the rings cut in the rock by the side of each manger, where the horses were tied. From here we crossed the Jordan at Jericho, and went by way of Jerusalem and Nablous to Beirut.

It has been impossible in this outline to give any special details of our work, yet we hope it will be found that our journey has been a very successful one. The whole country has been mapped out for future operations; the bearings taken, the observations, and the various records and notes kept by the engineers, are important; and the inscriptions copied, together with the measurements taken of ancient churches, temples, theatres, and other ruins, we hope will prove interesting and valuable. The geological, botanical, geographical, and archaeological features of this east-Jordan land are of the highest interest. The fertility of this region, which we commonly call a "desert," cannot be exaggerated. Its populousness and prosperity in ancient times will always remain one of the wonders of history; and an industrious and enterprising people, under a good government, could again make those broad fields, now so desolate, as productive as Egypt in her palmiest days.

SELAH MERRILL.

MR. STANLEY'S EXPEDITION.

Athenæum Club, Nov. 17, 1875.

MR. STANLEY'S missing letters (April 12 and 14, 1875) enable me to complete the statement which I made in the *Geographical Magazine*, for November 1, 1875.* Perhaps you will here allow me a word of personal explanation. What I have stated during the last fifteen years is simply that "Captain Speke's Victoria Nyanza is a lake region, not a lake." I never suggested that it was "a mere collection of lagoons." (Rawlinson's Address to Sixty-sixth Session.) My original idea of the Nyanza, derived from Arab information in 1859, was a long and comparatively narrow water, 240 by 80 miles, formed somewhat after the fashion of the Tanganyika. I proposed to call it the Ukerewe Lake, and, greatly to the displeasure of my late companion, I would not allow my map to contain any part of it except the southern extremity, which had been laid down by actual observation.

The Speke and Grant Expedition (1861-1863) set out with a map drawn for its leader by my friend, Mr. Trelawney Saunders. Capt. Speke, standing upon his observatory near Mwanza, took one angle of the shore-line to the north-east and the other to the north-west. It would not do to prolong these sights into infinite space, so at last the lines were connected by a third, forming a manner of triangle, with an inverted delta issuing from the base. For no better reason but to spread the lake over more ground, the Baringo or Bahari ya Ngo was dotted into the north-eastern extremity.

It is against this map, which disfigured the charts of Africa for so many years, whose true history is unknown to press and public, and which is evidently the only one familiar to Mr. Stanley, that I have so persistently protested.

The latest explorer, who calls this map an "im-

* The proofs were not corrected, and thus, at the ninth line from the end, "the aries" took the place of "the dries," and in the eighth line "affluent" supplanted "effluent."

aginary sketch" and still fancies that it was drawn "from native report," has reduced the Nyanza to reasonable limits. His easternmost point is E. long. 35°, Capt. Speke's being 37°—a little difference of 120 miles. He has, in fact, cut off a third, or, including the Baringo, nearly one-half of the circuit; and the 50,000 square geographical miles may be greatly reduced. The lake now assumes an irregularly rectangular form, excepting only that suspicious bay without a name to the north-east, in E. long. 34° 49'. The limits, roughly speaking, extend from a little north of the Line to a little south of S. lat. 2° (Kagehyi being in S. lat. 2° 30'); and they range between E. long. (G.) 32° and 34°. The Napoleon Channel remains; the Luajjeri becomes the Luaserri or "still-water" Creek and the Mwerango clean disappears. No "rush drains" flow northwards, and the Luta Nzige is not a "backwater." There remains only that suspicious "canal" lying to the west of the true outlet, and this mystery we shall hope presently to see explained. At any rate, we have at last done with the mythical "inverted delta," which postulated a "group of lakes" attached or detached.

Capt. George, R.N., has protracted Stanley upon Speke, and the result is highly interesting. We have not yet received the thirty-seven observations made by the former, but with his own statement concerning the superiority of a "sea horizon" upon an equatorial lake at noon, we must prefer Capt. Speke in all the cases where latitudes and longitudes differ. Indeed, I am pleased to note that, whereas there was before a difference of sixteen miles, this has been reduced, in the case of Mtesa's capital, Ulagala or Uragara, to four or five; and we may safely predict, when the calculations shall be worked out, that the latitudes will agree better than the longitudes. The altitude of 3,800 feet must also be accepted, the difference of the independent observations being only ninety feet.

Having brought, by this correction of his latitudes, Mr. Stanley's northern base of Lake Nyanza some twenty-five miles further south, we may remark how well his eastern line corresponds, in its meridional direction, with that drawn by Mr. Keith Johnston for the Rev. T. Wakefield's remarkable paper, 'Routes of Native Caravans,' &c., in the *Journal of the Royal Geographical Society*, Vol. xl., of 1870; and this leads us to consider the possibility of a group of lakes lying upon the eastern area of Capt. Speke's Victoria Nyanza. Dr. Livingstone heard of four waters, namely, the Okara, the Baringo, the Kavirondo (probably a confusion with the following), and the Naivasha. Mr. Wakefield, whose Ligeyo mountain is evidently Stanley's "Ugeyeya," also proposed four—the Baringo, Samburu, Naivasha, and Manyara. Of these I advocated two—the Baringo and the Ukara.

We can by no means accept Mr. Stanley's account of the Baringo, which is supposed to send off the Asua Fiumara, namely, that it is a "limited country, extending over about fifteen miles of latitude." But the following words throw considerable doubt upon the separate existence of the Ukara; "North of Shizu, in Ukerewe, lies the large island of Ukara, which gives its name, with some natives, to that part of the lake lying between it and Ukerewe. It is about eighteen miles long by twelve wide, and is inhabited by a people strong in charms and magic medicine." These words have the ring of truth.

And we must find a lake region lying to the east of Mr. Stanley's Victoria Nyanza, and occupying the eastern area of Capt. Speke's Nyanza, otherwise we must reform our theories upon the subject of volcanoes. Mr. Wakefield's Njemsi or Doeny Mburo,—"with volcanoes and hot springs," in fact an eruptive region, somewhat like the Puy de Dôme country in olden times,—is too far from the shore (240 miles) to be fed by sea-water, and imperatively demands lakes. Indeed, we have Mr. Stanley's own authority for their existence, when he says, "I believe that east of the Nyanza, or rather north-east of its coasts, there are other lakes, though they have no connexion whatever

with the Nyanza (*n. b.*, as laid down by himself), or extend south of the Equator."

So far, then, Mr. Stanley's explorations have the rare good fortune to please and satisfy both parties, those who believed that the Victoria Nyanza of Capt. Speke was a single large water, and those who held that it was one of a group of lakes.

In another matter Mr. Stanley has by no means been so happy. It is not a little curious to contrast the two personal narratives which have lately riveted the attention of the reading public. Commodore Goodenough, the fighting man, will not even fire upon the savages who foully murder his sailors. Mr. Stanley, the civilian, while acting as amateur missionary to the King of Uganda, "improves off" the negro whenever he can. It is hardly fair, without further information, to lay down as a fact that Mr. Stanley could have avoided all this bloodshed; but his own story strongly suggests the possibility. A man who has acted war-correspondent in Abyssinia and Ashanti may have certain *vellèités* for playing the soldier; and a Christian philanthropist will, of course, aspire to "hang slavers." But the first encounter with the Waturu, when the little army was unduly broken up into four divisions, might apparently have been avoided by leaving the country before the tribe had made ready to fight: the experienced traveller never fails to see premonitory symptoms of an outbreak, and Dr. Livingstone's Journals supply a dozen cases in point. The last letters again smell of blood. The "shower of huge rocks" (*Anglicè* stones) discharged at Uyuma might probably have been prevented by a display of fire-arms; for instance, by discharging a dozen shots at the trees and at the water surface—thus it would not have been found necessary to "lay dead the foremost of theimals" with the revolver. The same may be said of the "row" near Bugeyeya Island, where four negroes were killed off shore by the repeater, and a canoe was smashed with the elephant rifle. The report at Zanzibar is that much of the something done during the search after Dr. Livingstone. Evidently it is not only the "Arab slave dealers of Pangani" who have taught the natives to do anything but "love people carrying guns." This well-known intrepidity and determination will aid in making at least three regions of Central Africa "Hell's highway" to the white traveller of many generations to come, and this extreme destructiveness appears even more condemnable than Commodore Goodenough's excessive softness of heart.

RICHARD F. BURTON.

MR. C. B. VIGNOLES, F.R.S.

We briefly recorded in our last number the death of this eminent engineer, but a few facts referring more especially to his personal history will not be without interest.

The Vignoles came from Languedoc, and claim descent from the celebrated Italian architect, Bramante. The first of the family who turned constant was Jacques de Vignoles, Sieur de Lades, whose immediate descendants took refuge in Ireland on the Revocation of the Edict of Nantes. Two branches of this family are mentioned in the subsequent history of the Huguenot emigrants, of which one remained in Ireland, and the other settled at Southampton. Mr. Vignoles belonged to the latter; but his father—Capt. Vignoles, of the 43rd Regiment of Light Infantry—being stationed in Ireland in 1793, the subject of our notice was born at Woodstock, in the county Wexford, on the 31st of May in that year. Mr. Vignoles—being only an infant—seems to have been with his father when the 43rd was stationed in the West Indies, where Capt. Vignoles was killed in action. Through the influence of the Duke of Kent, an army in his father's regiment was given to the young man who was then but a few months old; and he had completed his second year the baby was brought back to England, and placed in the care of his maternal grandfather, Dr. Hutton. Mr. Vignoles undoubtedly owed to the personal supervision of so eminent an

instructor. He became a sound mathematician and an expert calculator, was well versed in all the technicalities of foreign and English measurements, and may be said to have been the first modern engineer who was a practised linguist. He had also an extensive acquaintance with standard English writers, and possessed a most retentive memory. When Sir G. B. Airy was a guest of Mr. and Mrs. Vignoles at Bilboa in Spain, at the time of the Astronomical Expedition in 1860, a most amusing competition took place between our eminent astronomer and his host. It could hardly be called a scientific contest, as it was, in fact, a trial of memory as to who could most readily remember and recite some of our best English ballads. Travelling backward from Canning's 'The Needy Knife-grinder,' which Sir George easily reproduced, Mr. Vignoles plunged at once into the less familiar ballads of the last century, in which, however, the astronomer was equally at home. The result was a "draw." They were

*Ambo florentes cœtatibus,
Et cantare pares et respondere parati.*

Owing to circumstances which have been noticed in several of our contemporaries, Mr. Vignoles became a railway engineer. He had proved his theoretical and practical acquirements by a survey of Florida, the map he compiled on the occasion being a monument of careful work and draughtsmanship. His energy soon brought him into notice, and his services were at once put in requisition by the elder Stephenson and the Messrs. Rennie. His chief original lines were the Midland Counties, the North Union, the Sheffield, Ashton and Manchester, and the little North-Western in England. Mr. Vignoles is also to be credited with the first Irish railway, from Dublin to Kingstown; and he also prepared the plans for the line from Waterford to Limerick, and projected other schemes which were afterwards carried out. It must not be forgotten that the first railway in Switzerland was constructed from his designs, and the same may be said of many other foreign lines. We need not follow out more minutely his purely technical work. In the complete grasp of all the details of a profession which was then only (so to speak) in process of formation, he must be pronounced equal to the best of his co-workers, and in some respects superior to all. He has been called by a competent judge the "purest" civil engineer of his day, and when his biography appears,—a pious labour soon, we believe, to be undertaken by members of his family,—these remarks will be found fully justified. Slowness of conception was in his eyes an unpardonable fault; but the mass of mankind does not like to be hurried, and that ready power of seeing a thing not merely as it is, but as it is to be, and more especially as it ought to be, put him occasionally at a disadvantage with his contemporaries, while, in reality, he only anticipated by some quarter of a century important works, deemed then impossible, which he afterwards lived to see carried out.

Mr. Vignoles was not the author of any important literary work, but his lectures on engineering, delivered while Professor at University College, form a text-book of proved utility, while his printed Reports and minor treatises, though known to the profession, may yet acquire a more extended usefulness. His versatility led him to cultivate many branches of science, especially astronomy. He co-operated with Sir G. B. Airy in organizing the "Himalaya" Expedition to Spain, already referred to, on which occasion he compiled a very ingenious map, showing the shadow-path of the sun at the time of the total eclipse in 1860. This was accompanied by a spirited sketch of the Basque provinces and the Cantabrian Pyrenees (now the seat of the Carlist war), through whose passes Mr. Vignoles was then carrying his railway, which reaches beyond the Ebro into the plain of Castile.

Mr. Vignoles retained his faculties, and even his personal activity, to the last. It was only a few days ago that he attended a meeting of scientific colleagues, when his unimpaired vitality and appearance of vigorous old age were remarked

upon by many. But his time was come; and a painless illness of only four days' duration was terminated by a peaceful death at the ripe age of nearly eighty-three years.

GEOGRAPHICAL NOTES.

COL. GLUKHOVSKI'S caravan, which left Krasnovodsk on the 13th of October, has been attacked by Teke Turkmans at the wells of Kum-kuduk, and its leader taken prisoner. Thus much for the peaceable disposition of these lawless tribes!

The forthcoming number of Petermann's *Mittheilungen* contains papers on Lieut. Wheeler's exploration of New Mexico and Colorado, on Nordenskiöld's expedition to the Yenisei, and on Stanley's circumnavigation of Lake Nyanza. The latter is accompanied by a map, based upon that published in the *New York Herald*, and, therefore, full of errors as regards its nomenclature. A more correct map will appear in the next number of the *Geographical Magazine*. Prof. Nordenskiöld is justly proud of the success achieved by the expedition of which he was leader, but we believe him to be over-sanguine when he speaks of a new commercial highroad through the Sea of Kara, which will connect Europe with the basins of the Ob and Yenisei.

Col. Prout writes from El Obeid on the 16th of October:—"Dr. Pfund has just returned from his exploration, after having travelled four hundred miles. He has examined North-Western Korodofan, and penetrated to the Jebel Serong, in Dar Fur. He has collected a large number of botanical specimens, and taken valuable notes on the nature of the country visited."

The Khedive appears to set about in real earnest to conquer a portion of Abyssinia and other African countries. Adoa has already been occupied by an army corps, sent thither from the east, and King Menelek of Shoa is said to co-operate in the destruction of Johannes, the King of Abyssinia. A second army corps is going up the Sobat, and a third corps has recently left Suez for the Danakil and Somali coasts. Harar is already occupied by Egyptian troops.

A mail from the Arctic Expedition, via Copenhagen, has reached this country, and although the dates are anticipated by the despatches brought by Capt. Allen Young in the Pandora from the Carey Islands, at the entrance of Smith Sound, the intelligence conveyed in these letters from Upernivik is not. Through the exertions of Mr. Smith, the Danish Inspector of North Greenland, Capt. Nares was enabled to obtain the number of dogs he required, viz. sixty, two-thirds of them being full-grown, powerful animals. The winter of 1874-5 had been a mild one at Upernivik, but the spring was backward; the season, however, had, on the whole, been very favourable. The whaling fleet had put back to Upernivik at their first attempt to cross Melville Bay, but, after a short delay, they again started, and must have succeeded in passing it. Capt. Nares had also succeeded in procuring the services of the Esquimaux Hans, the dog-driver that accompanied Hayes and also the Polar Expedition. It is intended to keep up the communication with all the depôts down to Lyttleton Island during the travelling season, to see if they are intact, and this duty will be performed by Hans and his dogs. Every preparation had been made for cutting docks in case of the ships being caught between the fast and the travelling ice in Melville Bay, but we now know, from the despatches brought by the Pandora, that the necessity did not occur, and that the Expedition had reached the entrance to Smith Sound in safety. There were no cases of sickness on board either ship, and all were in the best of spirits, and looked forward to attaining higher northern latitudes.

Through the courtesy of the editor of the *Bombay Gazette* we have been favoured, by the last mail from India, with an early copy of 'Maclagan's Guide to Bombay,' the publication of which has been hastened to meet the occasion of the Prince of Wales's visit to India. It is the first Guide to Bombay that has been published, and is at once