

ART. XXVII.—*Geographical Notices.* No. XVI.

THE notices of the progress of Physical Geography which were commenced in this Journal in 1858, having been for a few months interrupted, it appears necessary in resuming them to refer briefly to certain expeditions of which our readers through other channels may have been already informed, but the effort will be made to report the latest information which has reached us from trustworthy sources.

Those who are interested in the maintenance of these Notices are respectfully requested to communicate to the undersigned or to the Editors of this Journal, such information of an original and reliable character as may come to their knowledge. Written communications and printed documents bearing in any way upon the progress of geographical science, (especially such as are not accessible through the ordinary channels of the book trade) are especially requested. As there is an evident propriety in making an American Journal the repository of everything which pertains to the exploration of this continent, all such information whether published by congressional or legislative bodies, by societies or by private enterprise will be particularly welcome.

DANIEL C. GILMAN.

Yale College Library, New Haven, February, 1862.

AFRICA.

SPEKE'S JOURNEY TO LAKE NYANZA.—Those who have kept informed in respect to the progress of African discovery will remember that on the celebrated journey (often referred to in this Journal) in which Major Burton visited and explored one of the great lakes of eastern central Africa, known as the "Tanganyika," his associate, Capt. Speke, discovered at a considerable distance northeast and at a much higher altitude, a second immense lake called by the natives the Nyanza, to which the loyal Englishman prefixed the name of his sovereign, calling it the Victoria Nyanza. It is this second lake which was supposed to be the source of the Nile. In regard to it, however, nothing definite was known, as the explorer only saw the southern extremity and had only very meagre and indefinite information respecting its extent toward the north. The possibility and indeed the plausibility of the proposed solution of the vexed problem of the Nile induced the British Government to cooperate with the Royal Geographical Society, in sending Capt. Speke to Zanzibar, once more, thence to retrace his steps to the Nyanza, and traverse the lake if possible to its northern shores, where of course it could be determined whether a great river flowed from

it. He set out upon this second journey April 21st, 1860, having as an associate Capt. Grant. They left Zanzibar for the interior Sept. 25, 1860. Letters have been received from them, dated Khoko in Western Ugo, Dec. 12, 1860.

PETHERICK'S EXPEDITION TO GONDOKORO.—To cooperate with Capt. Speke, Mr. John Petherick, (author of "Egypt, the Soudan and Central Africa; being Sketches from sixteen years travel," London, 1861, 8vo,) for many years British Consul at Khartum, has been commissioned by the Government and Society already mentioned, to go up the Nile to Gondokoro, fourteen hundred miles above Khartum and nineteen hundred above Alexandria, where he will be able to establish a depot of provisions and apparatus for Capt. Speke, and if need be, engage with him in exploring any part of that region. Gondokoro, described as being in north latitude $4^{\circ} 30'$ and east longitude $31^{\circ} 50'$, is the seat of an ivory mart during the months of December and January, when traders from Khartum visit it and obtain their ivory in exchange for grain and beads. Here also Knoblecher established a Roman Catholic mission which was abandoned in 1859.

The appeal of the Royal Geographical Society for funds to the extent of £2000, in aid of this expedition gives the following additional statements:

"Immediately above Gondokoro, a succession of rapids prevent farther navigation; below Gondokoro the passage is perfectly open to boats, sailing at the times when the periodical winds are favorable. During ten months of the year Gondokoro is deserted; the scanty and barbarous population of the village is dispersed over its barren neighborhood, and an expedition such as that under Captain Speke and Grant must necessarily be—exhausted of means of barter, and wholly ignorant of the negro languages of Northern Africa—will be sure to tempt hostility, and to incur serious danger of absolute want of supplies. If Captain Speke be unable to reach Gondokoro in December or January, his position will be exceedingly precarious, while farther advance to the north would be impossible.

"The first of Mr. Petherick's proposed objects, is to form a sufficient depôt of grain at Gondokoro, under the charge of his own men, to insure to Captain Speke means of subsistence and security from violence whenever he should reach that place; the second is, to explore the district colored *orange*, in the accompanying sketch map. The third is, to effect a meeting with Captain Speke, and to assist him through the hostile tribes between the Lake and the Nile. Many of these negro tribes are known to Mr. Petherick, and it is precisely in the locality where the party under Captain Speke would be most helpless, that that of Mr. Petherick would, comparatively speaking, be most at home; and even if the union of the two parties did not actually take place, the aid which Mr. Petherick's presence in the country might, with reason, be expected to afford to Captain Speke, can hardly be overrated.

"These circumstances being taken into account, together with the fact of Mr. Petherick's services being now available, who, beyond any other Englishman, is peculiarly fitted for carrying out the expedition he proposes, the President and Council of the Royal Geographical Society consider that they would fall short of their duty if they left any legitimate means unemployed for securing those services to the advancement of Geography and the honor of this country. Her Majesty's Government having declined to send out this additional expedition, the President and Council make their appeal to the liberality of individual Fellows of the Society and to that of the Public.

"The sum required to be raised is £2000. Should this be quickly obtained, Mr. Petherick will undertake to reach Gondokoro in November, 1861. He will then explore until March, 1862, when the setting in of the rainy season prevents farther movements. Starting afresh in August, 1862, he proposes to continue his travels till February, 1863, and after that to return to Gondokoro, reaching his depôt in 1863 or early in 1864."

Although only £1000, or half of the sum called for, was raised, Mr. Petherick set out in April, 1861. Letters have been received from him dated Korosko, Aug. 9, 1861.

The following instrumental instructions for his guidance were issued by the Honorary Secretary of the Society, F. Galton, Esq. :

"The observations that it is absolutely requisite you should make, are—

1. You are earnestly recommended to use every opportunity of practising with your sextants *upon stars* while on the lower Nile, and able to check your results with known latitudes; also to practise observing eclipses and occultations under the same circumstances.

"2. As a general rule, observations should be made at marked points, such as the confluence of rivers, prominent hills, and native towns, rather than at mere encampment.

"3. Reliable latitudes of different places on the White Nile between Khartum and Gondokoro, and on your further line of travel. The latitude of Gondokoro is especially desired, and the meridian altitudes of at least six stars; three north and three south should there be observed.

"4. Longitudes by the exceedingly simple methods of the eclipses of Jupiter's satellites, or of occultations of stars, to be made at Gondokoro and at the furthest point of your travel, or at places adjacent to these. The local time should there be determined by more than one set of observations, to guard against error, and the method of altitudes on both sides of the meridian should always be used. Any longitude south of the parallel of the Bahr el Ghazal would be very valuable.

"5. The elevation above the sea of the following places by observation of the temperature of boiling water:—Cairo; Thebes; Assou; Junction of Atbara; Khartum; the capital of the Shilluk country; the river at a point opposite the Bahr el Ghazal; Gondokoro, and different stations on your further route.

"6. The three boiling-point thermometers to be occasionally compared, and to be carefully preserved, with the view of determining any changes in their index errors. They are also to be compared with those of Captain Speke, in the event of the hoped-for meeting taking place between you and that gentleman.

"7. Simultaneous observations of the rise and fall of the Nile, at Gondokoro and Khartum, should be instituted, and also at as many other places as trustworthy observers may be found to make them.

"8. It is of great geographical importance that the breadth, depth, and velocity of the Upper White Nile and its tributaries be ascertained, in order that their sections may be protracted, and the quantity of water that passes down them be determined. A few notes on practical methods of doing this will be prepared and given to you by Mr. George.

"9. The compass bearing of marked hills should be frequently taken, and the position whence they are observed defined and laid down as unmistakably as possible by cross bearing. Your course and estimated distances should be noted continuously day by day, and the variation of the compass frequently determined.

"10. Time observations with your chronometer should be taken whenever latitude observations are made. These will serve to connect distant points whose longitude has been reliably determined by the rare occurrence of satellite eclipses and occultations.

"11. If any architectural monuments are met with, it would be important to take sketches or photographs of them, however rude; to make a general plan by measurement (for which a measuring-tape should be taken); and to note any peculiarities of construction or style, such as the use of the arch, the angles of the walls, doorways, and windows. If there be any inscriptions or hieroglyphs, they should be copied, or impressions taken of them, if possible, with coarse paper damped in water and pressed with a brush, upon the inscription. Any small objects of art or antiquity found amongst the natives should, if possible, be collected.

"12. Every observation is to be copied from your rough notes into the Register-book which is supplied to you. Your entries, up to the last opportunity of communicating this winter with Khartum, to be forwarded from Gondokoro to the Secretary of the Royal Geographical Society.

LATEST INTELLIGENCE FROM DR. LIVINGSTONE.—From the Proceedings of the Royal Geographical Society, London, it appears that Bishop Mackenzie, of the United University Central African Mission, arrived off the mouth of the Zambesi in February, 1861, where he found Dr. Livingstone and his associates about to start on an exploration of the Rufuma river, in hopes of discovering by its waters a more convenient access to the Nyassa and Shire districts. The Bishop and one of his companions joined the expedition.

A letter from Dr. Livingstone to the late Professor Ritter, dated from the Rufuma, March 2, was presented to the Berlin Geographical Society at its August meeting.

Subsequent intelligence shows that the attempt of this bold traveller to ascend the Rufuma in his new steamer, the *Pioneer*, was not successful. After grounding several times he had been obliged to desist, and return to the Zambesi. The failure was attributed to the fact that the boat drew five feet of water, and did not arrive from England till the rainy season was far advanced.

LEJEAN'S EXPEDITION TO GONDOKORO.—Mr. G. Lejean, who is said to have been aided in his outfit by the Emperor of the French, set out early in 1860 from Chartum, and went south, hoping to find the source of the White Nile in the Lake Nyanza of Speke,—the same end in part which Mr. Petherick proposed to himself. Lejean reached Gondokoro, and was then prevented by illness from pushing his explorations farther. But the Journal of the Geographical Society of Paris gives us reason to expect good results from his investigations in Eastern Soudan and high Nubia.

ROSCHER AND VON DER DECKEN.—Karl v. d. Decken, a friend of the late Dr. Roscher, (murdered in his attempt to reach Lake Nyassa from the East African coast,) endeavored to prosecute the discoveries of Roscher, but was robbed and driven back. A recent letter to Sir Roderick Murchison says that v. d. Decken will now try to reach the peaks of Kilimandjaro.

THE POLAR REGIONS.

THE POLAR EXPEDITION OF DR. HAYES.—The return of Dr. I. I. Hayes who set sail from Boston, July 10, 1860, for the purpose of adding to our knowledge of the Arctic Regions and especially of ascertaining whether there is an Open Polar Sea, has already been mentioned in this Journal, (xxxii, 452). Immediately after his arrival in Boston he addressed a letter to Henry Grinnell, Esq., President of the American Geographical Society in New York, and on the 13th of November he made a public statement before the same society, under whose auspices in part he went forth, in respect to the results which his expedition accomplished. A few days later he addressed the Academy of Natural Sciences in Philadelphia upon the same subject. Full reports of these communications have been made in the newspapers of the day, but so far as we are aware Dr. Hayes has not yet printed any complete authentic account of his voyage. Indeed it is too soon to expect him to do so.*

In a letter addressed to Prof. B. Silliman, Jr., he speaks as follows in reference to one of these addresses: "You will understand that I do not undertake in it a discussion of results, for my materials are yet unreduced. I shall merely describe what I saw and what was done in behalf of the science of the Arctic regions. My materials are I believe of much value. Since the death of Mr. Sonntag I have labored almost alone and of course I have not done all that might have been accomplished by a *corps* of workers. The duties of my command occupied much of my time and I embraced every opportunity to collect photographic views. Of these I have nearly two hundred, many of them quite

* A phonographic report of the Philadelphia address (from the Phil. North American) will be found in Littell's Living Age, January 4, 1862.

good. My scientific friends will I trust therefore be lenient towards any imperfections or deficiencies in my results. The photographic views especially of the glaciers will not be without a certain scientific value.

The expedition has been for the most part fortunate and satisfactory."

Awaiting from Dr. Hayes a more elaborate statement of the voyage, we place upon record here for convenience of reference a few of the principal data.

The United States, Dr. I. I. Hayes, commander, set sail from Boston, July 10, 1860, and returned to that port, October 23, 1861. The first stopping place was Proven, in lat. 72° , then Upernavik, and then Tessuisak, in lat. $73^{\circ} 40'$ from which he set sail (going northward through Melville Bay) Aug. 22, 1860. After various repulses by the ice, the vessel entered Smith's Straits, Sept. 2. The ice was so extraordinarily thick that it prevented any access to the western coast of the straits, and Dr. Hayes contrary to his plan was driven into winter quarters on the east coast about ten miles north of Cape Alexander and about twenty miles south in latitude and ninety miles south by coast line of Dr. Kane's winter quarters in 1854-5. He named his harbor Port Foulke after a distinguished member of the Philadelphia Academy. The loss of Dr. Hayes's dog team, the death of his chief scientific reliance, Mr. Sonntag, the peculiar condition of the ice and other difficulties seriously interfered with the proposed sledge journey to the North,—but persevering, amidst great obstacles, Dr. Hayes succeeded in going as far north as $81^{\circ} 35'$ latitude which he attained on the 18th of May. He returned to his winter quarters in June. The remainder of the summer he spent in scientific researches and in making ready for his return voyage. He saw no reason to suppose that by spending a second winter in that high latitude he could with his reduced force accomplish enough to warrant the increased expenditure. The results of his voyage are thus briefly stated.

"1. A detailed survey of the west coast of North Baffin Bay, Smith Strait, Kennedy Channel, and the extension of the survey to the north of any previous explorations. This survey embraces about 1,300 miles of coast line.

"2. The discovery of a new channel opening westward from Smith Strait, parallel with Jones' and Lancaster Sounds.

"3. A detailed survey of the coasts of Whale Sound, and the coasts to the north and south of it. This survey embraces about six hundred miles of coast line.

"4. Surveys of glaciers by which their rate of movement is estimated.

"5. Complete sets of pendulum experiments.

"6. Sets of magnetic experiments at Port Foulke, Cape Isabella, in Whale Sound, at Upernavik and Godhavn.

"7. Topographic and hydrographic surveys, including tidal observations.

" 8. Large collections of specimens of natural history, and geological and mineralogical collections.

" 9. A continuous set of meteorological observations.

" 10. An extensive collection of photographic views.

" 11. The accomplishment of a more northern latitude than ever before attained upon land.

" 12. Fresh confirmation of theories respecting the open Polar Sea."

TORRELL'S POLAR EXPEDITION.—The Swedish Polar Expedition under Torrell which was fitted out with extraordinary completeness has failed in its chief objects. The ships lay for more than a month in the Treurenberg Bay, on the north coast of Spitzenberg, shut in by pack ice, and were afterwards much hindered by bad weather and other difficulties, while the sled expedition to the North Pole was wholly given up on account of the floating ice.—*Petermann's Journal*.

THE NORTH ATLANTIC TELEGRAPH EXPLORATIONS.—Since the possibility of a transatlantic telegraph was so successfully demonstrated by Mr. Field and his associates in their great experiment of 1858, various plans have been suggested for accomplishing the same results in a manner more likely to be of lasting service. The scheme upon which most attention has been bestowed proposes to run a line from the North of Scotland to the Færoe Islands a distance of about two hundred and twenty-five miles; thence to Iceland about three hundred miles, thence to South Greenland about six hundred miles and thence to the coast of Labrador also about six hundred miles. The greatest of these intervals in which the telegraph wire would necessarily be submerged is less than a third of the distance between the points on the coasts of Ireland and Newfoundland which were successfully united in the experiment above referred to.

In one of the meetings of the Royal Geographical Society last year, this new project was discussed, and a great deal of fresh matter pertaining to the physical geography of the regions specified, was brought forward. Five papers were read. The first by Capt. McClintock, R. N., gave an account of his soundings on the *Bulldog* in the summer of 1860. The second by Sir C. T. Bright gave a report of the soundings of the *Fox* under command of Capt. Young. The third paper was a report of an exploration of the Færoes and Iceland by Dr. John Rae. The fourth paper was by J. W. Tayler, Esq., on the Fiords of South Greenland, and the fifth was by Col. T. P. Shaffner on Electric Circuits. These papers are printed in the Proceedings of the Royal Geographical Society, Vol. v, No. ii.

From the paper of Sir Leopold M'Clintock we make the following extracts in relation to the soundings which were made under his direction.

AM. JOUR. SCI.—SECOND SERIES, VOL. XXXIII, No. 98.—MARCH, 1862.

"Leaving the Færøe Isles on the 6th of July, we sounded across towards Ingólfsbolde upon the southeast shore of Iceland, a distance of 280 miles, and found the depth to be generally less than 300 fathoms, the greatest depth being 680 fathoms. The specimens of the bottom consisted chiefly of fine sand, or mud and broken shells, and, in two instances, of minute volcanic debris; the temperature of the sea at 100 fathoms below the surface scarcely varied from 46°. The depth of water upon this section of the telegraph route is so moderate that it would be an easy matter to lay down a cable between Færøe and Iceland. Since my return I find that Beru Fiord, upon the east coast of Iceland, has been examined with a view to its selection as the landing-place for a cable; it is about 80 miles to the northeast of Ingólfsbolde, and has the advantage of being somewhat nearer to Færøe."

* * * * "Five days of very calm weather enabled us to complete the line of soundings between Faxa bay [on the southwest coast of Iceland] and the southeast coast of Greenland. The depths generally were very regular, the greatest being 1572 fathoms, and situated in mid-channel; but when within 40 miles of Greenland the depth decreased from 806 fathoms to 228 fathoms, in the short distance of $3\frac{1}{2}$ geographical miles.

"The nature of the bottom was chiefly oaze, that is, fine mud partly consisting of minute organic remains; but near to Iceland volcanic mud and sand were more frequently brought up. The temperature of the sea at 100 fathoms below the surface gradually diminished from 46° near Iceland, to 39° off the Greenland coast. Circumstances which it is unnecessary to allude to here prevented me from commencing before 18th August the line of soundings between the southwest coast of Greenland and Hamilton Inlet on the Labrador coast, a distance of 550 miles.

"The Greenland shore was still blockaded by such a vast accumulation of drift-ice that we could not approach within 45 miles of it, at which distance the depth was ascertained to be 1175 fathoms. This line of soundings to Hamilton Inlet shows that the greatest depth—which is in mid-channel—is 2032 fathoms; and that the decrease is very gradual until within about 80 miles of Labrador, where there is a change from about 900 fathoms to 150 fathoms in 7 or 8 miles.

"The ocean-bed consisted of oaze, but with fewer microscopic organisms than previously met with, whilst the average temperature of the sea at 100 fathoms below the surface was 40°.

"Seven days were all I could devote to the examination of Hamilton Inlet. Its length was found to be 120 miles, whilst its width varies from about 15 miles at its mouth to scarcely half a mile at "the Narrows," which are about half-way up to its head, and above which it expands into an inland sea of about 20 miles in width. All this great inlet was rapidly explored, its main channel from "the Narrows" to seaward was sounded, and the whole laid down by Mr. Reed, master and assistant-surveyor, with sufficient accuracy for ordinary purposes; but these soundings are not nearly sufficient to meet the requirements of a cable-route, nor even to decide whether a cable should be landed there.

"We found the depths to be very irregular, and seldom sufficient to secure a submerged cable from disturbance by icebergs. A perfect survey is absolutely necessary, and may show that the shallow water and

reefs of rocks, which to our imperfect knowledge appeared intricate and unfavorable, may not only be avoided, but may afford a sure protection against the intrusion of icebergs within the mouth of the inlet. There are some small rocky islets off the mouth of this inlet, and of these Hern Islets lie nearly in the middle and contract the widest channel of entrance to about 5 miles; the greatest depth obtained in this channel was 49 fathoms. Had the depth of water amounted to 70 fathoms in as far as this position, I would not hesitate in pronouncing favorably of Hamilton Inlet as a terminus to the cable from Greenland."

The following profiles, copied from the London Mechanics Magazine, give an outline of the soundings referred to in these remarks. An official report of this survey has not reached us. A map in the Journal of the Geographical Society gives some of the soundings, but not in such a form as to make it easy for us to transfer them to our pages.

PROFILES OF THE DEEP SEAS.

