

almost unknown before, and several lakes and rivers have been discovered and named by him.

Captain Marcy has explored the head waters of the Brazos and Big Wichita Rivers, in Texas, a region never before trodden by white men ; and a survey of the United States and Mexican boundary was also commenced by Major Emory.

Lieutenant Couch, of the United States' Army, has made a scientific journey into Mexico, at his own expense, leave of absence having been granted to him, at the instigation of the Smithsonian Institute. He went to Matamoras and Monterey, examining the adjacent sierras ; thence he proceeded to Parras, the plains of Mapimi, and the Caves of Durango. Among other motives for this journey, was the acquirement of a large collection of manuscripts, maps, and natural objects, made by Luis Berlandier, a Swiss, and a member of the Academy of Geneva, who had resided in Mexico, and devoted himself to Mexican research from 1826 to 1851, when he died. This collection was found very valuable, and purchased from the widow. A catalogue is appended to the Smithsonian Report.

Among various works which have appeared, and which throw light upon the geography and ethnography of America, I notice a 'Mémoire sur les Anciennes Populations Mexicaines,' by M. Ludewig ; a treatise on the Hydrography of the Ohio, by Charles Ellet ; a notice and map of the projected canal between the Pacific and Atlantic through Nicaragua, by M. Dupuy. Mr. J. H. Coffin has written upon the distribution of winds in the northern hemisphere ; and great light has been cast on the comparative philology of the American languages by the labours of the Rev. R. S. Riggs, and his acquirement of the Dakota language. Mr. Julius Froebel has furnished a work on the Physical Geography of North America ; and I notice an excursion to the ruins of Abo, Quarra, and Gran Quivira in New Mexico, by Major J. H. Carleton, U.S.A.

Central America.—In Central America, Mr. E. G. Squier, formerly Chargé d'Affaires of the United States to the republics of the Isthmus, has pursued his indefatigable researches so far, as to cause a survey to be made of the country lying between Puerto Caballos in the Bay of Honduras, and the Gulf of Fonseca on the Pacific. The results of this investigation have been stated in a Report, advocating the construction of the Honduras Interoceanic Railway ; and also in a volume by Mr. Squier, entitled 'Notes on Central America, particularly the States of Honduras and San Salvador, their Geography, Topography, Climate, Productions, Po-

pulation, &c. ;' with an original map and sections, which the author has presented to our library.

Our active associate Mr. Power, of Panama, has recently presented to the Society an important addition to the geography of Central America, in a tracing of an original manuscript map of the province of David, on the frontiers of New Granada and Costa Rica, made from a new survey by Colonel Codazzi. This survey has enabled an interesting portion of the Isthmus to be delineated which was previously a blank on our maps.

West Indies.—The Geography of Cuba has been published by Don Esteban Pichardo, under the auspices of the Royal Junta of Fomento.

Among the Papers of this Session, I notice the Landfall of Columbus, by Captain A. B. Becher, R.N. The first land in the New World that was seen by the great Genoese adventurer is a point of considerable historical interest. Hitherto, in this country, the subject has been treated in works of biography and history ; but it has now been taken up by a really practical hydrographer, and the records of the Spanish archives compared step by step with the configuration of accurate modern charts. In like manner, the spot where Julius Cæsar first planted his foot upon British ground was treated of by the most eminent geographers of their day—D'Anville, Halley, Rennell, and others ; but it has been left for the enlightened Astronomer Royal, from an investigation of certain phenomena which modern science had brought to our knowledge, to prove, with almost mathematical certainty, the precise spot in dispute ;* and thus, by assiduous research and comparison, has our Assistant Hydrographer arrived at conclusions by means of modern delineations with respect to the Landfall of Columbus, which seem to be worthy of equal attention.

South America.—The progress of geographical research in South America has been scarcely less active than in the northern and central parts of the great Western continent.

New Granada.—The course of the navigable river Atrato, which falls into the Gulf of Darien, has been subjected (along with its western affluents and the adjacent streams flowing to the Pacific) to the investigations of several surveying expeditions, despatched by Mr. F. M. Kelley, of New York, at his own expense. For more than fifty years, Baron Humboldt had continued to direct attention to the facilities, which the Atrato was reported to present, for establishing

* See 'Archæologia,' vol. xxxiv.

water-communication between the Atlantic and Pacific Oceans. Actuated by the writings of the veteran geographer, Mr. Kelley has caused the whole course of the Atrato, from its mouth to its headwaters, to be surveyed; and having discovered a route, by way of the Truando, which he deems to be favourable for a ship-canal, he has considered the subject to be of so much importance to the great maritime powers, as to invite an international investigation before any further steps are taken. The scrutiny of the project, which Mr. Kelley has invited from geographers and from civil engineers in this country, has, upon the whole, been favourable to his plan; and his proposal to make a more perfect examination of the locality, seems to be a project well deserving of encouragement.

Lieutenant Gilliss, of the United States' Navy, has presented to the Society two quarto volumes, published by order of Congress, comprising a portion of the results of "the Astronomical Expedition to the Southern Hemisphere" under his orders in the years 1849 to 1852.

Chile.—The first of these volumes, besides a summary of the scientific observations made by Lieutenant Gilliss and the officers under his command in Chile, contains a personal narrative of their journeys in that Republic, and many interesting particulars regarding its present political state. In describing its physical geography Lieutenant Gilliss has frankly acknowledged his obligations to the scientific individuals who, under the patronage of the Chilean Government, have been for some years engaged in investigating, surveying, and describing the geology, topography, and natural resources of the Republic, especially Messrs. Claude Gay, Professor Domeyko, and Messrs. Pissis and Allan Campbell, whose labours have been long known to us in Europe.

It was a source of great satisfaction to Lieutenant Gilliss, upon the completion of his own astronomical observations, to find that the Government of Chile was desirous to purchase the valuable instruments he had with him, as well as the observatory which he had set up. These were handed over to them; and thus Chile may boast of a national observatory, in addition to the various other scientific institutions, already founded by the liberality and enlightened policy of her rulers.

The second volume contains the results of a journey made by Lieutenant MacRae, the next officer of the expedition, across the Cumbre and Uspallata Passes of the Andes, and from Mendoza to Buenos Ayres, his instructions being to make a series of observations for elevation, latitude, and longitude, as well as magnetical and meteorological, for each 3000 feet of elevation on the slopes of the

Andes, and for each 100 miles of longitude on the line of road across the Pampas,—a task which he completed in 60 days.

The results, which are given in a tabular form, constitute an important collection of authentic data for geographers. It is satisfactory to observe how they corroborate the accuracy of the labours of the old Spanish officers, Bauza and Espinosa, whose map of the same line of country over the Pampas was published in the Hydrographic Office at Madrid in 1810. A copious appendix gives a particular account, drawn up by various learned individuals in the United States, of the Indian antiquities, and of the zoological, botanical, and mineralogical collections made by the officers in the course of their travels.

These volumes are beautifully embellished by well-executed plates, especially the natural history part; and the work reflects great credit not only upon the scientific attainments of the officers employed in carrying out the great astronomical and geodesical work entrusted to them, but also on the industry and ability with which they have brought together a large and varied mass of information regarding the countries they passed through; and the Government of the United States has done but justice to their labours in publishing the results of this important survey in the most liberal manner at the expense of the State.

Brazil.—The labours of our Honorary Member, Dr. Martius, in Brazil have come before us recently under a new form, in a volume presented to us by the author, containing fifty beautiful views illustrating the vegetation of Brazil.

Paraguay.—From Lieut. Page, commanding the U. S. Steamer 'Water Witch,' we learn, under date "Buenos Ayres, Dec. 26, 1855," that "the embarrassments arising from the jealous prohibition of the Government of Paraguay have, to such a degree, contracted the field of operations, as to deprive this expedition of the privilege of making contributions to geographical science and natural history to the extent that I had anticipated. I nevertheless hope that our labours will prove not to have been in vain in either of those fields, and that the result may give rise to commercial intercourse with countries fruitful in natural products and susceptible of extended and varied cultivation, but whose resources as yet lie dormant, waiting for the hand of energy and industry to awaken them to life. I allude particularly to those provinces most directly interested in the navigation of the river Salado, a river rising in the Cordillera, in the western part of the province of Salta, and discharging itself into the Paraná at the town of Santa Fé.

"By our exploration of this river we have shown that the Salado is navigable to within the province of Santiago, without presenting an obstacle, and that, with the expenditure of a little labour, it could, in the course of a few months, be made navigable to within the province of Salta, a distance of not less than 900 miles by land.

"The navigation of this river will open to the provinces Jujui, Salta, Tucuman, Catamarca, Santiago del Estero, parts of Cordova and Santa Fé, an easy way by which to transport their products and merchandise, which now, under the most disadvantageous circumstances, are conveyed in ox carts of the most unwieldy construction, involving an expenditure of time and money, and prohibiting the exportation of many valuable articles of commerce which could easily and profitably be transported by the river.

"The river was ascended in a small steamer from its mouth, the distance of 150 m. in a right line, and 350 by the river. This being in July (the season of low water), the steamer could not ascend higher. The river was then entered from its upper waters; its difficulties, its obstacles to immediate navigation throughout the above extent, carefully examined; its rise and fall considered; and the result showed no obstacle that may not easily be removed; and none of those obstacles, such as shoals and banks, which, when removed from one place, reproduce themselves in another.

"We have recently discovered also a new channel between the island Martin Garcia and the coast of the Banda Oriental, of 2 ft. more water than the old channel contains. The importance attached to this discovery is not confined to the greater depth of water in the new channel, but it assumes a political character. It deprives Martin Garcia of that important geographical position which is attached to it by the Government of Buenos Ayres, in whose hands it is at this time. Instead of Buenos Ayres possessing, as she now claims, exclusive jurisdiction over the old channel, leading into the rivers Paraná and Uruguay, on the ground that her territory is on both sides, over the new channel, she has only concurrent jurisdiction with the Banda Oriental. The new channel is more easily entered, and in it vessels are not obliged to pass nearer to Martin Garcia than $1\frac{1}{2}$ m.; thus taking from this island the perfect command it formerly had over the entrance to the rivers Paraná and Uruguay."

M. Francis de Castelnau continues the publication of his important journey in South America.

M. Delaporte has published an account of his journey in the country of the Araucanians.

Benjamin Vicuña Mackenna has reported upon the agriculture of Chile and upon European migration to that country.

M. Isambert and M. de Angelis, and Lieut. Maury, U.S.N., have written upon the free navigation of the Amazon.

AUSTRALIA.

By far the most important information we have had communicated to us with regard to this country is the progress which has been made by the North Australian Expedition under Mr. Augustus Gregory.

From this enterprising explorer, whose exploits in Western Australia are well known, by a letter communicated through the Colonial Office, we learn that the Expedition left Moreton Island on 13th September, 1855, in the ship 'Monarch' and the 'Tom Tough' schooner, and after nearly encountering shipwreck at the entrance of Port Patterson, was landed at Point Pearce.

At the time of the last despatch the stock had suffered from the voyage, and the horses were in a weak condition; but the Expedition was in all other respects in an efficient state, and the officers and men were all in good health and full of ardour. The horses having been landed from the ship, were to proceed round the head of the Fitzmaurice, making their way to the Kangaroo Point in Victoria River, whence the Expedition would take its final departure for the interior. No natives had been seen, but it was evident by many fires and other traces that they were numerous on that part of the coast. Through Sir Roderick Murchison some information has been received from Mr. Wilson, the geologist to the Expedition; and Mr. Baines, the artist, has illustrated the country about Moreton Bay by the sketches which have been laid on our table.

The importance of this Expedition in opening out to our knowledge the interior of the northern portion of Australia, in bringing us acquainted with the physical and geographical features of the country, by which we may hope to forward the progress of that most important and desirable object, the settlement of this portion of the continent; the determination of the watersheds of those important rivers, the Victoria and Albert, supposed to have their rise in an extensive range of mountains in the locality to be explored, and of the facilities or otherwise of connecting Carpentaria with

the southern ports, by which the dangerous navigation of the coast and of Torres Strait and the delays from monsoons will be avoided ; —the importance, I say, of all this information, which we may expect to derive from this Expedition, cannot be too highly estimated, whether as regards the welfare of the people, or the vast interests which are involved in this country, with respect to that portion of our colonies.

I cannot quit the subject of this Expedition without mentioning an instance of rare liberality in the cause of geographical science which was communicated at one of our evening meetings, during this session, by Count Strzelecki. When the North Australian Expedition was first planned, and when, owing to the length of time which had elapsed before it started, it was supposed that funds were wanting to carry it out, an associate of this Society, Mr. M. Uzielli, generously offered to place the munificent sum of 10,000*l.* at its disposal. Another of our Associates, Mr. W. S. Lindsay, M.P., had also previously offered to contribute largely towards the outfit of the Expedition. As, however, the Government have taken the matter into their own hands, these gentlemen have not been called upon to fulfil their promises ; but we must still look upon the offers as proofs, that the labours of the Geographical Society are fully appreciated by practical men, and of the zeal that exists among us for the advancement of geographical knowledge.

In connection with this part of my subject, I next mention a paper by our Associate Captain Stokes of the Royal Navy, on steam communication between our settlements in Australia and this country, India, and China, and on the establishment of a Penal Settlement in connection with a colony in the vicinity of the Gulf of Carpentaria. In this he proposes a new route through Torres Strait, and to render its various passages safe by the erection of lighthouses and the establishment of pilots.

The necessity for improving the navigation of Torres Strait was some months ago brought prominently forward by the great body of the shipping interests in Australia, in a memorial transmitted to this country, and communicated to Lloyd's ; and there can be no doubt that the vast interests involved, demand our serious attention ; for whether or not the proposed means of communication ultimately become the direct routes to and from those colonies, Torres Strait will still remain the high road of communication between India and the South Pacific Ocean, and between our Southern Australian colonies, India, and China.

New Caledonia.—From the ‘*Annales de la Marine et des Colonies*,’ we learn that the French have made a complete investigation of New Caledonia, and have taken possession of the whole island, and caused the sovereignty of France to be acknowledged.

The loss of a Chinese junk upon D’Entrecasteaux Reef, New Caledonia, has been the occasion of bringing us better acquainted with that most dangerous reef, and with its vast extent and correct geographical position, by Lieutenant Chimmo, R.N., and with its formation and natural history by Dr. McDonald, the assistant-surgeon of H.M.S. ‘*Torch*,’ under Lieutenant Chimmo’s command.

Norfolk Island.—You will have learned from our ‘*Proceedings*’ that Norfolk Island, in a complete state of preparation, and with all its buildings, has been appropriated to the use of the Pitcairn Islanders, who have all consented to be transferred there. The planting a colony consisting of persons of such exemplary moral conduct, and of such uniform piety, may perhaps exercise a beneficial effect upon the other islands of the Pacific within their influence.

Bonin Isles.—The Bonin Islands have obtained some notoriety lately, from the mention which has been made of them by Commodore Perry of the United States’ Navy, who considers them to be of great importance from their geographical position, and that they may be looked upon as offering to a maritime nation a most “valuable acquisition.” In an early stage of the question this officer claimed them as the property of the United States, under the impression that the group had been visited by an American citizen before the islands were formally taken possession of by myself in 1827. But having since learned from the Address of our late President, the Earl of Ellesmere, that the individual in right of whom he claimed them, was an Englishman, he has generously acknowledged that he was probably misinformed. And here I would leave the matter, except that I think it due to myself to reply to his remark, “that in naming these islands I had very unjustly overlooked the name of Coffin, who had visited the southern part of the group before I had.” To this I have only to plead entire ignorance of Captain Coffin ever having visited these islands at all, until I read the remarks of Commodore Perry. The right of possession from priority of discovery is a question of which nations are naturally jealous; but I trust that not only in respect of these islands, but in all other cases, our relations will be such, that our ports will be mutually open for the general benefit of navigation and commerce.

NEW PUBLICATIONS.

Numerous donations have been presented to the Society, including 4 atlases, upwards of 350 maps and charts, and 663 volumes and pamphlets; affording an excellent proof of the desire to bring its members acquainted with the publications of the day, and denoting a sense of the Society's usefulness. A complete list of these will be printed as usual in the Journal, and many have been specially alluded to in the course of the Address. Among the donations contributed by our own countrymen, though not at present associated with us, may be mentioned the learned work on the Chinese and their Rebellions, by Mr. Meadows, which will receive further notice in the 'Proceedings.'

Our associate, Mr. Alexander Keith Johnston, has completed the new edition of his superb Physical Atlas. The publication of the first edition of this great work, ten years since, had the effect of introducing in this country almost a new era in the popular study of geography, through its attractive and instructive illustration of the prominent features of the science. This second edition is to some extent an entirely new work, owing to the additions and improvements which have been introduced. I have only to refer to the names of Murchison, Forbes, Brewster, Ami Boué, and Berg-haus, to stamp the high character of the work; but I must not omit to mention, among new contributions, the Geological Map of Europe, by Sir Roderick Murchison and Professor Nicol; that of America, by Professor Rogers; General Sabine's Map of Terrestrial Magnetism; the Distribution of Marine Animals, by the lamented Professor Edward Forbes; and the addition of a large general Index adds materially to the utility of this extensive compendium of Natural Geography.

The Imperial Atlas of Modern Geography, edited by our associate, Dr. Blackie, of Glasgow, has reached its twelfth number. The maps are very neatly and correctly executed by some of our best cartographers.

The Royal Illustrated Atlas, with an introductory notice on the existing literature of geography, by Dr. Shaw, is also in course of publication by Messrs. Fullarton, and has reached its eighth part. The design of this atlas goes beyond the ordinary scope of unadorned cartography, in combining with the maps, picturesque vignettes and illustrations of the countries and their inhabitants. The maps are prettily drawn according to the latest

authorities, and the pictures, which form an unusual, though instructive feature of the work, are neatly engraved.

I may include in this notice of our own labours, a beautiful Map of Madeira, published in London, in the English language, and dedicated, by permission, to this Society, by our Corresponding member M. Ziegler of Winterthur. The physical features of this island, including the distribution of its vegetation, are skilfully portrayed; and in addition to his own observations, Mr. Ziegler acknowledges the assistance he has derived from the labours of Captain Vidal, R.N., and Sir Charles Lyell; and especially from the communications of Mr. Hartung, whose portfolios are rich with the researches of six winters. Such a map cannot fail to prove valuable to the geographer, and an interesting companion to those who seek in Madeira, for a milder climate than our own.

The successful researches which have been prosecuted among the mounds of Mesopotamia have led to the production of a series of three beautiful Maps for the Government of India, by Commander Jones, I.N., delineating the remains of Khorsabad, Nineveh, Selamiyeh, and Nimrud.

One of the latest communications received from our lamented Corresponding member, Vicomte de Santarem, contained the donation of a copy of the fac-simile published by the Vicomte of the large Map of the World drawn by Fra Mauro in 1459. This fac-simile is of the same size as the original, and published on six sheets.

Among our members who have contributed to Crimean geography may be now mentioned Mr. G. Cavendish Taylor, who has recently published a Journal of Adventures with the British Army, in two volumes.

One of our earliest members, General Monteith, whose Map of Georgia and the Caucasus was engraved several years since by the Society, and still remains in repute, has lately published a volume on Kars and Erzeroum, with an account of the Campaigns of Prince Paskiewitch and of the Russian Conquests beyond the Caucasus.

Mr. William Ferguson, our associate, has published his journal of a visit, entitled 'America by River and Rail, or Notes by the Way on the New World and its People.'

Dr. J. D. Hooker and our associate Dr. Thompson have published, separately, their Introductory Essay to the Flora Indica, including outlines of the Physical Geography and Botany of the Provinces of India.

A fine Map has been published lately by Mr. Stanford, con-

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taining the eastern frontier of the Cape of Good Hope, drawn by Mr. Henry Hall, of the Ordnance department in that colony, whose merits as a cartographer are well known. This map appears very opportunely, as it includes the country of the Bassutos, where disturbances are apprehended. Mr. Stanford has also presented a copy of the new edition of Baily's Map of Central America, with corrections from the recent surveys of Squier, Codazzi, and others.

Capt. Burton has completed the narrative of his dangerous journey to Mecca and Medina, in the disguise of an Affghan pilgrim; and he has also published an account of his visit to the African city of Harar, which had been deemed inaccessible, owing to the savage and hostile character of the chief, as well as of the people.

Our associate, Captain Charles F. A. Shadwell, R.N., C.B., has added to his useful publications on navigation a case containing, on a dozen cards, 'Formulæ of Navigation and Nautical Astronomy;' also another work on the Management of Chronometers.

The labours of other Members have been alluded to in various parts of this Address in connection with the different countries to which they relate.

PHYSICAL GEOGRAPHY.

During the past year there has appeared, under the direction of the zealous superintendent of the Ordnance Survey, an abstract of the operations, carried on in Ireland, for the purpose of referring the mean water levels upon various parts of the coast to a common standard. Although these observations have long been discussed by our Astronomer Royal, and will be found in the Transactions of the Royal Society, yet it is only now that the complete details of the operations have been published; and as the observations present this curious result, viz. that the mean sea level is higher upon the northern part of Ireland than upon the southern part, and as no notice of this has ever appeared in our Journal that I am aware of, I take this occasion of observing that, if we take as the standard Courtown, in Wicklow—a spot remarkable as having no perceptible rise or fall of its tide, and about midway on the axis of the great tidal wave between the extremities of Ireland—we shall find that the mean sea level stands higher on the north of Ireland (Ballycastle) by 0·881 feet and lower on the south (Castle Townsend) by 0·938 feet than it does at Courtown. I know it will be interesting to many of our Associates to have these facts inserted in their Journal.

Of late, various papers have appeared on the circulation of the waters of the ocean ; and as new facts are received, the interest of the subject increases. The labours of America have in this respect been very fruitful ; Lieutenant Maury, our able and newly elected Corresponding member, has laboured deeply in this field, and has shown us with what accuracy he has determined the course and velocity of the Gulf Stream, by the remarkable agreement between the real and calculated position in which the unfortunate ' San Francisco ' was found, after being disabled and drifting many days in the strength of the current.

The American Surveying Expedition, under Lieutenant Lee, has also contributed to the subject ; and, while pursuing its observations upon the streams of the ocean, has largely added to our store of ocean temperatures at various depths, and has furnished us with a most interesting section of the basin of the Atlantic, which will throw considerable light upon the practicability of the project of connecting the two great continents of Europe and America by a telegraphic wire.

Mr. Findlay, our Associate, has added to his former contributions on the subject of ocean streams ; and Captain Irminger, of the Danish Royal Navy, has supplied us with information as to a new course of the stream on the coast of Greenland.

It has been the practice of my predecessors to notice the progress of magnetic science from the natural connection between the compass and topographical operations. During the past year a committee has been formed at Liverpool for the purpose of inquiring into that subtle subject, the disturbance of the compass in iron vessels. They have made a report of their labours, up to the end of the year, to the Board of Trade, which presents some curious and interesting results, and they are still continuing their investigations. The Board of Trade encourages this inquiry, so manifestly advantageous to the shipping interest, by an annual grant of money.

The question of local attraction in ships has also engaged the attention of our learned and indefatigable Astronomer-Royal, who has recently furnished a valuable paper on the subject to the Royal Society.

Various papers on this subject by other authors also have been published since the last anniversary, of which some have been read before the British Association at Glasgow, particularly those by Dr. Scoresby, and by Mr. Towson.

It will be interesting to know that Mr. Piazzzi Smyth, the Astro-

nomer-Royal at Edinburgh, is about to proceed to Teneriffe, to make astronomical observations on the summit of the famed Peak of Teyde.

The distinguished author of the 'Law of Storms,' Sir William Reid, has published a notice of the motion of winds and storms in the Mediterranean, and drawn a comparison between the gales and forces of the winds of Malta and of Bermuda. The work embodies a memorandum by our valued associate, Captain Graves, R.N., on the advantages which shipping will derive from pursuing a certain course in the Mediterranean, with respect to prevailing winds at certain seasons of the year.

I am happy to be able to announce the completion of an important series of observations upon the tidal streams of the seas around our own shores, which have been carried on for several years in a small vessel, which the Admiralty liberally placed at my disposal. These observations are of great importance as regards this particular branch of science, as they satisfactorily establish, in tidal waves of a peculiar character, the existence of a simultaneous turn of stream throughout the wave, notwithstanding the remarkable fact of there being a progressively increasing tidal establishment. This theory was advocated in two papers under my own hand, printed in the 'Transactions' of the Royal Society; and it has now been further confirmed by numerous observations. The result will facilitate and simplify the navigation of our channels, and will affect much that has been written upon the subject of tides.

In connection with this branch of physics, I mention a work by Mr. F. A. Keller, an able hydrographical engineer of the French navy, entitled, 'Exposé du Régime des Courants dans la Manche et la Mer Allemagne.' The author has endeavoured to arrange the results derived from the first series of the observations, published, as before mentioned, in the Philosophical Transactions, in a manner which, he is of opinion, will render them more generally useful to mariners.

Lieutenant Maury has furnished a pamphlet on 'Lanes for Steamers,' or upon the routes which he would have steamers follow, when passing between England and America, in order to render this much frequented route more safe, by diminishing the chance of collision. In addition to lessening the danger of these passages, Lieutenant Maury points out several other advantages which would attend the adoption of his plan, and gives much useful information on the course of the Gulf Stream, as well as on districts where fogs and gales are most frequent, and the times when they most prevail.

CONCLUSION.

I have now laid before you as much of the general outline of the state and progress of Geographical science during the past year, as may be conveniently comprised within the limits of an Address, and I feel satisfied that there is much upon which the Society may be congratulated. The numerous communications made to the Society during the Session from all parts of the globe—the animated and enlightened discussions upon them, which are recorded in our useful periodical, the ‘Proceedings,’ which has been so successfully started, and the enlarged dimensions which our Journal has attained under the careful editorship of our zealous Secretary, Dr. Norton Shaw—are proofs of the many and fruitful sources whence information flows to us; and when we recollect how few of our evening meetings have been passed within these walls without some positive addition to the science we cultivate, we shall be able to comprehend the progress that is continually being made in Geographical research, and the great increase of the general interest which it excites. But it is not in the pages of our records alone, that the full benefits of the Society are seen—the mere facts added, year by year, to our store of knowledge, are but the promise of the successes before us, and of benefits to be derived from our labours. It is impossible to read the list of names enrolled as members of this Society without feeling convinced that its labours are considered valuable to every interest and to men of all professions; for it is not the geographer alone who will be found thus supporting our efforts: side by side with him stand the politician and the merchant, who regard with deep interest new enterprises opened out for commerce; and next to him the divine, who foresees in the extension of our science, fresh means of spreading the blessings of Christianity, and its attendant, the civilization of man. And so I might pass on to other professions, all concurring in the same sentiments and interests. In this union of views we cannot but foresee the enlarged success of the Society; and feel that it is with no exaggerated hopes we may look forward to its steady and satisfactory progress, and to its increasing importance and usefulness.

PROCEEDINGS
OF
THE ROYAL GEOGRAPHICAL SOCIETY
OF LONDON.

SESSION 1856-7.

First Meeting, Nov. 10, 1856.

REAR-ADMIRAL F. W. BEECHEY, PRESIDENT, in the Chair.

ELECTIONS.—*Capt. Cole; Colonel the Hon. A. H. Gordon, C.B.; Sir Charles Nicholson; Commander Montagu F. O'Reilly, R.N.; and W. P. Andrew; J. Entwistle; G. K. Fairholme; J. B. Heath; W. H. Hovell; A. Hodgson; and William Staniland, Esqrs., were elected Fellows.*

DONATIONS.—Among the more important donations presented to the Society, since the last meeting, were the Ordnance Maps of England and Wales, so far as published, on the scale of one inch to a mile; also the Ordnance Maps of Lancashire, Edinburghshire, Haddingtonshire, Kirkcudbrightshire, Lewis Island in Ross-shire, and Wigtonshire, all on the six-inch scale; Admiralty Charts; Robinson's 'Biblical Researches;' Commodore Perry's 'Narrative of an Expedition to the China Seas and Japan,' etc.; Fullarton's 'Gazetteer of the World;' Quartermaster-General's Map of the S.W. Crimea; Crawford's 'Dictionary of the Indian Islands;' Light-house Map of the British Isles by the Board of Trade; Burton's 'Harar;' Sir R. McClure's 'Discovery of the North-West Passage' by Sherard Osborn; Becher's 'Landfall of Columbus;' Fleming's 'Southern Africa;' Charts of the French 'Dépôt de la Marine;' Hughes's 'Geography;' Maps of Ireland and of Scotland, from Mr. Stanford; Transactions of various Societies, etc.

ANNOUNCEMENTS.—The PRESIDENT announced to the Meeting that since they last separated, the Expedition to Eastern Africa had been despatched under the command of Captain Richard F. Burton, who, he hoped, would be joined at Bombay by an officer of the Indian Navy, and at Zanzibar by the Church Missionary, Mr. Rebmann. From the enterprising character and experience of these individuals, the most favourable results might be expected.

Despatches had also been received from Dr. Livingston, announcing his arrival at Tete, and subsequently at the Mauritius,

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after the successful and unprecedented journey across the continent of Africa, from west to east. The President paid a high compliment to this enterprising traveller, and as he was shortly expected in England, he had postponed the reading of his papers until the Society should have the advantage of his presence.

The PRESIDENT next adverted to the offer which had been made by Dr. Baikie, F.R.G.S., to ascend the Niger, and as there was reason to expect this enterprise would shortly be undertaken, he would ask Sir Roderick Murchison to say how it stood at present.

Sir RODERICK MURCHISON said that it would be very gratifying to the Geographical Society to learn that Lord Clarendon had, from the first, expressed his desire to promote the expedition in every way; and he hoped it might soon be authoritatively announced to the Society, that the expedition would have the support of her Majesty's Government, and be conducted by the same officer who had led the former expedition up the Chadda.

The PRESIDENT then addressed the Society upon the subject of a letter, which the Secretary had received from that distinguished Arctic traveller, Dr. E. K. Kane, who had expressed deep regret at being prevented by illness from being present at the Meeting. The President had deferred answering this letter in the ordinary routine, as it afforded an opportunity which he was sure the Meeting would wish to avail themselves of—that of communicating to Dr. Kane, their sentiments on the occasion.

Sir RODERICK MURCHISON said, that with the permission of the President he would make a motion to that effect. It had always been their custom to welcome travellers of distinction to this country, but he was sure that on no occasion whatever, had any traveller from another land come to England, who had done so much to advance an object that was dear to Britain; who had gone so far to rescue the lives of persons in a great expedition, in which they, as geographers, had a great interest. There was no person who had ever come to this country, who ought to be received with a warmer welcome than Dr. Kane. His energies had been directed towards the attainment of an object in a manner which had called forth the approbation of every man of science, who had attended to the progress of his search, and read the remarkable book he had recently published. Dr. Kane had gone farther to the north than any Arctic explorer except Parry; and when he said that this remarkable man came with the intention of assisting Lady Franklin, in the endeavour to carry out by his own enterprise, the object that was at the heart of that noble-minded woman, and that he was prevented from doing so, by illness alone—when he

said this, he was sure Dr. Kane was entitled to the additional sympathy of all the geographers there present. Therefore he was proud to be the person who should make the motion ; and without occupying more of their time he would read the Resolution :—

“ That, on the occasion of the arrival in this country of the eminent Arctic explorer, Dr. E. K. Kane, of the United States,—who, for his arduous and zealous endeavours, under the auspices of Messrs. Grinnell and Peabody, to rescue Franklin, and the important additions he had made to geographical knowledge, had received the Gold Medal of the Society :—the President do communicate on the part of the Fellows, the expression of their sincere regret, upon learning that this distinguished man should have been prevented by ill health, from appearing at this meeting, to receive the unanimous and hearty welcome which awaited him.”

Captain SHERARD OSBORN, R.N., C.B., begged to second the motion. He ventured to do so, as one conversant with Arctic matters, and having examined Dr. Kane's reports, he was sure that never did Arctic traveller go through more extraordinary trials, or meet them with more courage and energy.

The PRESIDENT heartily concurred in the motion. He hardly knew whether to admire more in Dr. Kane, his great enterprise and perseverance, or his extraordinary modesty and generosity ; but that he possessed these qualities, and everything that would fit him for a traveller, there could be no question. He deeply regretted that indisposition prevented Dr. Kane from following up the course which he had so successfully begun.

The resolution, having been put to the Meeting, was unanimously passed, amidst an expression of general sympathy.

The following papers were then read :—

1. *Report of the Progress of the North Australian Expedition.* By Mr. A. C. GREGORY.

Communicated by the Right Hon. H. LABOUCHERE, Colonial Office.

Victoria River, 14th June, 1856.

SIR,—Circumstances having arisen which render it necessary that the vessel, attached to the North Australian Expedition, should proceed to Timor for supplies, I avail myself of the opportunity to transmit a brief account of the operations of the Expedition to the present time, and its prospective movements.

In my letter of the 23rd September, 1855, I detailed the pro-

ceedings of the Expedition to that date, the 'Monarch' sailing the next morning.*

Having organized a party to proceed by land with the horses to the upper part of the Victoria, consisting of myself, Mr. H. Gregory, Dr. Müller, Overseer Phibbs, and six men, the remainder of the party embarked in the 'Tom Tough' schooner, to which the sheep had been removed from the 'Monarch,' Mr. Wilson being instructed to ascend the Victoria and form a camp at some suitable spot for disembarking the sheep, if practicable, near Kangaroo Point; and in accordance, the schooner sailed from Point Pearce on the 25th September.

On the 28th, I started from the camp at Providence Hill with the horses, which had been reduced to forty-one, and many of these scarcely able to travel, pursuing an easterly course through level forest country of indifferent quality, till the 3rd October, when we ascended MacAdam Range, which proved to be only the deeply serrated edge of the vast sandstone table-land, which occupies so much of this N.W. coast of Australia.

On the 4th October, one of the horses was seized with sudden illness, and died in four hours; and on the 10th, a second horse was lost under similar circumstances.

On the 11th, the party reached the Fitzmaurice River and camped on a small dry creek; but the tide rising in the night, the alligators ascended the creek from the river and attacked the horses which were feeding on the land, severely wounding three. On the same day a horse had been abandoned, being too weak to travel.

Crossing the Fitzmaurice on the 13th, at the lowest point at which it was fordable—the water being fresh, 20 yards wide and 2 feet deep, with a rapid current—we steered southward, and traversed some fine grassy valleys during this day; but soon reaching the stony hills beyond, we were compelled to leave two more horses, as they were completely exhausted, having been for some days so weak that they could not rise without assistance.

The country now became more rocky, so that we did not reach the banks of the Victoria till the 18th, when after a difficult descent from Sea Range, we camped, one mile north of the "Dome."

The two following days were occupied in travelling up the Victoria, the distance being greatly increased by having to head a deep salt-water creek, which joined the river opposite Kangaroo Point. On the 20th we reached the camp, which had been established by the party from the schooner, on the left bank of the river, in lat. 15° 34' S.

* See Proceedings, No. I., p. 5; No. II., p. 32, 33, 49; No. IV., p. 79.—Ed.

Here I learned that the schooner had got aground about eight miles below Curiosity Hill, on the 27th September, and had not yet been got afloat, though the tide had driven her over several banks; that she had sustained much injury, and leaked so much that a large quantity of the stores was damaged.

The following day I proceeded down the river in one of the boats, and reached the 'Tom Tough' on the 22nd.

The schooner had not moved for some days, and the leaks were in some degree lessened by nailing battens and tarred blankets over the seams, which had opened. Being bedded 4 feet in the sand, I could not examine her bottom, though the bank was dry at three-quarter ebb.

Several of the deck-beams were fractured, and there were many indications of her being much strained, by the tide having worked deep holes at the bow and stern, and then leaving her dry on a narrow bank amidships.

The tides were too low to float her till the 24th, after which every succeeding tide carried the vessel a short distance higher up the river, and on the 27th she cleared the banks and reached Sandy Island. On the 29th, she moored at the camp, where there was a convenient spot for discharging the cargo and repairing the vessel.

On examining the schooner, the keelson was found to be broken near the mainmast, three of the deck beams broken, and nearly all the knees which secure the deck much strained from their places. The butts of several of the planks were started, and much of the copper torn off.

There having been on several occasions, 3 feet of water in the vessel's hold, much of the cargo was damaged; more than half the bread, sugar, and other dry provisions belonging to the vessel being wholly destroyed. The stores belonging to the Expedition, from being more carefully packed, did not suffer so much; about half a ton of flour, the same quantity of rice, 3 cwt. of salt, and 8 cwt. of sugar being destroyed, besides which, many packages of stores were damaged by the water leaking through the deck.

The greatest loss, however, which the Expedition has sustained, is the large number of sheep which have perished, owing to the long destitution on board the schooner. Out of 161 sheep embarked at Point Pearce, only 44 reached the camp with sufficient vitality to recover.

The early part of November was devoted to erecting a store, and discharging cargo from the vessel, preparatory to repairing her.

This being the driest season of the year, the horses had not improved sufficiently in condition to fit them for work. On the 15th

I therefore attempted to ascend the river in the gutta-percha boat, but soon after passing "Palm Island" the dry banks became so extensive that I relinquished the attempt, and returned to the camp, the heat of the sun having so completely destroyed the water-proofed canvas, of which the boat was constructed, that it was scarcely kept afloat during the latter part of the return voyage.

A few showers of rain having somewhat refreshed the grass, the horses showed some improvement. I therefore selected seven of the strongest, and on the 24th proceeded up the Victoria with a party consisting of Mr. H. Gregory, Mr. Wilson, and Dr. Müller.

Leaving the river a short distance below "Steep Head" we made a detour to the southward, and traversing a fine grassy country which extended to Beagle Valley, struck the river a few miles above the highest point examined by Captain Stokes.

Following the river upwards, we passed to the east of FitzRoy Range, and entered a deep gorge or ravine, bounded by cliffs of sandstone from 50 to 300 feet high. Through this ravine the river wound, forming deep reaches, sometimes several miles in length, and only separated by narrow banks of shingle or rock. The average course being nearly south, we soon reached lat. 16° S., when the valley suddenly expanded into a vast plain covered with excellent grass. In this plain were several isolated hills of trap or basalt, the decomposition of which adds much to the fertility of the soil.

Having traced the Victoria to lat. $16^{\circ} 26'$ S., long. $131^{\circ} 10'$ E., we returned to the camp, which was reached on the 13th December.

During our absence, such of the men as could be spared from the general duties of the camp, had been employed in cutting timber for strengthening the frame of the schooner.

The wet season had now set in, and the surface of the country became so soft, that the horses could scarcely be collected together at the camp.

The rugged character of the precipitous sandstone ranges which intersect the country, and the boggy condition of the plains, combined with the fact that the greater part of the horses, suited for draught, had been comprised in the number of those who had died, precluding the employment of the drays, it became necessary to explore the country with packhorses. Accordingly a party was organised, consisting of Mr. H. Gregory, Mr. Baines, Dr. Müller, and Messrs. Flood, Phibbs, Bowman, Deane and Fahey, thirty packhorses, and six saddle-horses.

With this party I started on the 3rd January, 1856, to explore the interior, south of the Victoria.

The flooded state of the country near the Victoria, compelled us to

traverse the rocky ranges to the westward of the river. The rugged nature of the country, the intense heat of the atmosphere, loaded with moisture, conjoined with the ordinary difficulties which attend exploration in a new country, rendered our progress extremely slow; many of the horses were lamed, though shod before starting, and two had died before we reached lat. 17° S.

I therefore selected a suitable spot for a dépôt in lat. $17^{\circ} 3'$ S., long. $130^{\circ} 35'$ E., and on the 31st January proceeded with Mr. H. Gregory, Dr. Müller, and Charles Deane, seven pack and four saddle horses, leaving the remainder of the party in charge of Mr. Baines.

Steering a southerly course, on the 7th February we reached the southernmost waters of the Victoria in lat. $18^{\circ} 12'$, long. $130^{\circ} 39'$, and crossed the dividing ridge between the waters flowing to the N.W. coast and those which fall into the interior; the elevation by barometric measurement being only 1300 feet above the level of the sea.* Continuing our route we descended into a nearly level and depressed country, and struck a small water-course trending to the S.E. On its banks there was abundance of grass, and a little water was found in the deeper portions of the channel.

This creek was followed to lat. $18^{\circ} 22'$ S., long. $130^{\circ} 49'$ E., where it was lost on a wide grassy plain, surrounded by level sandy country covered with triodia and stunted trees.

On the 9th, lat. $18^{\circ} 31'$, long. $130^{\circ} 44'$, was attained, but further progress was evidently impracticable, as we had reached a sandy desert country extending far to the south, in which neither water nor grass existed, little or no rain having fallen during the wet season; to the south of the dividing ridge, the elevation of this point was 1000 feet above the sea.

I now determined on following the northern limits of this desert to the westward, in hope of finding some creek or river, which, descending from the ranges to the north, might enable us to cross or at least penetrate this inhospitable region. Keeping therefore to the west along the foot of the sandstone range, on the 13th we came to the head of a creek in lat. 18° , long. 130° . This creek first trended N.W., but soon turned to the S.W.

For the first hundred miles, the country on the right bank consisted of vast level plains of rich soil, covered with beautiful grass; but the left bank presented a striking contrast in its low sandstone ranges, producing little besides triodia and scrub-trees.

The country on both banks now changed gradually to a sandy

* See Capt. Stokes's remarks at p. 191.—Ed.

desert, with low, barren sandstone hills, and long parallel ridges of red drifting sand, straight, equal in height, and with a direction exactly east and west. This desert country was not altogether destitute of vegetation, but thinly covered with triodia (the spinifex of Australian explorers), and a few scattered bushes of eucalyptus, acacia, and hakea.

After following this stream-bed, which I named Sturt's Creek, for nearly 300 miles, its channel terminated in a series of dry salt lakes, which occupied the lower portion of a large depression in the desert, the centre being in lat. $20^{\circ} 16'$ S., long. $127^{\circ} 35'$ E., and 900 feet above sea-level.

No outlet for the waters of these lakes could be discovered, though carefully sought for, and the great height at which the inundations of the country had remained for considerable periods, was evident from the abundance of mussel shells which remained in their natural position, embedded in the soil 20 feet above the dry bed of the lake, and more than a mile beyond its ordinary limits.

Surrounded on all sides by a sandy desert, in which it was hopeless to look for water or grass, and deprived of these essentials which the creek had afforded in sufficient quantity to enable us to proceed thus far into this inhospitable region, it was useless to attempt to penetrate the country to the southward, and no alternative remained but to retrace our steps while it continued practicable; for as no regular rains had fallen in this part of the country for at least twelve months, our supply had been generally derived from small muddy puddles, which resulted from heavy thunder showers which had fallen in the early part of the month. Most of these water-holes had now dried up, and I am doubtful whether our horses could have performed the long stages between the remaining watering-places, had not the open character of the country enabled us to travel at night, and thus avoid the scorching rays of an intertropical sun.

On the 11th March, we commenced retracing our steps up Sturt's Creek, and on the 24th, having reached the head of the creek, struck off to the N.E. to avoid the waterless country traversed on the outward route. In lat. $17^{\circ} 42'$, long. $129^{\circ} 58'$, we crossed the dividing ridge between the northern and southern waters, the elevation being 1660 feet above the sea, and, descending into a valley, came on a small dry creek trending N.W. This we followed for 30 miles, and then steered E.N.E. for 50 miles, over level grassy country, destitute of water, and reached the depôt camp, in the valley of the Victoria, on the 28th, found the party in good health and the horses much improved in condition.

As the horses I had employed on the excursion into the interior required a few days' rest, I selected six from those at the dépôt, and on the 2nd April, accompanied by Mr. H. Gregory, Mr. Baines, and John Fahey, proceeded to the eastward to examine the country in that direction. Traversing for 60 miles a splendid grassy country of trap formation, well watered by numerous creeks, we reached the eastern boundary of the valley of the Victoria, then turning northwards traced the river down to $16^{\circ} 26'$, and connected this route with that in December, 1855. Returning to the dépôt by a more direct route, we reached that camp on the 17th.

On the 21st, I broke up the dépôt camp and proceeded towards the lower part of the Victoria river, examining such portions of the right bank as had not been previously traversed, in order to ascertain if any considerable tributaries joined from the eastward, and on the 9th May reached the main camp.

The party at the main camp were all in good health except Henry Richards, who had lost the use of his right hand from falling down among some sharp reeds, one of which had pierced his wrist. The crew of the 'Tom Tough' had not escaped so well. The carpenter, John Finlay, had died on the 22nd April, and three of the seamen had been left on shore at the camp, that they might be under the immediate medical care of Mr. Elsey, the schooner having been moved down the river on the 2nd April.

Although this great amount of sickness is, in some degree, attributable to the re-development of previous disease, yet it more directly results from the bad quality and improper description of the provisions with which the vessel is supplied, and it has been absolutely necessary to furnish provisions from the stores of the Expedition for the use of the schooner's crew, their only remaining provisions consisting of salt beef of indifferent quality, biscuit much damaged by cockroaches, and tea.

The 'Tom Tough' was now moored below the shoals at Musquito Flats, and had been so far repaired by the unceasing energy of Captain Gourlay, that she was nearly ready for sea; a strong frame having been fixed inside the timbers, the seams caulked, and the butts secured. She now only makes 10 inches water per diem, whereas that was previously the usual quantity per hour. Great credit is due to the captain for the manner in which this work has been performed, having done all the smith's work and much of the carpentry with his own hands.

It is now my intention to proceed with the exploration of the country towards the Gulf of Carpentaria, and I have accordingly instructed the master of the 'Tom Tough' to proceed to Coepang for

supplies, and thence to the Albert River to co-operate with the land expedition.

The greatly reduced number of horses, and the impracticability of employing the drays for the conveyance of stores, have rendered necessary a modification in the manner and arrangement of the exploring parties, and on the present occasion I shall employ a party of seven persons, as it is desirable that the party should not be entirely dependent on the assistance of the vessel at the Albert River.

The remainder of the exploring party will proceed in the schooner to the Gulf of Carpentaria, and on the junction at the Albert River of the two sections of the Expedition, the party will be reorganised, and, if practicable, continue the overland route to Moreton Bay.

Enclosed I transmit a sketch* of the country traversed by the Expedition to the present time, and, as it may render it more intelligible, append a few remarks on the physical character of the country.

It may be considered to be a table-land of sandstone rising abruptly from the low land on the coast; it attains an average level of 700 feet on the banks of the Victoria in lat. 17° S.; 900 feet in lat. 16° ; 1600 feet in lat. 18° , which is the maximum, as the country falls to 1300 in 19° , and 1100 feet in lat. 20° .

The upper bed of sandstone is about 800 feet thick, and rests on soft white, green, and red shales, which are superincumbent on a coarse cherty limestone, and jasper. Large tracts of these two upper strata have been removed, and left large valleys and plains through which the rivers run. South of lat. $16^{\circ} 30'$ trap or basalt has been poured out into these valleys and formed plains or table-topped hills, sometimes isolated, but more commonly grouped together.

The sandstone, by its decomposition, usually forms a poor sandy soil, but occasionally fine grassy plains. The limestones, which occupy large extents of the valleys, are generally covered with a light loamy soil, producing abundance of grass; but the richest soil results from the decomposition of the trap rocks, which are so largely developed in the upper valleys of the Victoria, that at a moderate computation, they occupy a million of acres. This, added to the good country on the head of Sturt Creek, the lower part of the Victoria, and the Fitzmaurice, would make an aggregate of three million acres of available grazing land, already traversed by the Expedition.

Except iron ore, which is frequent, minerals are rare, only few traces of copper and slight indications of coal being observed.

Of the vegetable productions, little favourable can be said, for however interesting many of the plants may be to the scientific

* In the Map-room of the Society.—Ed.

botanist, yet, with the exception of the grasses, which are very numerous, there is scarcely a single vegetable production which can be rendered practically useful. Timber is scarce, the best growing near Point Pearce.

In conclusion, it gives me pleasure to record the ready co-operation and assistance I have experienced on the part of the officers, and the exemplary conduct of the men attached to the Expedition, and that, under circumstances of privation, which few, who have not experience, ever fully appreciate.

I have, &c.

(Signed)

A. C. GREGORY,

Commanding N. A. Expedition.

*To his Excellency Col. Sir W. T. Denison, R.E., F.R.G.S., &c.,
Governor-General of Australia.*

MR. MERIVALE, F.R.G.S., said he would only detain the Meeting a moment while he stated one or two facts concerning the Expedition, which had been received by Her Majesty's Government, but too late for communication to the Society. They had been received from Mr. M'Lean, H. M. Consul at Surabaya, in a report dated Sept. 3rd last. The account which had been read, left Mr. Gregory intending to despatch his schooner, the 'Tom Tough,' for repairs to Timor. It appeared that the schooner went to Timor, and she arrived in such a condition that some of the men considered their lives were unsafe, and they insisted upon the vessel being taken to Surabaya. She was accordingly taken there, and, having been examined, it was said that she could have got back from Timor, but that having come so far, and having to return against a strong head-wind, she would require much repair. Mr. Baines, with great promptitude, obtained another vessel, an English schooner, the 'Messenger,' which was at Surabaya, and on the 30th of August he left that place for the Gulf of Carpentaria, hoping to meet Mr. Gregory on its shores. Mr. Baines, however, expressed considerable alarm lest he should arrive too late, and Mr. Gregory should be reduced to straits. He hoped that these fears might prove unfounded, for it was believed that supplies had been sent by Sir W. Denison from New South Wales in a vessel called the 'Torch,' which would probably reach the Gulf before Mr. Baines arrived.

CAPTAIN STOKES, F.R.G.S., said no one could listen to the despatch just read with greater interest than himself, as he was one of the party that first discovered and explored the Victoria. It appeared that Mr. Gregory had examined one branch of the Victoria about 350 miles; or twice the distance, roughly speaking, that it was explored by the 'Beagle's' party. About 100 miles below the source of this branch, there was another coming from the south-east, which only appeared to have been traced down some 20 miles; but Captain Stokes believed that it led more into the interior, and was of greater consequence than the branch which Mr. Gregory had followed.* No doubt his instructions carried him to the south-west, and he naturally took the branch that led in that direction. His further journey, about 350 miles to the south-west, was one of great geographical interest, inasmuch as it showed the north-west boundary of the desert and the limits of the area drained by the rivers west of the Victoria. His account of the red drift sand, so exactly corresponded with what Captain Sturt met with some 400 or 500 miles eastward, that they might conclude that the whole of the intervening country was of the same character—a sandy

* See p. 187.—E.N.

desert, impassable, and fatal to any hopes of overland communication between South Australia and the North-west Coast. In support of this idea, Captain Stokes referred to Mr. Austin's expedition from Western Australia, where, about the parallel $26\frac{1}{2}^{\circ}$ and meridian 117° , he discovered the south-westerly boundary, evidently of the same sandy desert. It was an accumulation of lakes in rainy seasons, and of dry mud and arid sands in the hot seasons. Another indication of the extent of the desert, was the character of the central part of the North-west Coast, which Captain Stokes was the first to visit in the year 1841, when he was quite satisfied, from its singular resemblance to the Pampas of South America, that all within was a desert; and this would give a fair idea of its westerly limit. Going back to Mr. Gregory's exploration of the upper part of the Victoria, it appeared that he had met with a considerable extent of good country, which proved that the Victoria had not been overrated. Australia was, it was well known, deficient in navigable rivers, and when the Victoria was discovered and found navigable, it was regarded as an important stream; and, compared with the Murray in the south, it was called the great river of North Australia. The Victoria has this advantage over the Murray, that it always had a navigable entrance, while the mouth of the Murray was almost impassable. Mr. Gregory's discovery of so much good country on the Victoria, favoured the proposal to establish penal settlements in North Australia. He alluded to this, because the every-day police reports convinced him that the ticket-of-leave system was a failure, and transportation the only remedy. He would, in conclusion, express the hope that the same success would attend Mr. Gregory in the further and more important part of his expedition between the Victoria and the Albert. He should have much preferred that Mr. Gregory's instructions had confined him to tracing the chief sources of the Victoria, especially towards the south-east, and then proceeding eastwards to Carpentaria. If these had been his orders, what might have been the result? Instead of hearing of him still on the Victoria river, we would have heard of his arrival on the Albert.

The PRESIDENT said they were much indebted to Captain Stokes for his observations. When they remembered that Captain Stokes was present at the discovery of that river himself, and had traced it on foot for some distance inland, every word which fell from him must be of interest.

MR. LATROBE, F.R.G.S., congratulated the Society upon the success which had thus far attended this effort. He considered that it had been conducted upon the only principles which could induce them to look for good results, and if, as Sir Roderick Murchison said, the expeditionary party hugged the coast, they might really hope for great results. As to the interior, it appeared now to be a perfect blank on the map; he was afraid it would remain so, and that they might write upon it "*Sahara Australis*."

The peculiar character of the winds which proceeded from the great N.W. interior to that part of New Holland with which he was acquainted, showed that this interior must be a desert—an arid waste, throwing off an intense heat in summer, and, during the period of the winter rains, originating a chilly wind, possessing many of the peculiar characteristics of the hot winds. Like these, it appeared to move on a plane parallel to the earth's surface. It exercised a similar influence upon vegetation, causing plants to droop and the leaves of the acacia to close, although the winds from southward, bringing with them a far greater degree of cold, might produce no such effect. He hoped that they would remain satisfied with the attempts already made to penetrate directly into the interior beyond the head waters of known streams, and not risk the loss of life and tempt the fate of Leichhardt.

SIR RODERICK MURCHISON, in reply to a question of the President regarding the geology of North Australia, said he had little or no information to give respecting it, since no details had yet arrived. There were, indeed, a few

observations in the despatch of Mr. Gregory, and portions of a letter he had received from Mr. Wilson, the gentleman selected as geologist of the expedition, which would at a future meeting, be brought before the Society. The success which had already attended the expedition was highly gratifying to him, for he was one of its earliest advocates when the Duke of Newcastle was in office; and it was that statesman who first gave attention to the representations of the Geographical Society on the subject. What had fallen from Captain Stokes explained very clearly that object of the expedition which was considered of the greatest importance, *i. e.* not merely to discover the extent of the great interior saline desert, or whether there might or might not be a practicable route from Northern to Southern Australia; but to determine first the true water-parting, and having ascertained the source of the Victoria, then without further delay to travel along that high-land, and proceed at once to the Gulf of Carpentaria before the resources of the expedition were exhausted. He should, therefore, exceedingly regret, in conjunction with Captain Stokes, if through the exhaustion of their resources the leading objects of the expedition were not attained, by opening out that great line of intercourse which he hoped to see established between Sydney on the south and the Gulf of Carpentaria on the north. He hoped, however, that Mr. Gregory would have ample provision to enable him to effect that object. They must, at all events, give that gentleman all credit for having overcome great difficulties, and for having already solved a curious geographical problem. If he should demonstrate the practicability of the other suggestion, he will have achieved a most important result.

2. *Notes of a Journey up the Sadong River, in North-West Borneo.*

By A. R. WALLACE, F.R.G.S.*

THE Sadong is the first considerable river east of Sarawak, from which it is distant about 25 miles, and forms a portion of the territory lately ceded in perpetuity by the Sultan of Borneo to Sir James Brooke.

About 20 miles up this river, a small stream, the Simunjon, enters from the east, a few miles up which, on an isolated mountain, coal of good quality has been discovered, and is now being worked. At this place I spent the whole of the dry season of 1855, engaged in making collections of birds and insects, and more particularly in hunting the great orang-utan or "mias," which is there particularly abundant. I succeeded in shooting 13 of these extraordinary animals, and in accumulating a mass of information about them, which will, I trust, tend to clear up many obscure and doubtful points in their natural history. I had intended to devote the latter part of the dry season to a somewhat extended journey into the interior, but an unfortunate wound in my foot rendered me incapable of leaving the house for three months of the very finest weather, and it was not till the rains had begun that I was enabled to walk. As the time which I had fixed for leaving Borneo, was

* See Proceedings, R. G. S., No. IV. p. 97.—Ed.

now drawing near, I determined to return to Saráwak, by crossing the country between the head waters of the Sadong and Saráwak rivers; and as I am not aware of any account of this district or of its inhabitants having been published, or indeed of the whole of it having been previously visited by any European, I beg leave to submit my notes to the Royal Geographical Society.

The whole of the lower part of the Sadong valley is a forest plain, with scarcely a single spot of dry ground, except where a few isolated hills rise abruptly from it. It is a vast morass of a black vegetable mud, resting on a yellow clay. The surface is as nearly as possible on a level with the sea at high water. In such a country it may be supposed that the lower part of the river is monotonous enough. The banks are cultivated as paddy fields by the Dyaks and Malays; and their little thatch huts alone break the unpicturesque line of muddy banks, crowned with tall grasses and sedges, and backed by the tops of the forest trees behind the cultivated ground. It took me a day and a half from the mines to reach the Malay village of Gudong, where I stayed an hour to make some purchases of fruit and provisions, and called upon the Datu Bandar, or Malay governor of the place. His house was very spacious, but very dirty both outside and in. He was particular in his inquiries about the coal, the use of which the natives cannot realize. They are besides quite puzzled at the extensive and costly preparations made for working it. At the village of Jahi I found the stream so swift on account of a slight flood, that my heavy boat could make no way against it, and I was obliged to remain a day to obtain a smaller one, and fresh men to take me up to the first village of Hill Dyaks.

I succeeded here in meeting with a Malay boy, named Bujon, who wanted to return to Saráwak, and agreed to accompany me, and who, as he knew the language of the Sadong Dyaks, having traded among them, was a very important acquisition. Leaving Jahi in a very small open boat, we proceeded more pleasantly, and in a few hours got beyond the cultivated country to where the virgin forests come down to the water's edge. At night we had some difficulty in finding dry ground to sleep on, the river's banks being generally flooded. Early in the morning we reached Empugnan, a small Malay village, situate at the foot of a mountain of the same name, which had been visible from the mouth of the Simunjon river, and is apparently isolated. In the dry season the tide reaches this place. From here the vegetation becomes much finer. Large trees stretch out their arms across the stream, and the high earthy banks are clothed with ferns and scitamineous plants.

Early in the afternoon we arrived at Tabokan, the first village of the Senankan Dyaks. On an open space near the river about twenty boys were playing at a game, something like what we call 'prisoner's base;' their ornaments of beads and brass wire, and their gay coloured kerchiefs and waist-cloths, showing to much advantage and forming a very pleasing sight. Being called by Bujon, they immediately left their game to carry my things up to the round head-house, which is attached to most Dyak houses, and serves as the lodging for strangers, the place for trade, the sleeping-room for the unmarried youths, and the general council-chamber. It is generally elevated on very lofty posts, has a large fireplace in the middle, and windows in the roof all round, and forms a very pleasant and comfortable abode. In the evening, after dusk, the house was crowded with young men and boys who came to look at me. They were mostly fine young fellows, and I could not help admiring the simplicity and elegance of their costume. Their only dress is the long "chawat" or waist-cloth, the ends of which hang down before and behind. It is generally of blue cotton, ending in broad bands of red, blue, and white. Those who can afford it, wear a handkerchief on the head, which is either red with a narrow border of gold lace, or red, blue, and white like the "chawat." The large, flat, moon-shaped brass earrings, the masses of white or black beads round the neck, brass rings on the arms and legs, and armlets formed of sections of a great, white conical shell, all serve to relieve and set off the pure reddish brown skin and jet black hair. Add to this the little pouch containing materials for betel-chewing, and a long slender knife, both invariably worn at the side, and you have the everyday dress of the young Dyak gentleman.

The "orang-kaya," or rich man, as the chief of the tribe is called, now came in with several of the older men; and the "*bitchára*," or council, commenced about getting me men to go on the next morning. As I could not understand a word of their language, which is very different from the Malay, I took no part in the proceedings, but was represented by my boy Bujon. A Chinese trader was in the house, and he too wanted men the next day; but, on his hinting the same to the orang-kaya, he was sternly told that a white man's business was now being discussed, and he must wait another day before his could be thought about.

The next morning we started in a boat, about 30 feet long and 2 feet 4 inches wide. At this point, the stream abruptly changes its character. Hitherto it had been deep and smooth, though swiftly flowing, and confined by steep banks covered with vegetation. Now it rushed and rippled over a pebbly, sandy, or rocky bed, here and

there forming miniature cascades and rapids, and throwing up on one side or the other, extensive banks of finely-coloured pebbles. No paddling could make way against it, but the Dyaks with bamboo poles, propelled us along with great dexterity and swiftness, never losing their balance, though standing up and exerting much force in such a narrow and unsteady vessel. It was a brilliant day, and the cheerful exertions of the men, the rushing of the sparkling waters, with the bright and varied foliage, which, from either bank, stretched over our heads, produced an exhilarating sensation, which I had not felt since leaving the grander waters of South America.

Early in the afternoon we reached the village of Borotoi; and, though it would have been easy to reach the next one before the evening, I was obliged to stay, as my men wanted to return, and others could not possibly go on with me without the preliminary talking. Besides, a white man was too great a rarity to be allowed to escape, and their wives would never have forgiven them, if, when they returned from the fields, they found that such a curiosity had not been kept for their examination.

Walking out to a small hill near, cultivated as paddy fields, I had a fine view of the country, which was becoming quite hilly, and toward the south, mountainous. I took bearings and sketches of all that were visible, which much astonished the Dyaks, who accompanied me, and produced much conversation when we returned, with a request to exhibit the compass.

The next morning we proceeded as before; but the river had become so shallow and rapid, and the boats were all so small, that though I had nothing with me but a change of clothes and a gun, with the scantiest possible *batterie de cuisine*, two were required with five men to take me on. The rock, which appeared occasionally on the river's banks, was an indurated clay-slate, sometimes highly crystalline, and thrown up nearly vertical. To the right and left of us were isolated mountains, which I knew to be limestone by their peculiar outlines, and by the whiteness of the numerous precipices they presented, no doubt an extension to the eastward of the limestone of the Saráwak river. The river bed was a mass of pebbles, mostly pure white quartz, with, however, abundance of jasper and veined quartz, which often presented a beautiful appearance. It was only 10 in the morning when we arrived at Budw; and though there were plenty of people about, I could not induce them to allow me to go on to the next village, only three hours farther.

I walked out to the paddy fields, which are here very extensive, covering a number of the little hills and valleys into which the whole country seems broken up, and obtained a beautiful view of

hills and mountains in every direction. In the evening the "orang-kaya" came in full dress (a spangled velvet jacket, but no trousers), and invited me over to his house, where he gave me a seat of honour, under a canopy of white calico and coloured handkerchiefs. The great verandah was crowded with people, and large plates of rice, with cooked and fresh eggs, were placed on the ground as presents for me.

The costume of the Dyaks on ordinary occasions, though scanty, is highly becoming, but when they attempt to make themselves extremely fine on state occasions, they only succeed in becoming ridiculous. *In civilized countries it is the same.*

The river was now so shallow, that boats could ascend only with much trouble: I therefore preferred walking to the next village, first presenting the orang-kaya with some tobacco and a pickle-bottle, which latter he greatly esteemed. I had expected to see the country in this walk, but the path lay almost entirely through thickets of bamboo, which here springs up wherever the forest has been cleared away. The Dyaks get two crops off the ground in succession—one of paddy and one of sugar-cane, maize, and vegetables. The ground then remains eight or ten years before it is again cultivated—and soon becomes covered with bamboos, or grasses and shrubs, which often arch over the path and shut out everything from the view. At half-past nine we reached the village of Senankan, where I was again obliged to remain the whole day, which I at length agreed to do on the promise of the orang-kaya that his men should take me through two other villages across to Senna, on the Upper Saráwak River. I therefore amused myself as I best could, by walking about to the high grounds near, to get views of the country round till the evening, when another public audience, with gifts of rice and eggs, and drinking of rice-beer, took place. These Dyaks cultivate much ground, and supply a good deal of rice to Saráwak. They are rich in gongs, brass trays, wire, silver coins, and all such articles in which a Dyak's wealth consists, and their women and children were all highly ornamented. Here, as among most uncivilized people, there seems no gradual transition in the women between youth and age. From the pleasing and often elegantly formed girl of twelve or fourteen, a very few years of married life and hard labour, transforms them into coarse middle-aged women.

In the morning, after waiting some time, and the men that were to accompany me not making their appearance, I sent for the orang-kaya, and found that both he and another head man had gone out for the day, and on inquiring the reason of this extraordinary proceeding, was informed that they could not persuade any of their

men to go with me, as I afterwards found, because the journey was long and fatiguing. As I was determined to get on that day, I told the few men that remained, that the chiefs had behaved very badly, and I should acquaint the Rajah with their conduct, and that I insisted on proceeding at once. Every man present made some excuse, but after much trouble and two hours' delay, we succeeded in getting off. For the first few miles, our path lay over a country of a very singular character, cleared for paddy fields. It consisted of abrupt hills and valleys, very steep, but of very slight elevation, all terminating in sharp ridges and hillocks, with not a patch of level ground. It was a mountain region in miniature. After crossing the Kayan River, a fine stream, which is in fact a larger branch of the Sadong than the one I ascended, we were on the lower slopes of the Sebóran Mountain, and the path lay along a sharp ridge which led up to the mountain, and afforded an excellent view of the country round. The features were exactly those of the Himalaya in miniature, as described by Dr. Hooker, and might be considered as a natural model of some part of those vast mountains, on a scale of about one-tenth, thousands of feet being here represented by hundreds. I now found the source of the beautiful pebbles which had so pleased me all up the river. The slaty rocks had ceased, and all these mountains appeared to be a conglomerate sandstone, in some places a mere mass of pebbles cemented together. I ought to have known before that such a small stream could not produce such vast quantities of well-rounded fragments of quartz and agate. They had been produced in past ages by the action of some large continental stream, before the great island of Borneo had risen from the ocean.

About mid-day we reached the village of Menyerry, beautifully situated on a spur of the mountain, about 600 feet above the valley, and affording a delightful view of the mountain region of this part of Borneo. I here first got a view of the Penrhissen Mountain, at the head of the Saráwak River, and one of the highest, if not the highest in this district, rising probably to near 6000 feet above the sea-level. The Rowen Mountain to the south, seemed nearly equally lofty. It is situated near Sikyam, on a tributary of the Pontianak River; and in the same direction, but much more distant, appeared the lofty mountain Nutowan.

Descending from Menyerry we again crossed the Kayan, which bends round the foot of the spur; and ascended to the pass which separates the valleys of the Sadong and Saráwak Rivers, and forms the boundary of the Saráwak district. The height of this point must be about 2000 feet. The descent from here was very fine. A

deep rocky stream rushed on each side of us, down to one of which we gradually descended over numerous bamboo bridges, over the gulleys, or along the faces of precipices. Some of these were several hundred feet long, and fifty or sixty feet high, a single smooth bamboo 3 inches in diameter forming the only pathway, and a very shaky handrail of the same material, rendering the passage almost as perilous as that of the aerial bridge by which the followers of the Prophet are said to enter paradise.

Late in the afternoon we reached Sodos, situated on a space between two streams, but so surrounded by fruit-trees that little could be seen of the country. We stayed here for the night, and found the house very spacious, clean, and comfortable, and the people very civil and obliging.

In the morning early, we continued our descent to Senna, along a fine valley, with mountains rising 2000 or 3000 feet on every side. The stream rapidly increased in size till, when we reached Senna, it had become as large as the Sadong, above Tabokan, with the same abundance of sand and pebbles. Here too, the upheaved slaty rock again appeared, with the same dip and direction as in the Sadong. At Senna, I remained for the day, as the river was now navigable for boats to Saráwak. An unexpected difficulty however presented itself. The Senna Dyaks had no boats, they did not know how to make them, and never used them. It seemed strange to see people living by the side of such a fine stream without making use of it; but I found that they were true mountaineers, who had only come down the valley about twenty years ago, and had not yet got into new habits.

The people of Menyerry and Sodos are all of the same tribe. They make excellent paths and bridges, and cultivate a great extent of mountain land. Their district has therefore a more pleasing and civilized appearance, than in those places where the people move about only in boats, and confine their cultivation to the banks of the streams.

With some difficulty, I hired a boat from a Malay trader, to take me down to the next village, and found three Dyaks who had been several times with Malays to Saráwak, and thought they could manage a boat very well. They were, however, very awkward, constantly running aground, knocking up against rocks, losing their balance, and almost upsetting themselves and the boat, offering a striking contrast to the consummate skill in boatwork of most other Dyaks. At length we came to a really dangerous rapid where boats were often lost, and the men, conscious of their incapacity, were afraid to go on. Some Malays, with a boat-load of rice, here over-

took us, and, after passing down with great skill, kindly sent back one of their men to assist me. This he did very well, for my Dyaks, in the critical part of the passage, lost their balance, and had they been alone, would certainly have upset the boat. The river was exceedingly picturesque, the ground on each side being cleared at intervals for paddy-fields, affording a view of the country. Numerous little farm-houses were built high up in trees overhanging the river. They were reached from the bank by a bamboo bridge, and had a most curious appearance. At intervals, too, were hanging bridges crossing the stream, and suspended from trees on either side. One of them is well figured in Mr. Low's work on 'Sarawak.'

Reaching the village of the Sebungo Dyaks, I remained there that day, and the next proceeded to Sarawak, passing through a most beautiful country, where limestone mountains, with their fantastic forms, white precipices, and rich vegetation, shoot up on every side. In one of them is a cave which I visited, and which, except that it passes completely through the spur of a lofty mountain, offers nothing remarkable. The banks of the Sarawak river are everywhere covered with fruit-trees, the most numerous being the durian, a magnificent forest-tree, bearing a terrifically spiny fruit, the size of a melon, and which deserves to be ranked as the king of fruits. No tropical fruit, I have yet seen, can bear any comparison with it. They were ripe, and we enjoyed them to perfection.

I shall now proceed to a few general observations on the geography and geology of the country I passed through, and on the characteristics of its inhabitants.

Geography, &c.—Taking the latest map of Borneo as professing to represent the geography of the country, according to the best authorities, I will point out a few alterations which seem to me to be required. First then, the territory of Sarawak must be considerably extended; the boundary line passing rather south-east from Penrhissen Mountain, which exactly agrees in position with Mount Sebauh of the maps, and which will increase its area at least one-third. The mountain group at the head of the Sarawak and Sadong Rivers, is completely separated from the Cape Datu Mountain, which terminates in the Poey Mountain in lat. $1^{\circ} 35' N.$ South of this an extensive plain occurs, over which a fine view as far as the coast of Sambas, is obtained from the Serambo Mountain, near Sarawak. In the position occupied by Mount Raja on the map, *no hills exist*. Farther east, all the hills must be placed more to the south, and it seems probable from all the information I can obtain, that they soon cease altogether; a gently inclined divide, only, existing between the tributaries of the Batanglupar and those of the Kapuas

or Pontianak River. The Linga River, the first branch of the Batanglupar from the south, flows through a flat and swampy country almost from its source, near the Klingkang Mountain; and the passage from the higher part of the Batanglupar to the great lakes of the Upper Kapuas, is described as being over a scarcely elevated, certainly not a mountainous country. I am inclined, therefore, to believe that the little mountain district, from which flow the Saráwak and Sadong Rivers on the north, and the Sikyam and Landak on the south side, forms the central nucleus of the north-western end of Borneo. These rivers, in their upper part, are true mountain streams, flowing swiftly over gravelly beds, or rushing over rocky ledges, and forming so many little rapids and falls, that we cannot put their descent at less than 25 to 30 feet a-mile, probably much more. Now, on the Sadong, more than 30 miles of the river has this character, while 20 more is a deep and swift-flowing stream. This would give an elevation of a thousand feet for the base of this mountain region, showing that it differs essentially in character from those mountains nearer the coast, which, though of equal elevation, rise abruptly from a flat and marshy country which is scarcely elevated above the level of the high tides.

Geology.—The geology of the country is exceedingly difficult to elucidate, owing to its great complication, to the difficulty of obtaining sections, and the excessive rarity of organic remains. In no case have I been able to ascertain, by direct observation, the order of superposition of any of the formations. The most extensive formation in the country is a ferruginous sandstone conglomerate. This composes most of the mountains near the coast, and also the whole of the central mountain region. Between these and often in contact with them, occur limestone and porphyritic or trappean rocks, and a hard slaty rock, which is sometimes highly crystalline. The sandstone rocks are generally inclined at an angle of from 7 to 20 degrees with the horizon, while the slaty rocks are always nearly vertical. No distinct stratification is observable in the limestone, which forms abrupt and fantastically formed isolated mountains, often presenting mural precipices of much grandeur, and it is in these that the *hirundo esculenta* forms the gelatinous nests, which are so great an article of luxury with the Chinese. On my sketch-map* the dip and direction of the strata are noted, wherever I observed them.

It is in the sandstone and the clayey beds which alternate with it, that the coal occurs, and there seems little reason to doubt that it is of

* In the Map-room of the Society.—Ed.

the tertiary formation, as the most abundant fossils are impressions of exogenous foliage, exactly similar in character to that of the trees which now cover the surface. I have also seen what appear to be leguminous fruits, and the shells found in the Labuan coal-field, were all of an extremely recent type. Now as the sandstone of the interior almost exactly corresponds with that of the coal formation, we may conclude that it also is tertiary, the principal difference being, that some beds of it contain a greater quantity of quartz and limestone pebbles. The presence of volcanic rocks with contorted limestone, sufficiently explains the vertically-upheaved stratified rocks, which appear to underlay the sandstone. The limestone is highly crystalline, and is probably an ancient formation, as it contains slender-stemmed encrinites; and the slaty rocks which occur in all the river beds between the coal mountains and those of the interior, are probably of equal or greater antiquity. A considerable tract of country between the limestone hills, is covered with an alluvium of gravel and clays, the surface of which is very undulating, and in this the gold-washing is principally carried on. It seems to rest upon the limestone, which often pierces through it in strange water-worn peaks, which resemble ruined buildings, or ancient monuments. It is in cavities of the limestone also, that the antimony ore is found; and near the junction of the trap-rock with the limestone, a fine hot spring has recently been discovered.

We may therefore, in general terms, describe the Sarawak district as consisting of ancient limestone and slaty rocks and of modern sandstone with coal. In the interval between these deposits, violent volcanic action has taken place, which has resulted in the trappean mountains; and this action has been renewed since the most recent rocks have been formed. With the very scanty information we yet possess on the subject, more detail than this would be out of place.

Ethnology.—The manners and customs of the Aborigines of Borneo have been so often described, that I shall only now make a few observations on what has been less generally noticed—their physical, mental, and moral characteristics. The Dyak is closely allied ethnographically to the Malay, more remotely to the Chinese and to the Indians of South America, who are all united by so many similarities, that we must consider them as branches of one great division of mankind, the Mongolian race. All are characterised by a reddish brown skin of various shades, by jet-black straight hair, by the scanty or totally absent beard, by the rather small and broad nose, and high cheek-bones. In one character only is there any disagreement among them;—in the Chinese and Tartar races the eyes are oblique, while in the Americans and Malays this

peculiarity either does not exist, or is very slightly developed. The average stature of the Dyaks, seems intermediate between the Malays and Chinese, being rather greater than the former and less than the latter, though the local differences are in all very great. Their whole forms are well proportioned, their hands and feet small, and they are seldom so stout as either the Chinese or Malays, while the coronal region of the head, is better developed than in the latter races.

It is highly curious that countries so distant as Borneo and the valley of the Amazon, between which we can by no possibility imagine any direct communication to have ever taken place, should yet contain indigenes so similar to each other; for between some tribes of Dyaks and of Amazon Indians, I can call to mind no one physical distinction. We can only explain the circumstance by supposing both to have had a common origin, and shall thus have additional reason for supporting the views of Dr. Latham and others, who consider the Americans as Mongols who have emigrated direct from Eastern Asia. We may also suppose that similarity of climate and other physical conditions, have tended to produce the remarkable resemblance I have alluded to, both tribes inhabiting districts under the Equator, where the surface is everywhere covered with virgin forests, and where excessive heat and moisture constantly prevail.

In mental capacity it is probable that the Dyaks would be fully equal to the Malays or Chinese, while in moral character they are undoubtedly superior to either. They may be said to bear the same relation to the Malays, that the Tartars do to the Chinese. They are simple and honest, and become the prey of the Malay traders and chiefs, who cheat and oppress them whenever they have the opportunity. The Dyak languages are very various, and differ very considerably from each other. In some, nearly half the words are pure or modified Malay, while in others, there is scarcely a word exactly the same in the two languages. In some of the names of places, there is a strange similarity to the Celtic; thus, *Penrhissen*, *Lundu*, *Sinixoen*, *Senna*, are most of them true Welsh names, and as the Celtic languages have an Eastern origin, and there is a considerable Sanscrit element in the Malay, and as besides there is reason to believe that Hindoos were once settled in Borneo, it seems possible that these are not mere accidental coincidences, but indications of a common origin of the former inhabitants or languages of Britain and Borneo—countries which we can now only place in juxtaposition, as representing nearly the extreme points on the scale of civilization.

Having compared the Dyaks with some of the indigenes of South America as to their physical characters, it may be as well to extend

the comparison to their mental qualities as exhibited by their sports, their weapons, and their general habits. In these too there is a very considerable general resemblance, though much difference in the details. The Dyaks are more lively, more talkative, and less diffident than the Americans, and therefore pleasanter companions. They have more amusements and are more social, while at the same time they have less variety of weapons, and are less skilful in their methods of obtaining game and fish. Both these circumstances will lead us to place them one degree higher in the scale of civilization. Among the Indian boys of the Amazons, I never observed any other amusements, than imitations of the more serious occupations of the men. The bow and spear, the blowpipe or the canoe, were employed in their sports and games, which were thus the school in which they became qualified for the duties of manhood. This is a characteristic of the truly savage state. The Dyak youths, on the other hand, have their social games, their trials of strength and of skill. They amuse themselves with pegtops like our English schoolboys, and I was surprised to find them fully initiated in all the mysteries of the in-doors game of "scratch-cradle," of which they had modifications unknown to us. They possess besides numerous puzzles and tricks of great ingenuity, with which they amuse themselves on dull evenings or during wet weather. These apparently trifling matters are yet of some importance, in arriving at a true estimation of their social state. They show that these people have passed beyond that first stage of savage life, in which the struggle for existence absorbs their whole faculties, in which every thought and every idea is connected with war or hunting or the provision for their immediate necessities. It shows too an advanced capability of civilization, an aptitude to enjoy other than mere sensual pleasures, which, properly taken advantage of, may be of great use in an attempt to raise their social and mental condition.

The moral character of the Dyaks is undoubtedly high. They are truthful and honest to a remarkable degree. It is often impossible from this cause to get an opinion from them, for they say, "If I were to tell you what I don't know, I might tell a lie;" and if they relate any thing voluntarily, you may be sure that they are speaking the truth. The fruit-trees about their houses have each their owner, and it has often happened that on asking a Dyak to gather me some fruit from a tree, he has replied, "I can't do that, for the owner of the tree is not here;" never seeming to contemplate the possibility of acting otherwise. Neither will they take the smallest thing belonging to a European, without asking permission. They will pick up scraps of torn newspapers or crooked pins, and ask as a

great favour whether they may have them. In other moral qualities they are also above most uncivilized, and perhaps also above most civilized, nations. They are temperate in food and drink, and the gross sensuality of the Chinese and Malays is unknown among them. They have but one fault—a fault common to all nations in a half-savage state, except perhaps the African races—an apathy and dilatoriness, which, however annoying to the Europeans who come into contact with them, cannot be considered a very grave offence, or be held to outbalance the many excellent qualities they possess.

Few subjects are of greater interest, or of more vital importance to the welfare of a people, than the state of the population, its increase or decrease, and the causes by which it is affected. In my visits to the Hill Dyaks, I was much struck by the apparent absence of those causes, which are generally supposed to check the increase of population, coupled with the evidence of a population almost stationary or very slightly increasing. The conditions generally supposed most favourable for the increase of population, are an abundance of food, the absence of polygamy, and early marriages. Here these conditions all exist. The people produce far more food than they consume, and exchange the surplus for ornaments, gongs, and small cannon, which constitute their wealth. On the whole, they appear remarkably free from disease; marriages take place early, though not too early, and old bachelors and old maids are alike unknown. The number of births is, however, below the usual ratio, and a sufficient cause may be found in the fatiguing occupations to which the women are subjected.

3. *Proposed Exploration of Borneo.* By Lieut. C. A. C. DE CRESPIGNY,
R.N., F.R.G.S.

LIEUT. DE CRESPIGNY, R.N., submitted his proposition for the more thorough exploration of Borneo. He reasoned that Borneo ought to be better known, on account of its riches, its fertility, and above all, its position, situated as it is, in the direct route between China and Australia, between which two countries, it is not difficult to foresee, that there will be as great a trade as now exists between Europe and Australia. In addition to this, Lieut. De Crespigny was anxious to discover the ruins of a large stone city said to exist in Koti, in the east of Borneo, and the truth of a rumour of a tribe of fair people, living in the mountainous region of Kinibalu, with light hair and blue eyes. In reply to a question Lieut. De Crespigny said he had been employed in the survey of the north-west coast in 1848, and had taken that opportunity to learn the Malay language, and to gain information of the manners of the people.

He was of opinion that the character of both Malays and Dyaks had not been fairly reported upon. He knew them to be hospitable and honest, and did not think the Malays had a fault. The Dyaks certainly were addicted to taking heads, but upon the whole they were an inoffensive race, and he felt confident that he would be well received by them.

With regard to the means, he proposed that the Society should use their influence with the Admiralty, to have him placed upon full pay on the books of one of the guard-ships in this country, to provide him and his servant a passage to Labuan, and to lend him a few instruments and a small medicine-chest from their stores, and provide him with one or two other necessaries. Should this application fail, it would make no difference in his resolution, but it was absolutely necessary that he should be found a passage to Labuan.

He then pointed out the curious fact, that the north-west coast, which has been visited by so many of our ships, and which is the most important part of the country, is not known beyond a hundred yards in the jungle, with the exception of a few places, three of which, viz., Rejang, Bruni, and Tampanak, he had seen.*

The PRESIDENT said, when they considered the vast extent of country proposed to be traversed, no less than 600 miles in length and ten or eleven degrees of longitude in breadth, the nature of the climate and the reputed character of the natives—considering, too, that Lieutenant De Crespigny desired no assistance, no companions, that he intended to travel alone—he could not but admire his courage and enterprise. There was, besides, a further independence about this undertaking: the Lieutenant sought no aid from the Government or from that Society, or any Society, beyond that which the Admiralty might reasonably grant, which was, his full pay and a free passage to the site of his proposed adventures. When he looked at the vast extent of the route which he proposed to traverse, the opening out of a country said to abound in minerals and other valuable productions, and promising to be of great commercial importance, he could only hope that the project might be successfully carried out; that the Admiralty would listen to the proposal, and that the Society might have the happiness and advantage of reading in this room the relation of the successful performances of his enterprising and gallant friend.

MR. JOHN CRAWFURD, F.R.G.S., trusted that Lieutenant De Crespigny would have the support of that Society—he thoroughly deserved it; and that the Society would strongly recommend his case to the patronage of the Government. Previously to Mr. Wallace, whose journey had just been described to the Society, two travellers had already gone in among them, one from the north-west side, and the other from the south side—Mr. Dalton and Mr. Burns, a grandson of the poet. Borneo was nearly five times the extent of Great Britain, and nine times the extent of Ireland. It was inhabited by a rude people. There were upwards of 100 different tribes at the least; he had himself counted upwards of 50; and every one of these had a totally distinct and separate language. In fact in this respect, as well as in some others, Borneo far more resembled a huge block cut out of tropical America or tropical Africa, than any other country in the world. Now, as to its productions. It was not

* See preceding paper by Mr. Wallace.—Ed.

rich in vegetation useful to man. The island had, however, a great variety of valuable minerals. It is indeed the richest mineral country in the East. Its coal formations were most extensive, stretching right across from Bruni to Banjarmassin. Mines are worked at both extremities; by the English at the north-west, and by the Dutch at the south side. An English company, called the Eastern Archipelago Company, was mining upon an extensive scale, and had invested an immense sum of money, not less perhaps than 160,000*l.*, consisting of steam-engines, pumps, and there was even a railway of a mile. It was expected soon to produce 60,000 tons of coals a-year. They knew the vast demand likely to arise for coal in connexion with our Eastern steam navigation. Iron was very abundant: he believed it to be a magnetic ore, from which the Dyaks are enabled to manufacture steel and iron superior to the best Swedish; at least it was so in the estimation of the natives, because they gave a higher price for it. Sulphuret of antimony was found in considerable abundance, more plentifully than in any other country. The history of the discovery of that mineral was curious enough. A gentleman of his acquaintance, like many other English gentlemen fond of scribbling in newspapers, wanted a subject to write about. He went to a bazaar for one, and found it in a mass of antimony. This was in 1823. A small portion of it was smelted to a regulus, and it turned out to be a sulphuret that had been brought from Sarawak; and most of the antimony we now import, 1500 tons annually, comes from that country. Sir James Brooke, by the aid of these antimony mines, was enabled to maintain the best government, native or European, ever established in Borneo. He had a population of nearly 30,000 under his authority, consisting of Dyaks and a great many other tribes; and considering what a strange, rude, anomalous population he has under him, it is certain he administers his government with eminent skill. Gold is produced in considerable quantities on the west coast. He believed there were 50,000 Chinese working the gold mines on the west coast, but they were much discouraged by the Dutch government. They produced about half a million pounds sterling annually, which is about one-thirtieth part of the produce of California or Australia, and that after they have been working there for a whole century. Diamonds were also produced. Among the vegetable productions was gutta percha, discovered by a relative of his in 1847. He saw small quantities of it employed in making knife-handles and horse-whips. Being in the medical profession, he thought that gutta percha would make very good splints and bougies, and he sent portions of it to Bengal, and those specimens are now in the East India House: that was the beginning. He received the gold medal of the Society of Arts; and the President of the India Board, at Mr. Crawford's request, had the kindness to confer upon his son a very handsome appointment in the service. From the returns of the Board of Trade, he saw that there had been imported of gutta percha, almost all from Borneo and Sumatra, not less than 23,000 cwts. With the assistance of this gutta percha, we knew what we were able to do; we shall be able, for example, to interchange conversation with our cousins across the Atlantic, in the course of a few months. There was another article of vegetable growth produced in Borneo that was curious enough—india-rubber, caoutchouc. Forty years ago, half a ton of india-rubber would serve Europe for ten years. The article was then used only for rubbing out pencil marks. The quantity now imported was 45,000 cwt. annually, and formed the raw material of a vast number of articles. The total value of it was 350,000*l.* Borneo produced sago, now become a considerable article. All these were things of modern discovery; and he had no doubt that Lieutenant De Crespigny, in the course of his journeys, would be able to discover a great many more. He possessed qualifications that well fitted him for the task he had undertaken; and he earnestly hoped, on the return of that gentleman, that they should be all present to hear his interesting papers read.

The PRESIDENT said Mr. Crawford had given a very interesting and instructive description of the country which Lieut. De Crespigny was about to explore. He was sure all would join with Mr. Crawford in his hearty wishes for his success. The Council of the Society had expressed its desire that day that the Admiralty should be moved to grant Mr. De Crespigny's request. They could only hope that the Government would promote his views in every way, as he was sure the Society, judging from the expression of the sentiments of those present, would be disposed to do. Before the President adjourned, he directed the attention of the Meeting to an application of one of the many valuable productions of Borneo, in the shape of the gutta percha forming part of the submarine cable about to be stretched between this country and America; and adverted to the admirable section upon the walls of the room, of that part of the Atlantic in which the cable would lie, as delineated by Mr. Cyrus Field, from the survey of Lieutenant Berryman, of the U.S. Navy.

Second Meeting, Nov. 24, 1856.

SIR RODERICK I. MURCHISON, VICE-PRESIDENT, in the Chair.

ELECTIONS.—*Captain E. A. Acheson; Dr. Phil. H. Barth; Lieutenant L. Brine, R.N.; Captain W. Brook; Captain E. Cooper; and Messrs. J. W. Childers; J. A. Beaumont; J. D. C. Ewing; G. M. Harrison; A. B. Hill; J. R. Langer; J. Palliser; H. S. Reid; J. M. Share, R.N.; E. H. Stanley; J. L. Statham; and James Vaughan, M.D., were elected Fellows.*

DONATIONS.—Among donations received since the previous meeting were 'Le Moniteur des Indes, Orientales et Occidentales,' 3 vols. 4to., presented by Mr. J. Crawford, F.R.G.S.; Redhouse's 'English and Turkish Dictionary,' presented by Mr. Quaritch; 'Treasury of Geography,' by Mr. Wm. Hughes, F.R.G.S.; 'Series of Twelve Views in the Black Sea and the Bosphorus,' by Commander Montagu O'Reilly, R.N., F.R.G.S.; Reports of Explorations and Surveys in the United States; the Transactions of the Smithsonian Institution of Washington, of the Boston Society of Natural History, the German Oriental Society, the Imperial Geological Society of Vienna; the Royal Institute of Dutch India, &c.

OBJECTS EXHIBITED.—Various articles, relics of Sir John Franklin's expedition, obtained from the Esquimaux at Repulse Bay by Dr. Rae; and others, sent home by Mr. Anderson, from Montreal Island, were exhibited through the kindness of Mr. Tonna, F.R.G.S., Secretary of the United Service Institution, and excited much interest.

ANNOUNCEMENTS.—The CHAIRMAN stated that the members would be aware that, at their last meeting, a resolution was unanimously passed, to express their deep regret that their distinguished medallist, Dr. Kane, was prevented by

illness from attending in person to receive those gratulations which they were all ready to offer him. The President of the Society, Admiral Beechey, who he regretted to say had been prevented by ill health from taking the chair, had requested him to state the gratification he had experienced in waiting upon Dr. Kane, and in expressing the feelings of admiration entertained by the Geographical Society towards that eminent traveller. The reply which Admiral Beechey received was as follows :—

Champion Hill, Camberwell, Nov. 16, 1856.

MY DEAR SIR,—May I avail myself of your kindness to convey to the Society over which you preside, my sense of the high honour which, in the form of a resolution of welcome, was this day conveyed to me by you in person.

I regret that my extreme illness compels me to devolve this grateful duty upon another hand, but I know that you will make the necessary explanations to the Society.

I am, my dear Sir, with great regard,

Your obedient servant,

E. K. KANE, U.S. Navy.

Rear-Admiral F. W. Beechey, President R.G.S.

It was only necessary on his part to explain that Dr. Kane had, by order of his physicians, already proceeded on a voyage to the Havanna, and to add that it was no doubt the hearty wish of every British geographer that this distinguished man might be soon restored to health.

He, the Chairman, had also to announce that, since the last meeting, the Admiralty had acceded to the wish expressed by the President—a favour not granted on ordinary occasions—that Lieut. De Crespigny, F.R.G.S., the adventurous young officer who had volunteered to survey in various directions the extensive island of Borneo, should be allowed to proceed on the proposed expedition. The Admiralty received, it appears, the proposition very favourably, and had not only granted leave to Lieut. De Crespigny, but also a free passage in H.M.S. 'Actæon.' Upon the application of another naval officer, they were so liberal that they also granted permission to him to accompany Lieut. De Crespigny. He mentioned this circumstance with great satisfaction, as it showed that the Admiralty were fully aware of the position in public estimation which the Royal Geographical Society justly occupied. In fact, all the departments of the Government seemed anxious to attend to the recommendations and wishes of this Society.

He might further announce that the wishes of the deputation which waited upon the Earl of Clarendon, to urge his Lordship to sanction an annual expedition to the Niger and Chadda, like that successful one under Dr. Baikie, in order to bring us into systematic communication with the people of that portion of Africa, had met with the entire concurrence of her Majesty's Foreign Secretary. He felt confident, from what he heard on that occasion, that the Government would carry out the wishes, which had been long entertained by geographers. These were very gratifying results, and he need scarcely say the Society was flourishing, seeing so many new members added to it at every meeting.

The papers read were :—

1. *Plan for a farther Search after the Remains of the Franklin Expedition.*

By Lieut. BEDFORD PIM, R.N., F.R.G.S.

LIEUT. PIM stated that as a decisive clue of the missing expedition had been obtained, in the shape of the relics purchased by Dr. Rae

from the Esquimaux during his survey of part of Boothia, it was natural to look for the solution of the mystery to the locality of King William Land. He ascribed the failure of the last expedition sent out by the Hudson Bay Company to follow up the traces of Franklin discovered by Dr. Rae, to various causes, but chiefly to the lateness of the period of the year when they started and to the absence of an interpreter; and denied the existence of any evidence proving that the party had perished, since no vestige of human remains had been found, which would otherwise have been the case. The scheme he proposed was, that a screw steamer, with a complement of twenty men, should penetrate as far down Peel Sound as possible, take up winter quarters, and, assisted by teams of dogs, purchased at the Danish settlements of Greenland, extend the search down both sides of the Sound. Another steamer should push through Behring Strait and winter at King William Land; and a third party should descend the Great Fish River. Lieut. Pim particularly desired the use of small steamers, supplied with dogs for travelling purposes. Who could doubt that, had Sir John Franklin had the command of 20 men only, instead of 138, but he would have escaped from his icy prison as easily as Sir John Ross had done? The smaller number would enjoy abundance, while the larger number were perishing with hunger. The superiority of dogs over men for sledging purposes had, in Lieutenant Pim's opinion, been abundantly proved—frost being the most dreaded enemy of the men, whilst dogs are exposed to the severest inclemency of the weather with impunity. The most interesting locality for the search, was undoubtedly, King William Land; which, situated at the mouth of the Great Fish River, was, on account of its proximity to the magnetic pole, and the number of Esquimaux inhabiting its vicinity, who beyond a doubt were the depositaries of the Franklin secret, of the greatest importance. Having pointed out the field of search, Lieutenant Pim described the eastern road to it, or that by Lancaster Sound, as comparatively uncertain; while the western, or that through Behring Strait, he believed could be coasted by ships sooner or later in each year, along the northern shores of the American Continent. Captain Collinson had engaged to take a ship to Simpson Bay in ten months, and, indeed, had given it as his opinion to him, that he could take through the 'Marlborough,' the largest ship in the British navy.*

* Lieut. Pim exhibited the fac-simile of a Chart drawn by an Esquimaux, on board the 'Enterprise,' pointing out the locality of two ships; but which Capt. Collinson, at the time, supposed to refer to the 'Victory,' abandoned by Sir John Ross in 1831.—En.

SIR RODERICK MURCHISON, F.R.G.S., was sure the members would return their thanks to Lieutenant Pim for his communication, inasmuch as they would recollect the efforts made by that officer in the search after our missing navigators. No one could forget the bold enterprise which Lieutenant Pim formerly projected, the vigorous manner in which he set about it, with the full determination to reach, by a land journey over the wilds of Siberia, those distant regions in which Franklin and his associates were supposed to be fast bound in ice. Lieutenant Pim's antecedents were indeed an earnest that what he now proposed was worthy of the serious consideration of the Society. He, the Chairman, had been alluded to as having been one of the individuals, who had zealously advocated a final search for the relics of the 'Erebus' and 'Terror.' He, certainly, did take a very deep interest in the memorial which he himself presented to the First Minister of the Crown upon this subject; and he must say, that this document, signed as it was by many men eminent in science, as well as by experienced Arctic explorers, met with the full and entire favour of Lord Palmerston, who paid a very marked attention to it. Though he, Sir Roderick, had no right to hold out any prospect upon authority, it might still be hoped that Her Majesty's Government would think it due to the honour of a great country like Britain, which had spent so many thousands of pounds in the search after Franklin, not to abandon a last effort to detect the relics of the ships, and probably to find the log-books, and such records of those six years' wanderings in the far-off Arctic regions, as might well be preserved in the ice, and might be found by a survey in a circumscribed area. The Society would recollect, that this proposed expedition differed entirely from all former efforts to discover the direction even, in which the bold and gallant Franklin had sailed. Through the discoveries of Dr. Rae, we now know that within a very limited space indeed, the ships and their relics must lie. Again, that the spot could be easily reached, had been set at rest by Captain Collinson, who in a sailing ship passed to within one hundred and fifty miles of the area to which he adverted, along the north coast of America, and returned unscathed and without the loss of a man. If a screw vessel were propelled in that same course, there could not be the remotest doubt that one portion of the proposed scheme might be accomplished. Not being a naval man himself, he did not pretend to enter into the relative merits of an expedition by the east or the west. These were points which might be considered hereafter; but he did sincerely hope that a last effort might be made for the honour of our country. Our neighbours, the French, as stated in the memorial alluded to, in the case of the unfortunate catastrophe that befell *La Perouse*, had set an example, which, for the credit of our country, we ought to imitate. The moment our allies procured the first information respecting that ill-starred expedition, they sent out a considerable force to collect every remnant and record connected with it. These they had justly hung up as trophies in Paris, and such conduct was well worthy of imitation by other nations. In the event of the Government declining to send out an expedition, he was authorized to state that Lady Franklin, who had already expended so much in fitting out expeditions in the search after the missing navigators, would, though there might now be no chance of finding a living man of the party, spend her last farthing in making this effort. He still hoped that the Government would give to that noble-minded woman every possible support, and furnish the expedition with provisions and instruments, and with a well-found vessel.

DR. RAE, F.R.G.S., said he had done, as no doubt others had when employed for the purpose, all he could to find traces of the missing expedition; but Lieut. Pim was perfectly right in saying that his discovery of relics in the region named was *unexpected*. He thought Sir John Franklin had gone in another direction; because on a former expedition Sir John had lost half his party in

travelling over a short extent of the American continent. He concluded that Sir John Franklin would have followed the route taken by Sir John Ross in escaping from Regent Inlet; and this opinion induced him to think that he was not to be found in the neighbourhood where relics had been met with. He did not think, with many other authorities, that documents were to be found. The documents, whatever they were, would have been carried to the point where the last survivors rested. That was his opinion. The Esquimaux told him that they had found eight or ten books where the dead bodies were; that those books had "markings" upon them, but they could not tell whether they were in print or manuscript. On being asked what they had done with them, they said they had given them to their children, who had torn them up as playthings. This was such an answer as the Esquimaux would scarcely have formed from mere invention; it was just what children would do in this country or anywhere else. But wherever the vessels were left, there it was barely possible that remnants of books might be found; still it was clear that those books could give no account of the fate of the party seen near the Fish River. There was only one point connected with the discoveries made by Mr. Anderson, which at first appeared to him inconclusive, and that was the not finding traces of bodies. Upon considering the subject, and consulting Sir George Back's book, he came to the conclusion that they had been washed away or covered up with mud. On the low ground where the party encamped, the tide flowed nearly over the whole of it, in gales of wind from certain directions. There was a large river flowing down, and all who have lived in the northern parts of America, know the effect of such a river filled with ice flowing over a flat tract of country; that it carried away remains of much greater resistance than any that mere bodies could offer. He might also refer to Captain Penny in confirmation of this view of the case. When Captain Penny wintered up Northumberland Inlet, he found that whales' carcasses and bones, which he had left nearly high and dry the previous season, had been removed by a process he could not account for; there was not a bone to be seen. With respect to the expedition proposed by Lieutenant Pim, he wished it might be carried out, because he thought that the information obtained, *if any*, would confirm the statements he had himself brought home. He would not at present say exactly what his plans were, but he wished to complete the survey of the north coast of America, which he had twice endeavoured to accomplish. It was said that the third time was lucky, and he should probably try the third time.

MR. JOHN BROWN, F.R.G.S., wished to make an observation with reference to Peel Sound. He would caution geographers against the adoption of it as a Strait. It was not known to be a Strait. If they referred to the Blue Books they would find that Lieut. Browne, of Austin and Ommaney's expedition, went some distance down that Sound, and in his report pronounced it to all appearance "rarely if ever open for navigation;" in fact, he said, in parts it was frozen to the bottom. A little farther south, at Creswell Bay, by reference to Sir John Ross's trip down Prince Regent Inlet, they would find, looking west, a range of mountains—the Union Mountains—these must be some distance to the westward; they were very high; this again offered an obstacle to the supposition that Peel Sound was a strait. Again, farther south, at the western entrance of Bellot Strait, Capt. Kennedy and Bellot describe a "continuous barrier of land" from Cape Bird round to the north and west, forming a deep bay; this would shut out all idea then of Peel Sound being a strait. He would be sorry to see another failure by a search in that direction, after the many they had had. Probably the best place to put the ships would be down Prince Regent Inlet, but not so far south as to be locked up as Ross was,—say about Creswell Bay. But, after all, where, he would ask, did the party said to have perished at Montreal Island come from? He did not think

they came down Peel Sound at all; had they done so, we should have expected to have found traces of them from its vicinity to Fury Beach. He thought Franklin, in his endeavours to carry out his instructions, had attained large westing from Cape Walker, as far west as 105° or 110° , and had got entangled by the heavy ice in the deep bay of Melville Sound, and that he endeavoured to escape south by a strait which he (Mr. Brown) thought existed at the bottom of Melville Sound, between it and Gateshead Island, in King William Land. In 1854, he expressed to Captain Collinson, just then arrived, his opinion as regarded that particular part being a Strait. The heavy fixed ice on the eastern side of Melville Sound, found by Captain Ommaney and Captain Osborn, the currents and other reasons, too long to be entered upon then, had led him to that conclusion. Captain Collinson said, he "thought it probable, and yet the thought never occurred to him when he was on the spot." He mentioned this to prevent future failure. At any rate the fate of Franklin and his followers could not rest where it was, and he thought if they went down Prince Regent Inlet, and then crossed over as Kennedy and Bellot did, and in the direction he (Mr. Brown) had indicated, that they might obtain traces of the relics at least, of the long absent expedition. The way by Behring Strait was an excellent one, but he feared it took too long a time from England.

CAPTAIN MAGUIRE, R.N., said, he had been to Behring Strait four times, and as to the possibility of communicating with the mouth of Back River by the western route, he might state that he had been round Point Barrow three times, and he thought it was a navigation which might be undertaken without the slightest danger. Captain Collinson was of the same opinion. The advantages of the western route were threefold: 1st, the certainty of the ships arriving at the spot where the search has to be made; 2nd, in the event of any accident occurring to the vessel, the crew will be sure to reach the Hudson Bay settlements; 3rdly, that a travelling party (coming from the east) could not remain sufficiently long upon the spot so as to render the search complete and final. By this route, notice of the ship's progress can be conveyed by the Rat Indians from the Colville, and from Barter Island to Fort Youcon, and her safe arrival at her destination can be made known in England by the January following. Thus there would be no anxiety with regard to her safety. A vessel could get round by September; but by the eastern route it would be the spring following, before parties could reach there by travelling. This was a point of some importance, because information could not be got from the Esquimaux in a day or two. It took weeks, and it was very difficult to get correct information from them. By the western route, the passage from England to the mouth of Back River, could be undertaken with very little chance of stoppage. Captain Collinson had made the passage in one year, and Captain McClure in another, and they each could have got there by the month of September. A ship having arrived there, it would be very easy in the following spring, when the crews would not be employed about anything else, to try and find a way out by the eastward instead of returning as they went. But ships going in by the east, did not know how far they could get, and it was well known that Arctic travelling was a very laborious thing. People arriving at a place after a long journey, were not in a state to make a search with the same vigour they would exert if they were quite fresh.

SIR RODERICK MURCHISON said, it was interesting to find that the remarks made by Lieut. Pim had been confirmed by so experienced an Arctic navigator as Captain Maguire, whose observations were quite in unison with those of Captain Collinson—both of these officers who had "gone and done the thing." The public must therefore not imagine that the search that the memorialists and Lieut. Pim advocated, was attended by those dangers which were connected with former indefinite searches. With reference to the cha-

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rafter of the Esquimaux, among whom some of our people might have lost their lives, and some of our young men might be living, which was the opinion of Dr. Kane, he, Sir Roderick, hoped that the Bishop of Rupert Land, who was present, might afford them some information.

THE BISHOP OF RUPERT LAND said his knowledge of the Esquimaux was very small. He had encountered them in two directions in his own territory; at one extremity near James' Bay, and at the other above York Fort. He had seen and conversed with them from both these quarters, and he thought if the Government should sanction an expedition such as Lieut. Pim proposed, some endeavour might be made at the same time to form the nucleus of a settlement among them. That excellent body, the Moravians, would be inclined to do anything in their power, in affording interpreters or anything necessary, in order to secure intercourse with the Esquimaux. He was also most anxious to do all that might be necessary with a view to planting a missionary clergyman permanently amongst them. In intellectual power he did not think they came up to the Indians, but they were superior, he thought, in moral qualities. He was sorry he could not give more information respecting these interesting people: all that he knew of them was favourable as regarded their dispositions. He hoped something would be done for them, in a religious point of view, so that the present opportunity might not be lost. Should such be the result of an expedition sent out by Government, he for one would hail it, as conferring a lasting benefit on that neglected and interesting people.

LIEUT. PIM would like to impress upon the Society, especially, the necessity for having a ship at King William Land, because it would be most advantageous to winter close to the Esquimaux, so as to obtain a moral influence over them, and learn from them the precise whereabouts of our countrymen. If, for instance, a travelling party left a ship wintering at Batty Bay, where the 'Prince Albert' wintered, and travelled all the way down, by the time they arrived at King William Land they would be exhausted, and the Esquimaux could easily overpower them if they felt so inclined. At all events, as Captain Maguire said, time was essential to make the Esquimaux divulge all they knew. Sir Edward Parry was a whole winter in the ice (1820), before he obtained any geographical information from the tribes in his vicinity. Therefore he (Lieut. Pim) was anxious that a ship should actually winter at King William Land. Mr. Brown had said it was a very long way round by Behring Strait. All he (Lieut. Pim) could say in reply was, that the longest way round was often the shortest way there. After the vessel arrived at King William Land, by way of Behring Strait, there would still be four weeks' summer before them, to devote to securing the safety of the ship, and explorations in boats; whereas, by the eastern route, there would be only just time to prepare for winter. Captain Collinson in his letter asserted that a ship could go from England to Simpson Strait by the westerly route in ten months. The passage was performed by the 'Investigator' in 1850; and by the 'Enterprise' in 1851, 52, 53, 54. They might therefore take it for granted that the channel was open all the season, and Captain Collinson even went so far as to assert that if Government ordered him, he would take the 'Marlborough,' the largest ship in the service, safely up to Simpson Strait; therefore the Society need not feel any anxiety about the risk the explorers would have to go through. The greatest risk would be with the Esquimaux, and he thought they would be obliged to go among them with caution in endeavouring to ascertain from them all that they knew about Franklin. As regarded the bodies having been washed off a low spit of land, he certainly did not agree with Dr. Rae on that point, because the very liability of the ground to be washed by the rising of the river, must have been observed by Franklin's people, and would have prevented them encamping there, and com-

pelled them to take higher ground. He did not think they could attribute the fact of no vestiges being found to the nature of the ground. He (Lieut. Pim) stated this on his own experience, for having travelled after Dr. Rae's simple and excellent manner, without tents or superfluities of any sort, also after the tentative manner of a Government expedition, as well as making overland journeys, he might be considered a competent judge of causes and effects in the Arctic Regions.

DR. RAE observed that the Esquimaux travelled in sledges and encamped on low ground. He also always pitched on low ground, because the snow was best there for building. The Esquimaux did the same. He had been accustomed to the Esquimaux from Mackenzie River round to York Fort, a small space excepted, and had lived among them with perfect safety. He had left three of his people at Repulse Bay, and on his return he found twelve native families living with them. Some of these were relatives or acquaintances of the men who were supposed to have murdered Franklin's party. They were a gossiping people, not a quiet people like the Indian, and they would have told him at once if any of the party had been alive. If the party had got up the Back River, they would have been perfectly safe, because the native Indians would have fed them and brought them to the Hudson Bay posts. Lieut. Pim said he had travelled in the west, but travelling in the west could give no idea of travelling in the east. He (Dr. Rae) travelled there as the Esquimaux did, and encamped as they generally did in the low flat country. Every one agreed that they would rather encamp on low ground than haul their sledges through the snow to higher ground above the water-line. The party of whites, who starved near the Fish River, had travelled thither on the ice, not by water, because the natives followed the sledge marks on the ice, and the bodies were found before the ice broke up. He had gone over a considerable extent of coast, about 2000 miles, and consequently could speak from his own experience; but he would not venture to express any opinion of what Dr. Kane or Lieut. Pim had experienced 1000 miles or so to the north and west.

SIR RODERICK MURCHISON had no doubt every member of the Geographical Society was aware of the great merits of Dr. Rae's researches; and he was happy to have elicited from the Meeting a very general participation in the views of the gentlemen who signed the requisition to the Government, urging that another search, worthy of the country, ought to be made to discover the remnants of the Franklin expedition. He was also happy to hear that Dr. Rae himself intended to come forward, and he was not surprised at such an offer from so gallant and successful an Arctic traveller.

2. Dr. VOGEL on the Ivory-trade of Central Africa.

Communicated by the EARL of CLARENDON.

THE African ivory which reaches the Mediterranean ports comes chiefly from Adamawa and Alimshé, south of the river Chadda. From Bu-Mauda and Shubbún on the Chadda it passes northward through Jacoba to Kano, whence it is transmitted across the desert by Ghadamsi merchants. The quantity thus obtained is said to be 50 tons annually. Bornu and Wadai also contribute a small supply. Dr. Vogel found the people on the Chadda refusing to supply the usual buyers from the north, as Dr. Baikie's expedition up the Chadda had led them to hope for the arrival of English ships. Dr.

Vogel recommends small trading establishments to be formed at Bu-Mauda and Shubbún. Those markets are in healthy situations, well supplied with all kinds of food, and intercept the trade to the north. Regular periodical communication is essential, as the unexpected arrival of vessels might find the people unprepared to trade, and cause disappointment. A legitimate and active trade would soon spring up in those parts, and be preferred by the natives to dealing in slaves, a traffic which would then be abandoned.*

SIR RODERICK MURCHISON observed that in the early part of the evening allusion was made to the thanks of the Society to Dr. Kane for his expedition—an expedition which was more remarkable than any ever undertaken, inasmuch as it was done at the expense of two individuals of a kindred nation, or, as he might call them, our American brethren. That expedition having terminated, they had expressed their grateful thanks to those excellent Americans, who, in the search for Franklin, had distinguished themselves above all individual Englishmen. No one had acted the part of such pure philanthropists as Messrs. Grinnell and Peabody, both of whom, he was glad to say, were associated on the lists of the Royal Geographical Society.

He was happy to observe present, a gentleman who had taken part in the great survey across the Atlantic, for measuring the depths, and ascertaining the nature of the bottom of the sea, by which that gigantic scheme had been devised, which would unite the two nations in bonds, which he hoped never would be severed. Mr. Cyrus W. Field, the expositor, and in fact the promoter, of this great affair, was in the room, with some of the very materials with which the great connection was to be made. He thought he might call upon Mr. Cyrus Field to give a brief account of the remarkable manner in which the completion of the Atlantic telegraph was to be carried out.

3. *The Atlantic Telegraph.* By CYRUS W. FIELD, Esq., of the United States.

MR. CYRUS W. FIELD said, that the remarks which the Chairman had just made (alluding to some distinguished Americans) to men whom he was proud to call his friends, had struck a chord in his heart. The Americans, their brethren on the other side of the Atlantic, wished to get nearer to their fatherland. They were jealous of the earlier acquired knowledge of the English, and were determined to obtain it. When the Atlantic cable is laid, they will know in New York what is to be done in London, before it is even done there, the difference in time being five hours.

Mr. Field then said, if they would allow him, he would present a profile of the Atlantic Ocean between Newfoundland and Ireland, which was made by order of the United States Government, under the direction of that distinguished man, Lieutenant Maury, of the navy of the United States. The commander of the expedition was Captain Berryman, of the United States steamer 'Arctic.'

* According to the last accounts received by the Society from Dr. Vogel, dated Kuka, December 4, 1855, he intended then to visit Wadai, and afterwards to return to England early in 1857, by way of Adamawa, the Niger, and Fernando Po. Through H. M. Consul at Tripoli full supplies, both of money and articles of merchandise, had been sent to him.

The continuation of Dr. Vogel's important astronomical observations—the first portion of which were published in the 25th Journal of the Society—have not yet arrived.—Ed.

Mr. Field here exhibited the profile of the Atlantic ; and the bed of the ocean was so level throughout the whole course, that, in making the Map, they had to exaggerate the vertical scale so that the depth appeared ten times greater than it actually was in proportion to the distances. The soundings were made according to the weather, not actually at so many miles apart, but as near as they could be made at stated distances. The deepest part was 2½ miles, or 2070 fathoms. This is nearly in the centre. When the plateau was discovered by Lieutenant Maury, he denominated it the "telegraphic plateau." Mr. Field here exhibited a portion of the cable. It was estimated that communications could be transmitted through this cable, with the improved code, at the rate of 30,000 words in 24 hours. The line was completed from New York to St. John's, Newfoundland, a distance of 1710 miles as the line was laid ; and the president of that company had written to say that he had sent a message through it, and had received a reply within 15 minutes.

Mr. Field also exhibited specimens of the bottom of the Atlantic, brought up from over two miles in depth. There were no rocks to injure the cable, for the bottom of the ocean, throughout the whole distance, was composed of minute shells, so small that to the naked eye they appeared like sand, but when examined with a powerful microscope, they were seen to be most perfect in their formation. . This plateau was evidently formed by the great Gulf-stream, which swept the Atlantic coast of the United States, and this being met by the cold currents from the north, the minute marine animals of tropical origin were probably killed, and their shells sunk to the bottom.

In conclusion, Mr. Field said he would only repeat an observation which he had made to a friend, that as on July 4th, 1776, the Americans had declared their independence of Great Britain, before July 4th, 1857, he hoped that they would again be annexed.

Third Meeting, Dec. 8, Session 1856-57.

SIR RODERICK I. MURCHISON, VICE-PRESIDENT, in the Chair.

ELECTIONS.—*The Hon. W. F. Campbell ; Rear-Admiral the Hon. J. Gordon ; Colonel Luke S. O'Connor ; Lord Oranmore ; Sir William Stuart, Bart. ; and Robert Benson, William Benson, Walter Bryant, J. George Cooke, and John Costerton, Esqrs. were elected Fellows.*

The CHAIRMAN read the following letter, addressed to the Secretary, from the brother of their late President, Rear-Admiral F. W. Beechey :—

8, Westbourne Crescent, Dec. 2, 1856.

SIR,—It is my painful duty to record the death of your President, my brother, Rear-Admiral Frederick William Beechey, on the 29th ultimo.

I remain, Sir,
Your obedient servant,

S. VINCENT BEECHEY, M.A.

The Secretary, Geographical Society.

SIR R. MURCHISON next read the following notice on the subject of Admiral Beechey's death :—

GENTLEMEN,—Before we proceed to transact the business of this evening's meeting, it is my painful duty to advert to the great loss we have sustained since we last assembled, by the demise of our excellent and distinguished President.

On the last day of meeting, Admiral Beechey attended in the morning at these apartments, and, feeling himself indisposed, requested me to act for him. On the Saturday afternoon following, alas! he was no more!

It is not in my power to record at this moment (nor is this the fitting occasion) all the deeds and merits of that gallant, good, and eminent man. His conduct throughout a well spent life, will doubtless be done justice to at our next Anniversary, by whomever may then occupy this chair.

Let me however say, in deploring his loss, that, associated as I have been with the Royal Geographical Society since its foundation, it has never fallen to my lot to see it presided over by one who more honestly, efficiently, and successfully devoted himself to the promotion of its interests, than Admiral Beechey.

So strong was the habit implanted in him, of leaving no business unfinished with which he was concerned, that his very last official act within these walls, and when evidently struggling under the disease which carried him off, was to hand over to me his written suggestions respecting the proceedings of the Council and the evening meeting; requesting me at the same time to dwell specially, in any observations from the Chair, on the support which the Society was receiving from Her Majesty's Government, and particularly from the Admiralty.

In truth, I feel convinced that our lamented President accelerated his demise by the indefatigable performance of his public duties, at a time when a fatal disease was overpowering him. Since the sad event, I have heard it indeed from the lips of the Minister of the Crown, under whom he officiated at the Board of Trade, that his conduct in that department was, in all respects, so commendable, that it would be a task of extraordinary difficulty to replace so valuable a public servant.

We here have also tested his value, for we have seen with what good sense, and kind and courteous manners, our late President has kept us united in friendly bonds, and how, under his guidance, the Society has risen to a pitch of prosperity unexampled in its annals.

The following resolution was next proposed by Mr. W. J. Hamilton, seconded by Colonel W. H. Sykes, and unanimously carried :—

“That the Chairman be requested to express the deep sorrow of the Fellows of the Royal Geographical Society on the demise of their distinguished President, Rear-Admiral F. W. Beechey, and to communicate their sincere condolences to his widow and family.”

SIR RODERICK MURCHISON had now to announce from the Chair that it had pleased the Council, seeing the abeyance in which the office of President had fallen, for the first time since the Geographical Society had existed, to ask him to occupy the post. As that motion was passed unanimously, he would not shrink from his duty, provided the proposition met with the concurrence of the Society. But he must remind them that he was no longer what he had been. He was older than his departed friend, and it was not in the nature of things that he should carry out as vigorously and efficiently, as he did formerly, the duties thus imposed upon him. But, such as his powers might be, he could assure them that they would be devoted honestly, and, as far as practicable, exclusively to the interests of the Royal Geographical Society. He must at the same time say that it would be quite impossible for him to con-

tinue these duties beyond the ensuing Anniversary; and if it were the pleasure of the Society that he should occupy the office till that time, he would endeavour to support their interests now, as he had done formerly.

MR. W. J. HAMILTON, F.R.G.S., said, as a member of the Council, having been present when this subject, which was necessarily brought under their consideration, was discussed, he had great pleasure in rising to state that it was the unanimous wish of the Council of the Royal Geographical Society that Sir Roderick Murchison should undertake for the period he had mentioned, the duties which had hitherto been performed by their late lamented President. He begged leave, therefore, to propose that Sir Roderick Murchison do occupy the Chair of the Society until the ensuing Anniversary.

COLONEL SYKES, F.R.G.S., said that, if he had been present at the Meeting of the Council, he should have joined most readily in the proposition now submitted. The Society was under a great obligation to Sir Roderick Murchison for consenting to undertake the office, which was no sinecure, requiring, as it did, no ordinary ability, zeal, or leisure, to be carried out efficiently. He most heartily seconded the proposition.

SIR WALTER C. TREVELYAN, F.R.G.S., observed that, as the worthy Chairman could not put the resolution himself, he begged to do so, and hoped it would be unanimously adopted, "that Sir Roderick Murchison do occupy the office of President until the next Anniversary." The resolution was carried unanimously.

Dr. Livingston.—The Chairman then announced his regret at the non-arrival of their expected guest, the celebrated explorer of Africa, Dr. Livingston, owing to the breaking down of the Peninsular and Oriental steamer, 'Candia,' after leaving Malta. He hoped, however, to have an opportunity very shortly of presenting him to the Society.

Arrival of the Resolute.—The expected arrival of the 'Resolute,' under the command of the American Arctic explorer, Captain Hartstene, as a present to her Majesty from the United States Government, was then announced from the Chair, as having been communicated that day by his Excellency the American Minister, Mr. Dallas.

The papers read were:—

1. *On the Determination of the River "Eulaeus" of the Greek Historians.*
By WILLIAM KENNETT LOFTUS, Esq.

PROFESSOR LONG has remarked that the question as to the site of Susa is inseparable from that of its rivers. General Williams having made certain discoveries in the ruins of Shûsh, near Dizfûl, in Western Persia, in the following year the sum of 500*l.* was voted by Parliament, and, at the request of Colonel Rawlinson, Mr. Loftus undertook the excavations. The remains of two ancient palaces were uncovered. In the Journals of the Royal Geographical Society, the modern Kerkhah is correctly given as the Choaspes, the river of Diz as the Coprales, and the Kurán as the Pasitigris. Professor Long and Mr. Layard believe the Eulaeus to be the Shapûr, but Mr. Loftus considers that there was a bifurcation

of the modern Kerkhah ; one branch of which, passing on the east of Susa, eventually joined the Kurán below Bender-ghil. Thus the name Choaspes properly applied to the *western*, while that of Eulaeus referred to the *eastern* branch ; and the name "Eulaeus" was also given to the united streams and the Pasitigris.

SIR R. MURCHISON remarked that the subject was not new to them—at least, the geographical portion of it—for the volumes of the Society contained references to this river, on the part of Col. Chesney, Lieut. Selby, and others. He—Sir Roderick—had no decided opinion to offer upon a subject which involved so much classical learning ; but he would say that the paper—and this was the highest commendation he could give it—had met with the entire approbation of one of their most able comparative geographers, Col. Leake, and if he and Sir H. Rawlinson had been present, they would no doubt have spoken in the highest terms of its merits.

COL. SYKES, F.R.G.S., asked whether there was any appearance of such a physical alteration of the face of the country as might lead to the belief that the discrepancies, which existed between the present state of the country and the descriptions given of it by the Ancients, could be accounted for by any convulsions of nature, such, for instance, as earthquakes ? In that view of the subject there seemed some value in the study of comparative geography ; because, supposing these discrepancies to exist, we might infer that there must have been some great effort of nature to alter the courses of rivers and the forms of mountains. Thus there would appear to be a relation between comparative geography and geology.

MR. LOFTUS replied that there was no proof of any volcanic action ever having taken place in that region. He had been there four years, and never experienced any shock ; but there had been a change in the course of these rivers. The Tigris and Euphrates had changed their courses continually ; and it was the same with other rivers. The soil is alluvial, and as far up as Bussorah he found tertiary fossils—a species now existing in the Persian Gulf.

In answer to Colonel Sykes—

MR. LOFTUS said that Susa was 300 feet above the level of the sea, and that there are hills at the back ; also that there is a great fall in the river, and that at the lower part it is called "Kurán." Mr. Loftus pointed to the copies of inscriptions from Susa and also to the plans of the palace upon the table.

GENERAL MONTEITH, F.R.G.S., said it was so many years since he made a survey of these rivers, that he must make an apology for offering any observations upon the subject under discussion. Had the Society then existed, a vast deal of information, which was now lost, would certainly have been preserved. He passed from Mohammerah to Ahwaz, and thence to Shuster, taking a survey of the river with the best means in his power, and he was not deficient in instruments. In the neighbourhood of Ahwaz there was a bund, which was drawn across the river, for the purposes of both navigation and irrigation. There was a bed of an apparently large river passing round Ahwaz, which he was informed was the Kurán, turned off in that direction artificially, to enable the natives to build the bund. There was a bridge over it. After the bund was established, the river was again turned into its old channel. This apparent bed of the river was about 100 or 150 yards in breadth, and he was led to suppose that it was the bed of another river. At Shuster there was another bund, which was perhaps the greatest work executed at the present time. He thought there was a mistake in the late survey where a canal had been given for the bed of the river. The canal was crossed by a bridge of thirty-two arches, and

he was requested by the Persian authorities to offer any suggestion he could for the repair of this bund. He could only say that no engineer in Europe or elsewhere could have made a more beautiful work. The bunds were principally intended for irrigation. After leaving Shuster he proceeded to Ram-Hormuz, a distance of 90 miles, where there were signs of the bed of a river that came from the mountains which he crossed. On the other side of the mountains was an immense plain, extending, he might say, to Bagdad, which was crossed by two or three large rivers. But whether there had been any channels cut from these rivers he could not say. A river turned from its course for a short time would soon work for itself a new channel through the light soil of the country. Shuster never could have been a town of any importance; but the ruins of Susa, which he thought had been erroneously denied to be Susa, were 20 miles in circumference. It differed from every city that he had seen, by the streets being laid at perfectly right angles. There was one very large street, leading to the palace, which was an immense mound, little inferior to that of Babylon. In this was the reported tomb of Daniel. It was evidently an artificial mound, and well worthy of being opened; for greater discoveries might be met with in Susa, than in any other part of the world with which he was acquainted.

COLONEL SYKES said that General Monteith had offered a solution of difficulties which had caused a vast deal of discussion. The rivers having been turned from their beds in the shifting soil described, it would be difficult to determine where they had run before.

GENERAL MONTEITH observed that it was 70 miles, by the shortest route, from the river to Ram-Hormuz, across a desert, and it was 90 miles from Susa.

SIR R. MURCHISON stated that, with reference to these Eastern countries, Humboldt had called attention to the changes which had taken place in large rivers within the historical era. The Oxus, the largest of all these rivers, manifestly flowed into the Caspian Sea in the time of Herodotus. There was no doubt that the course of that river had been changed; but he would not pretend to decide, after what had been stated, whether this had been produced by natural causes, as Colonel Sykes suggested, or by the erection of bunds, as General Monteith had remarked. There were gentlemen present who could tell them that large rivers had been changed by the works of the natives.

COLONEL SYKES.—The Indus had apparently changed its course since the time of Alexander.

The PRESIDENT announced that the Secretary would read a short communication from Mr. Henry Poole, who was sent out by the Foreign Office to make a survey in the East for coal. He was not fortunate in finding coal of a good quality, and he was then directed to proceed to the Dead Sea in search of nitre. In searching the Dead Sea Mr. Poole fell in with some other phenomena, a short account of which would be given in the twenty-sixth volume of the Society's Journal :—

2. *Note on the Exploration of the Shores of the Dead Sea.* By MR. HENRY POOLE.

SIR,—As my letter to the Earl of Clarendon, containing a report of my journey in Asia Minor and on the shores of the Dead Sea, has been forwarded by his Lordship to the Society, I take the liberty of expressing a hope that farther inquiries may be made on the shores of the Dead Sea, and I would beg to draw your attention to several points which I consider require verification, viz. :—

1. Can the lebias found at Em Barghek and Ain Terabeh live in the Dead Sea?

2. Are the minnows in the Jordan, mentioned by Lynch, not also lebias?

3. Are the waters of the Dead Sea of different densities, as well as temperatures, at different depths, as well as at different localities?

4. What is the mean dew-point, force of vapour, and relative humidity on the shores of the Dead Sea?

5. What is the mean temperature, as well as amount of radiation?

6. What is the mean height of barometer and boiling-point of water? Lynch gives the latter as 215° .

7. What do the wild-fowl feed upon which dive in the Dead Sea?

8. What causes the phosphorescence observed by Lynch in the Dead Sea?

9. What is the difference of sea-level at different seasons of the year, and will the evaporation compensate for the volume of water flowing into the Dead Sea?

10. I would also call your attention to the close approximation made with the Aneroid Métallique, when corrected by Delcros's formula for temperature and latitude, as shown in the accompanying table of heights of mountains in Westmoreland:—

Names of Mountains.	Heights per Aneroid in feet, by H. Poole.	Col. James, Ordnance Survey.	Difference.
Helvellyn	3056	3117	- 61
Fairfield	2837	2861	- 24
Highstreet	2693	2722	- 29
Wansfell*	1649	1598	+ 51
Kirkstone Pass	1487	1466	+ 21
Ewe Crag, Loughrigg Fell	1123	1101	+ 22

It would thus appear that this very portable instrument may be advantageously employed for topographical surveying by using a proper formula for corrections.

If any further inquiries were made on the shores of the Dead Sea, it would be a good opportunity to carry a series of aneroid levellings through the valley of Acabá to the Red Sea; for in none of the above six heights is there near so much difference as is recorded between the barometrical altitudes of different places in Syria.

I found the temperature of the Dead Sea, in the month of October, about 82° Fahrenheit near the surface. The temperature of air

* I was not quite at the summit of Wansfell, which I assumed to be 30 feet above me, but it may not have been quite so much.

during the day from 90° to 100° , and at night about 80° . By the imperfect mode of wetting the bulb of the thermometer, the dew-point was far below the extreme cases calculated in psychometrical tables. The evaporation was rapid, and the dryness very great, on the shores of the Dead Sea. My aneroid (I had no other barometer) showed a pressure of 31.50 inches and upwards, which is higher than the ordinary barometers are graduated to read.

The small fish which I caught close to the shore of the Dead Sea, in a brine spring flowing into that sea near Usdum Mountain, at a temperature of 90° , and presented to the British Museum, have been named by Sir John Richardson, to whom they were submitted, as "*Lebias*," or *Cyprinodon Hammonis* of Cuvier, and which had been previously found in the Red Sea. He considers it would be of great interest to prove the fact if these fish live in the Dead Sea. At the time when I caught them, I believed them to be the young fry, and not full-grown fish, and therefore I kept all I caught, and never thought of putting any into the Dead Sea to see if they would swim in it. Similar, but larger, fish (about three inches long) were afterwards seen, but not caught, at Ain Terabeh, near the north end of the Dead Sea. The fish called minnows, caught by Lieut. Lynch in the Jordan, may also belong to the same class. If so, may not these fish have come down with the floods of spring, when the waters of the Sea would be less salt, and thus have been able to pass to the south end of the Sea, even supposing that they could not live in it at other periods of the year?

Lieut. Lynch states that the water is at an uniform temperature of 59° at a depth of 10 fathoms, while he found the surface temperature to average 76° . It would therefore be of great interest to obtain the specific gravities, as well as temperatures, of that Sea at different depths.

I observed three different kinds of wild-fowl swimming and diving in the Dead Sea, evidently feeding, and it would be of importance if some could be shot at such a time, so as to examine their crops and see the nature of their food. In theory, it would be as difficult for ducks to dive as fishes to swim in the Dead Sea, and therefore that objection must now fall to the ground.

Lieut. Lynch speaks of a phosphorescent appearance in the Sea, but I did not observe any: if water were obtained at such a time, it should contain animalcules.

The difference in the surface-level of the Dead Sea should also be noted at different seasons of the year.

As I have lately seen the report of some most interesting meteorological observations having been made at a considerable height

at Teneriffe, I have thought if similar observations could be made on the shore of the Dead Sea (which is upwards of 1300 feet below the level of the Mediterranean), they would considerably enlarge the scale of observations; and data could be obtained to that depth for proving or correcting, in a descending scale, the formula respecting radiation, specific gravity, and other subjects of observation recorded by Professor Piazzzi Smyth.

The PRESIDENT called attention to one or two points in the memoir, particularly to the one with respect to the species of fish mentioned—a remarkable little fish, which Mr. Poole had caught in a marshy spot on the shore of the Dead Sea. It had been submitted to Sir John Richardson, whom everybody knew was a high authority on ichthyology, and he had determined that it was a species which existed in the Red Sea, and also in all the fresh waters of Syria. The question of establishing a communication between the Mediterranean and the Red Sea was thus once more brought before them, and this little fish seemed to confirm the theory that there had formerly been a communication.

SIR JOHN RICHARDSON said the fish in question was described by Rüppell, and was known to Cuvier. It was a species of *Cyprinodon*, and was at one time confounded with the carps. He did not know how far the fish would go to prove the theory alluded to by the President. This species, now known as the *Cyprinodon Hammonis*, was first discovered in the oasis of Jupiter Ammon. It exists all over Syria in almost every pool, and Mr. Poole found it on the supposed site of Sodom, close to the Dead Sea, within a few feet of the shore, where the sea at certain times rose. Mr. Poole at first thought it came out of the Dead Sea; but it was found in a marsh fed by a salt spring. He had deposited specimens of the water of that salt spring, and also of the marsh in which he found the fish, in the Museum of Practical Geology; and if that office were to ascertain the specific gravity of these specimens, they might at once determine whether the water of the marsh approached to the Dead Sea in the quantity of salt it contained.* It was a fish which lived both in fresh and salt water, and it was abundantly found in the Red Sea. With respect to the ducks seen by Mr. Poole in the Dead Sea, it did not appear that he had shot any, or he would, probably, have found what they were feeding upon. It was an old notion that birds could not fly over the Dead Sea; but Mr. Poole had shown that they could not only fly over it, but live upon it.

In reply to Colonel Sykes, SIR JOHN RICHARDSON said that the specific gravity of the Dead Sea had been determined; it was about 1·227 to distilled water at 1·000.

* Museum of Practical Geology, Jermyn-street.

Copy of a Note from Dr. Hofmann to Sir Roderick Murchison.

No. 1. Brine spring near Usdum with Fish. Temp.

90° Fahr., Spec. Grav. 1·035.

No. 2. North end of Dead Sea, near Jordan. Temp.

83° Fahr., Spec. Grav. 1·196.

No. 3. Dead Sea, Usdum, South end. Temp. 83°

Fahr., Spec. Grav. 1·204.

No. 4. Peninsula, El Lisan, North end, Spec. Grav.

1·200.

} Mean of Dead Sea at surface, Spec. Grav. 1·200.

According to Lynch—The specific gravity of the Dead Sea, at a temperature of 60° Fahr., and at a depth of 185 fathoms, is 1·2274, and that of the River Jordan is 1·00183.

The PRESIDENT stated that he had received a communication from Mr. Wilson, geologist of the North Australian expedition. A large portion of the letter related to details not absolutely connected with the Physical Geography of the region, but with the arrangements of the expedition. Mr. Wilson had, however, made an exploration of some importance in the neighbourhood, and had sent home a tracing of this part, which might be seen in the map-room. There were moreover some geological details in the communication, and those portions of the paper which related to the geography of the district would be printed in the "Proceedings" of the Society. Owing to the lateness of the hour, he would only direct the title of the paper to be read.

3. *Extracts from Notes on the North Australian Expedition.** By
Mr. J. S. WILSON.

Communicated by Sir RODERICK I. MURCHISON.

Victoria River, July 11, 1856.

DEAR SIR,—As I am to accompany the vessel to Timor, I shall take the opportunity to convey to you a concise account of the North Australian expedition since its arrival at Point Pearce. The horses were landed and encamped at a swamp by Mount Providence, and the sheep were put on board the schooner. Mr. Gregory arranged that himself and brother, accompanied by Dr. Müller, our botanist, and six men, should proceed with the horses round the head of the Fitzmaurice, across the Macadam and Sea Ranges, to Kangaroo Point on the Victoria River, while I was to take charge of the vessel, proceed up the river, and encamp where I should find it most suitable, at or above Kangaroo Point. I was accompanied by Mr. Elsey, surgeon and naturalist; Mr. Baines, artist and store-keeper; Mr. Flood, collector of natural history; and four men. We left Treachery Bay on the 25th of September, and got on well till we came to the shoals in front of the Musquito Flats; and here, through not knowing the passage sufficiently, the vessel grounded at high-water and high spring-tide, and could not be got off. The great danger at this place, in going up the river, results from the singular fact that the tide falls a foot to eighteen inches, while there is still a strong current running upward. This arises from the distance which the tide flows upward, as it does not reach the end of its course before the ebb has commenced at the mouth of the river. A vessel, therefore, going up the river, and grounding on one of these banks, cannot be got off until a higher tide carries her right over the bank. The spring-tides were declining at the time we thus got fixed, and we were within 12 miles of Kangaroo Point, but the river nearly all that distance is choked with sandbanks. There was only one cask of water on board for the sheep and people. I had

* See Proceedings R. G. S., No. I., pp. 5, 10: No. II., pp. 31, 32, 33, 49.—Ed.

already succeeded in finding a creek, with an abundance of water in pools; but we were then 3 miles past the place, and the nearest pool was half a mile from the river-side. I might have sent the sheep there, but my party was too weak to be divided between two camps and the vessel, the latter requiring all the assistance that could be afforded. The allowance of water to the sheep was stopped until more could be obtained, and we had but ten days to have a camp selected and ready to receive Mr. Gregory and party. To meet both these ends, I organized a party to proceed up the river to Steep Head, or such other place where we might find fresh water, and, at the same time, to look out the most convenient place for a camp. We had an India-rubber double boat, composed of four large air-tight bags; these we proposed to fill with fresh-water and tow them down the river. My party included Mr. Elsey, Mr. Baines, and two sailors. With the exception of a spring between Sandy Island and Steep Head, we found no fresh-water until we reached Palm Island, which we did with considerable difficulty, having to haul the boat over the stony shoals at Steep Head. On the evening of the sixth day, we got back to the vessel, and, on the following morning, the water was got on board, amounting to upwards of 500 gallons. On the morning of the 8th of October, I started, with Mr. Elsey and a sailor, in the small boat, to determine the place for our camp. I examined the slope of Sea Range for a distance of about 5 miles in a fruitless search for water, then returned to the boat and proceeded up the river after sundown, and reached a stony spit within a mile of Sandy Island, and stopped there the remainder of the night. In the morning we hurried up to where we had found the springs, dug two wells that promised an abundant supply, filled a small cask, and hurried to get back to the vessel. On our way back, we remembered indications of a large creek running eastward in front of Sea Range, and determined to look into it more particularly as we passed down. As we did so, we were astonished to find a river broad and deep enough to warrant our anticipating its having a long course. Being of a nature to turn Mr. Gregory out of the line he should follow, and delay him on his way to the camp, I ran the boat up its circuitous course till we were 6 miles in a straight line from the entrance; here we were stopped by a flat ledge of rock, over which the water was too shallow to pass with the boat except at high tide. Leaving the man in charge of the boat, we started on foot to trace the river up to a place where it might be supposed the horses would cross, and where they might find fresh water. We effected this at a distance of about 6 or 7 miles, where I marked some trees, and left a notice for Mr. Gregory, informing him

where to find the camp. We then returned with all haste, and reached the schooner by noon on the next day. It was my intention to have sent a boat on the next day, with some of the sheep and a party to encamp at the springs, but the night-tide rose high and carried the vessel nearly over the bank, and there was a prospect of getting her off next tide, to effect which the help of all hands might be required. Having failed in this, I despatched a boat on the morning of the 14th, putting on board twenty sheep and some provisions, and appointing Mr. Elsey, with two men, to take charge of the camp, and Mr. Baines and Mr. Flood to return with the boat for another load. The boat returned on the 16th, and started again on the 17th with eighteen more sheep. Unfortunately they grounded on a bank near the Dome, and being delayed there nearly two days, some of the sheep died. They arrived at the camp, however, a few minutes after Mr. Gregory had been taken across the river to it in the dingy. Meanwhile, as I endeavoured to remove the sheep to the camp, the fate of the vessel became most critical. Being laid across the stream, the current washed away the sand from under both ends, leaving her supported only in the middle. The result was, the keelson, some of the floor-timbers, and two of the beams were broken, and there was every probability of her parting in two had she remained in that position much longer; but when the tide rose we succeeded in getting her shifted a little ahead into the hollow that had been washed out there. We soon after discovered that there were four feet depth of water in the hold, and it required the pumps to be kept at work all the time the tide was up to keep the water below that mark. During the time of low tide some of the principal leaks were found, and temporarily stopped. The spring-tides were increasing, with which we expected to get off. The boat sent to the camp being absent two days beyond the calculated time, much uneasiness was felt in consequence, and another boat was being prepared to send to the camp, when the former appeared with Mr. Gregory on board. Mr. Gregory informed us that his party had gone round by Steep Head to come to the camp. On the 24th of October the vessel was got off, but settled again on another bank near Alligator Point. I was next day sent ashore with the remaining sheep to be kept at water behind the Dome, which Mr. Gregory had found when passing there with the horses; Dr. Müller and two men were sent with me. The vessel was got off, and anchored opposite the camp on the 28th, and on the 30th two boats* arrived to take the sheep and party

* Through the leakiness of one of these boats we lost 11 sheep.

under my charge to the camp. On the day after my arrival at the camp, I was appointed to superintend the arrangement of the stores, and to inspect and coooper the damaged provisions.

After an unsuccessful endeavour to pursue the ascent of the river in boats, on the 24th of November, the Messrs. Gregory, Dr. Müller, and myself, with four riding horses and three with packs, left the camp on a preliminary journey, taking provisions for three weeks. We proceeded along the river to Timber Creek (so called from having found timber there to repair the schooner), and travelled along the creek upward, the course being generally south. The first 7 or 8 miles was through a beautiful valley, principally of a rich alluvial soil, covered with a dense growth of long grass and thinly timbered. The sandstone hills, rising abruptly on each side, were, in many places, picturesque. In the upper part of the valley cherty limestone rocks came to the surface in a broken state, which rendered travelling very difficult for the horses; 18 miles up this creek brought us to a dividing ridge 500 feet above the level of the sea. We were disappointed at not being able to see a range of hills southward. A range to the eastward rose high and distinctly, and seemed to strike toward the river. We travelled eastward, down a creek, until we found water, then struck off, in a N.E. course, along Beagle Valley and parallel with the range, which we supposed to be Fitzroy Range, until we came to the river at Emu Plains. There was abundance of grass, and the greater portion of the soil in the valley was excellent. From the last point we took an easterly course, leaving a range of hills between us and the river, which, however, we struck again after five hours' travelling. The river continued eastward for 7 miles more, and then turned to the S., all the way passing along a narrow valley, enclosed between walls of sandstone, but, after being followed 20 miles southward, it opened into a large plain. Being then on the W. side of the river, we were led off by a branch that came from the S.W. We followed it several miles, and then struck off to a range of hills from which apparently this river came. We ascended a hill at the eastern end of the range. After taking a hasty glance at the country beyond, I took advantage of the opportunity to examine the jasper rock forming the top of the hill. While thus employed, Mr. Gregory drew my attention to the ranges which struck off to the westward, and seemed to enclose the plains at a distance between 20 and 30 miles. I had maintained an opinion that the stream we had lately been tracing, was not the main body of the Victoria. Looking as he now desired me, I said the Victoria was certainly cut off in that direction; but, turning to the eastward, I said it would be found

there yet. Mr. Gregory, however, was doubtful ; he therefore left Jasper Range, with the intention of returning to the camp ; but, as we descended to the lower side of the plains, he took the eastern side of Jasper Creek, and from the top of a little trap hill we could see a long belt of river-trees to the eastward stretching away S. Continuing our course, at little more than a mile from the place where we had left the main channel, we struck it again, broad, deep, and apparently undiminished. We halted there for the night, and on the next morning we followed up the river for nearly 30 miles, in a course a little E. of S., where it divided into two large branches. The rains had already commenced ; there was an abundance of young grass springing up, and we returned to prepare for the journey to the interior. We traced our way back along the river, and arrived at the camp on the 13th of December, after an absence of twenty days.

Mr. Gregory calculating on being five months away, left the camp on the 3rd of January under my charge, taking with him Mr. H. Gregory, Dr. Müller, Mr. Baines, Mr. Flood, four stockmen, and all the horses, amounting to thirty-six.

During Mr. Gregory's absence I ran the boat up Saunders Creek for 6 miles, and went from thence on foot, accompanied by one man, to the east end of Sea Range, which I ascended for the purpose of getting a view of the valley beyond, from which the principal branch of the creek descends, and of the ranges on each side.

On the return of the expedition from the interior, as the preparations for the journey to the Gulf of Carpentaria were likely to occupy a month, I requested Mr. Gregory to permit me to occupy a portion of that time in obtaining a more extended knowledge of the geography and geology of the country east and west from the camp, as my duties in attending to the camp and the schooner had prevented my doing so to the extent I had intended. Accompanied by Messrs. Elsey and Müller, and with provisions for ten days, we took the gig, with two men, down the river to where the schooner lay. Putting some articles wanted at the camp on board the boat, I sent it back, and then, taking the dingy or jolly-boat, we proceeded up the western branch for 22 geographical miles, when further progress was interrupted by a rocky ledge. A sandstone range, exceeding 800 feet in height, ran parallel with the river on the north-west side. A detached hill, about 9 miles distant, being the farthest point of the range visible, I determined to go there and obtain a view of the country beyond. Accordingly, I left my two companions with the boat, and went alone to the hill, to which I gave the name of "Mount Victoria." From this hill I had a view

of the river, 10 miles beyond, which enabled me to lay down its course for a distance of 40 miles, and its probable course full 20 miles farther in the same general direction. I could also see the Newcastle Range, extending unbroken until the view was cut off by a projection of the Murchison Range. I hurried back to my companions, and by walking at intervals during the night, though travelling was very difficult, I reached the boat after twenty hours' absence. We returned to the camp on the 28th of May, having been just ten days away.

The table-land over which Leichhardt passed at the heads of the Roper and South Alligator rivers, I feel satisfied is similar, in every respect, to the table-lands of the Victoria, and is, in fact, the eastern extremity of the same continuous and extensive sandstone formation. He gives an estimate of its elevation in his journal on the 17th of November, when he says, "We stood, with our whole train, on the brink of a deep precipice, of perhaps 1800 feet descent." This I suspect to be a typographical error; what he wrote may have been 800 to 1000 feet, which would correspond very well with the ranges of the Victoria. Capt. Stokes remarks (Vol. II. page 141), that he was forcibly struck with the resemblance between Moresby's Range on the west coast, $28^{\circ} 50' S.$, Sea Range at the Victoria, Cape Flattery on the north-east coast, $15^{\circ} S.$; and he adds Flinders' description of the coast-range at the head of the Australian bight. They exhibit great similarity in elevation, all being between 500 and 700 feet; and I may add my conviction that the table-land of the South Alligator is no more than 800 to 1000 feet, or corresponding to that of the Upper Victoria. Mr. Gregory found it as difficult to descend from Sea Range as Leichhardt did from the ranges of the South Alligator.

On the 21st of June, Mr. Gregory started on his journey to the Albert, taking with him, besides his brother, Dr. Müller, Mr. Elsey, and three stockmen. The schooner was ordered to be taken to Timor, to get a supply of fresh provisions for the ship's people, and, if possible, to leave the sick in hospital before sailing to the Gulf. Mr. Baines is in command of the expedition people on board, and takes with him Mr. Flood, myself, and seven men, with instructions to assist in taking the vessel there.

After Mr. Gregory and party left, ten days were necessary to take the camp-fittings, &c., down the river to the schooner. Finding myself unoccupied for that time, I determined to extend my investigations, and started next morning alone and on foot to go to Duke Mount. Two objects I had in view were, first to discover the source from whence a recent but extensive calcareous formation in

the lower side of the plains was derived; and next, to obtain a more extended view of the plains westward, in both of which I was successful. In approaching Duke Mount, I saw a hill that projected farther into the plains a few miles distant. This hill I ascended, and was then enabled to see the extreme western end of Murchison Range, adding thereby 25 miles to my previous views on that side of the plains. I was also enabled to trace to a considerable extent a branch of the western river which Mr. Baines had seen, but did not follow; I have given the name of "Baines" to that branch, but the river itself I claim as my own discovery, and have named it.

The western end of the Murchison Range terminates in extensive plains. The most prominent hill in front of the range I have named "Mount Victoria;" it is not of itself worthy of such distinction, but the circumstance of my having ascended it on the anniversary of her Majesty's birthday, and obtained my most distant view of a western branch of the river that bears her Majesty's name, induced me so to name it. I enclose the leaf from my note-book on which I drew a sketch of the hill, when about one mile distant on the E. side. The Newcastle Range extends much farther than I have laid it down, and the Ellesmere Range I suppose to join the table-land to the eastward. The river Fitzmaurice most probably has its source in this range.

Arctic Squadron.—CAPTAIN SHERARD OSBORN next informed the Meeting that he had heard a few days since that Captain Penny, who wintered in Northumberland Sound last year, had received information which corroborated the intelligence brought home by Dr. Rae. Whalers generally kept dark the places they wintered in, as it was a question of money, but he knew pretty well where Captain Penny wintered, and he naturally inquired how, at that distance from where Dr. Rae obtained intelligence of the missing ships, he could have acquired his information. It puzzled him very much; the more so as Captain Penny spoke of the wreck of a ship. It struck him, however, that what Captain Penny had heard of, was the wreck of one of our deserted ships. He followed up the evidence as far as he could, and wrote to Captain Cator, R.N., who had commanded a vessel in an Arctic voyage, and who was now the conservator of the Humber at Hull, and consequently well acquainted with the captains of whaling vessels. He sent to him a series of questions, and asked him to procure answers. Through these inquiries he traced out what he believed was a fact—that two more of the abandoned ships had reached the shores of Davis Strait. Captain Penny observed that the Esquimaux had a great deal of ship-wood and treenails. After some trouble he found out that there were two ships near them, and that they were breaking them up and getting the wood out.

The Resolute.—The PRESIDENT next called attention to the fact that in a very short time they might expect the arrival in this country of their old ship the 'Resolute,' as purchased, fitted out, and sent home to us by the American Government. It was very desirable that all parties, who felt as lively an interest as he did in the subject, should testify their deep sense of this act of courtesy on the part of the American Government.

ERRATUM IN No. IV.

At page 97, insert, in the List of Memorialists, the name of *General Ed. Sabine*, which had been *accidentally* omitted.

ERRATUM IN No. V.

At page 173, last line but six, for "*visited*," read "*named*."

PROCEEDINGS
OF
THE ROYAL GEOGRAPHICAL SOCIETY
OF LONDON.

SESSION 1856-7.

Fourth Meeting (Special), Dec. 15, 1856.

The PRESIDENT, Sir RODERICK I. MURCHISON, in the Chair.

In opening the Meeting, the Chairman said,—

GENTLEMEN,—We are now specially assembled to welcome Dr. Livingston, on returning from Southern Africa to his native country after an absence of sixteen years, during which, while endeavouring to spread the blessings of Christianity through lands never before trodden by the foot of a British subject, he has made discoveries of incalculable importance, which have justly won for him, our Victoria or Patron's Medal.

When that honour was conferred in May, 1855, for traversing South Africa from the Cape of Good Hope by Lake Ngami and Linyanti to Loanda on the west coast, the Earl of Ellesmere, then our President, spoke with eloquence of the “scientific precision, with which the unarmed and unassisted English Missionary had left his mark on so many important stations of regions, hitherto blank.”

If for that wonderful journey, Dr. Livingston was justly recompensed with the highest distinction we could bestow, what must be our estimate of his prowess, now that he has re-traversed the vast regions, which he first opened out to our knowledge? Nay, more; that, after reaching his old starting point at Linyanti in the interior, he has followed the Zambesi, or continuation of the Leambye river, to its mouths on the shores of the Indian Ocean, passing through the eastern Portuguese settlements to Quilimane,—thus completing the entire journey across South Africa. In short, it has been calculate that, putting together his various journeys, Dr. Livingston has not travelled over less than eleven thousand miles of African ground.

Then, how does he come back to us? Not merely like the far-roaming and enterprising French missionaries, Huc and Gabet, who, though threading through China with marvellous skill, and contri-

buting much to our knowledge of the habits of the people, have scarcely made any addition to the science of physical geography; but as the pioneer of sound knowledge, who, by astronomical observations, has determined the site of numerous places, hills, rivers, and lakes, nearly all hitherto unknown to us.

In obtaining these results, Dr. Livingston has farther seized upon every opportunity of describing to us the physical features, climatology, and geological structure of the countries he has explored, and has made known their natural productions, including vast breadths of sugar-cane and vine-producing lands. Pointing out many new sources of commerce, as yet unknown to the enterprise of the British merchant, he gives us a clear insight into the language, manners, and habits of numerous tribes, and explains to us the different diseases of the people, demonstrating how their maladies vary with different conditions of physical geography and atmospheric causes.

Let me also say that he has realised, by positive research, that which was necessarily a bare hypothesis, and has proved the interior of Southern Africa to be a plateau traversed by a network of lakes and rivers, the waters of which, deflected in various directions by slight elevations, escape to the eastern and western oceans, by passing through deep rents in the hilly, flanking tracts. He teaches us that these last high grounds, differing essentially from the elevated central region, as well as from the rich alluvial deltas of the coasts, are really salubrious, or, to use his own language, are perfect *sanatoria*.

I have thus alluded, in the briefest manner, to the leading additions to our knowledge, which have been brought before you by Dr. Livingston. The reading of the last letters, addressed to myself, was, by the direction of my lamented predecessor, Admiral Beechey, deferred until the arrival of the great traveller; in order that the just curiosity of my associates might be gratified by having it in their power to interrogate him upon subjects of such deep importance; and, above all, that we might commit no mistakes in hastily constructing maps from immature data; certain sketch maps having been sent to us, before it was possible to calculate his observations and reduce them to order.

Passing then from this meagre outline of the results to science, what must be our feelings as men, when we mark the fidelity with which Dr. Livingston kept his promise to the natives who, having accompanied him to St. Paul de Loando, were reconducted by him from that city to their homes? On this head my predecessors and myself have not failed, whenever an opportunity occurred, to testify our deep respect for such noble conduct. Rare fortitude and virtue

must our Medallist have possessed, when—having struggled at the imminent risk of life through such obstacles, and escaping from the interior, he had been received with true kindness by our old allies the Portuguese at Angola—he nobly resolved to redeem his promise, and retrace his steps to the interior of the vast continent. How much, indeed, must the moral influence of the British name be enhanced throughout Africa, where it has been promulgated that our missionary has thus kept his plighted word to the poor natives who faithfully stood by him!

Turning to Dr. Livingston, the PRESIDENT then said—Dr. Livingston, it is now my pleasing duty to present to you this our Patron's or Victoria Medal, as a testimony of our highest esteem. I rejoice to see on this occasion, such a numerous assemblage of geographers and distinguished persons, and that our Meeting is attended by the Ministers of foreign nations.* Above all, I rejoice to welcome the Representative of that nation whose governors and subjects, in the distant regions of Africa, have treated you as a brother, and without whose aid many of your most important results could not have been achieved. Gladdened must be the hearts of all the geographers present, when they see you attended by men, who accompanied and aided you in your earliest labours. I allude particularly to our own Fellows, Colonel Steele, Mr. Cotton Oswell, and Captain Vardon, who are now with us. As these and other distinguished African travellers are in this room, and among them Dr. Barth, who alone of living men, has reached Timbuctu and returned, may not the Geographical Society be proud of such achievements? I therefore, heartily congratulate you, Sir, on being surrounded by men, who certainly are the best judges of your merits, and I present to you this Medal, as a testimony of the high admiration with which we all regard your great labours.

DR. LIVINGSTON replied :—Sir, I have spoken so little in my own tongue for the last sixteen years, and so much in strange languages, that you must kindly bear with my imperfections in the way of speech-making. I beg to return my warmest thanks for the distinguished honour you have now conferred upon me, and also for the kind and encouraging expressions with which the gift of the Gold Medal has been accompanied. As a Christian missionary, I only did my duty, in attempting to open up part of southern inter-tropical Africa to the sympathy of Christendom; and I am very much gratified by finding in the interest, which you and many others express, a pledge that the true negro family, whose country I traversed, will

* The Ministers of Russia and Sardinia were also present.

yet become a part of the general community of nations. The English Government and the English people, have done more for Central Africa than any other, in the way of suppressing that traffic, which has proved a blight to both commerce and friendly intercourse. May I hope that the path which I have lately opened into the interior, will never be shut; and that in addition to the repression of the slave trade, there will be fresh efforts made for the development of the internal resources of the country? Success in this, and the spread of Christianity, alone will render the present success of our cruisers in repression, complete and permanent. I cannot pretend to a single note of triumph. A man may boast when he is pulling off his armour, but I am just putting mine on; and while feeling deeply grateful for the high opinion you have formed of me, I fear that you have rated me above my deserts, and that my future may not come up to the expectation of the present. Some of the Fellows of your Society—Colonel Steele, Captain Vardon, and Mr. Oswell, for instance—could, either of them, have effected all that I have done. You are thus not in want of capable agents. I am, nevertheless, too thankful now, that they have left it to me to do. I again thank you for the Medal, and hope it will go down in my family as an heirloom worth keeping.

THE RIGHT HON. H. LABOUCHERE, M.P., Her Majesty's Secretary of State for the Colonies, then said,—Sir Roderick Murchison, I thought it a great privilege to be allowed to attend to-night upon your invitation; and certainly with little expectation that I should be called upon to address you on this interesting occasion. I am happy to say, however, that the Resolution which has been put into my hands, and which I have been requested to propose to the Meeting, is one that I am sure will require no arguments of mine to recommend it to your very cordial adoption. You have heard from the President, how the distinguished traveller, who is here to-day to give an account of the achievements which he has performed on the field of Africa, you have heard, how cordially and usefully he was assisted by the Governors of the Portuguese Establishments on the coast of Africa. There is, perhaps, no nation which can boast more than Portugal, of having largely contributed to early geographical enterprise, to our better knowledge of the globe which we inhabit, and to the spread of commerce throughout the earth. I may also say that the mention of the name of Portugal is always agreeable to British ears, because there is no country with which we are united by an older, by a closer, and, I trust, by a more enduring connection. I think it is fortunate and gratifying to us, on the present occasion, that we have the advantage of having among us, the distinguished nobleman who represents Portugal in this country; therefore, we shall be able to convey to the Portuguese authorities, through him, the acknowledgment which, I am sure, we must be all anxious to make on the present occasion. I am too well aware of the value of your time, and of the superior claims that others have upon it, to be desirous of addressing you at any length. Of the importance of the discoveries made in Africa, I am sure we must all feel the strongest and deepest sense; it is, at all events, a matter of liberal curiosity to all men, to obtain a better knowledge of our earth. But there are interests very dear to the people of this country, which are

closely connected with everything that relates to a better knowledge of Africa. There is none, I believe, which has taken a faster hold on the people of Britain than, not only to put a stop to the horrible traffic in slaves, which was once the disgrace of our land as much, if not more than of any other; but also, as far as possible, to repay to Africa the debt which we owe her, by promoting in every manner, with regard to her inhabitants, the interests of civilization and commerce. We must feel how important a better knowledge of the internal resources and of the condition of Africa must be, in all the efforts which Parliament or Statesmen can make in that direction. I will not trespass longer upon your time, but conclude by reading the Resolution which has been placed in my hands, and which is one that I am sure will meet from you, a very cordial reception :—

“That the grateful thanks of the Royal Geographical Society be conveyed, through his Excellency Count de Lavradio, the Minister of the King of Portugal, to His Majesty's Authorities in Africa, for the hospitality and friendly assistance they afforded to Dr. Livingston, in his unparalleled travels from St. Paul de Loanda to Tete and Quilimane, across that continent.”

SIR HENRY RAWLINSON, F.R.G.S., then said—Sir, I could have wished that the task of seconding the Resolution had been confided to abler hands; but since the President has issued his orders—orders which are equivalent to the laws of the Medes and the Persians, with which I am tolerably well acquainted,—I am obliged humbly to bow to the task. After the eloquent description you have heard of the merits of the Portuguese nation, it would ill become me to intrude long upon your time; but I would wish to call your attention to the really great obligations which science is generally under to the Portuguese, especially with regard to the geography of Africa. We are too apt to forget the debt of gratitude which we owe to them for our knowledge of the interior of Africa, almost up to the present time, when Dr. Livingston has completed the chain of their discoveries. We must remember that it was Vasco de Gama, a Portuguese, in the first instance, who doubled the Cape of Good Hope. The Portuguese have established settlements throughout Southern Africa from the earliest times down to the present, and until Dr. Livingston has laid down all his discoveries upon the map, the old Portuguese maps of the interior of Africa, especially the southern portion, are the best available. It is singularly interesting and gratifying to find, that it should be to the Portuguese Governors, that we are indebted for the hospitable reception, which they gave to our distinguished traveller, Dr. Livingston, and which has enabled him to return home in safety, and acquaint us with the results of all his discoveries. As you are about to hear from Dr. Livingston some brief account of his travels, I will not longer trespass on your time, but merely second the Resolution which has been submitted to your notice.

The Resolution having been put from the Chair, was carried unanimously.

The Count de LAVRADIO then rose, and after a brief apology in English for his want of fluency in our language, thus spoke in French :—

M. le Président,—Je ne m'attendais pas à avoir l'honneur de parler devant vous; ce fût donc avec hésitation que je me suis levé, et c'est avec timidité que je vais avoir l'honneur de vous adresser quelques paroles, pour vous ex-

primer ma gratitude de la résolution que vous venez de prendre et de proclamer.

Mon premier devoir est d'adresser mes, aussi sincères que vifs, remerciemens au nom du Souverain que j'ai l'honneur de représenter, et de la nation Portugaise à laquelle j'appartiens, au Right Hon. Mr. Labouchere, non seulement pour la résolution qu'il a proposé à la Société Royale de Géographie d'adopter, mais aussi pour les sentiments d'admiration et d'estime qu'il a si bien exprimé pour la mémoire des intrépides et savants navigateurs Portugais qui, en découvrant des mers et des terres jusqu'alors inconnues, portèrent partout les germes de la civilisation, et rendirent des très grands services aux sciences. A Sir H. Rawlinson, je prie aussi de vouloir bien recevoir mes remerciemens, pour l'aimabilité avec laquelle il a appuyé la proposition de Mr. Labouchere, en rappelant au souvenir de la Société, les importantes découvertes faites par les Portugais ; à vous, M. le Président, pour la bienveillance avec laquelle vous avez soumis à l'approbation de la Société, la proposition de Mr. Labouchere ; et à vous, Messieurs les Membres de la Société Royale de Géographie, pour l'unanimité de votre approbation.

Je vous assure, que je m'empresserai d'avoir l'honneur de transmettre à mon gouvernement, la résolution qui vient d'être prise, et j'en suis sûr il en sera très flatté. Lorsque j'ai appris que le Dr. Livingston allait entreprendre de traverser l'Afrique Méridionale, en allant de la côte occidentale à l'orientale, j'ai écrit à mon gouvernement, en le priant d'expédier les ordres les plus positifs, pour que tous les colonies Portugaises s'en prêtent au Dr. Livingston, toute la protection dont il pourrait avoir besoin, pour poursuivre ses voyages d'une manière sûre et convenable. Je suis donc heureux d'apprendre que les ordres de mon gouvernement furent exécutés.

Maintenant, M. le Président et MM. les Membres de la Société Royale de Géographie, permettez-moi, que je vous remercie en mon propre nom, de l'honneur que vous avez bien voulu me faire en m'invitant à cette séance. En toute occasion, j'aurais été heureux et fort honoré de me trouver parmi l'élite des savans géographes et voyageurs Anglais ; mais aujourd'hui, mon bonheur est encore plus grand, puisque cette séance solennelle est particulièrement destinée à célébrer le retour en Europe du Dr. Livingston, de ce savant courageux, de cet ami de l'humanité, qui, bravant les plus grands dangers, s'exposant à toute sorte de privations, employa les plus belles années de sa vie, à parcourir l'Afrique Centrale dans les seuls buts d'enrichir les sciences, et de propager dans les régions lointaines, la morale évangélique, et avec elle les bienfaits de la véritable civilisation.

Des hommes, tels que le Dr. Livingston, sont, permettez-moi l'expression, des véritables Providences, que le Ciel, dans sa clémence, nous accorde pour nous consoler de tant d'individus inutiles ou méchants qui peuplent une partie de la terre.

Tout le monde sait qu'il y a à peu près quatre siècles et demie, que quelques navigateurs Portugais, aussi courageux qu'instruits, entreprirent et achevèrent des grandes découvertes. Les noms de Zamo, de Prestrillo, des Dias, du grand Vasco de Gama, et de tant d'autres, sont bien connus ; mais tout le monde ne sait pas que, en même temps que ces navigateurs parcouraient les mers, reconnaissaient les côtes, et tâchaient de faire le tour de l'Afrique, pour se rendre en Asie, d'autres tâchaient d'arriver au même but, en traversant l'intérieur de l'Afrique. Avant l'année 1450, par les ordres et avec les instructions du grand et immortel Infante Don Henri de Portugal, le prince le plus savant et le plus grand de son temps, Jean Fernandez pénétra dans l'intérieur de l'Afrique, où, peu de temps après, alla le rejoindre Anton Gonsalves.

Quelques années après, plusieurs autres Portugais pénétrèrent dans l'intérieur de l'Afrique ; quelques uns furent à la recherche de Timbuctu, et d'autres dans diverses autres directions. L'histoire nous a conservé les noms de plu-

sieurs de ces voyageurs, et on peut dire que les Portugais n'ont jamais interrompu leurs tentatives de pénétrer dans l'intérieur de l'Afrique. Vers le fin du siècle dernier, le savant Dr. Lacerda, muni de bons instruments, se proposa de traverser l'Afrique Méridionale, allant de la côte orientale vers l'occidentale. Malheureusement, la mort l'a surpris au milieu de ses savants voyages, dans les états du Roi de Cazembe.

Plus tard d'autres voyageurs entreprirent de traverser l'Afrique, et de 1806 à 1811, Pedro Jean Baptista et Amaro José, avec les instructions du Colonel Francisco Honorato de Castro, allèrent de la côte occidentale à l'orientale, et revinrent à Loando par le même chemin, après une absence de plus de quatre ans. Le journal de leurs voyages a été imprimé. Malheureusement, ils n'étaient pas assez instruits, pour pouvoir déterminer astronomiquement la position des différents lieux, qu'ils ont parcouru.

Messieurs, je m'arrête, et si je cite ces faits et ces noms, ce n'est nullement pour diminuer la gloire qui appartient au Dr. Livingston; bien au contraire, c'est pour reconnaître qu'il a obtenu des résultats, plus complets que ceux qui le précéderent. Le nom du Dr. Livingston est déjà inscrit dans l'histoire de la civilisation de l'Afrique Méridionale, et il y occupera toujours, une place très distinguée.

Honneur donc au savant Dr. Livingston!

M. le Président, et Messieurs, je vous demande pardon d'avoir si long-temps abusé de votre complaisance, et je vous remercie de la bienveillance avec laquelle vous avez daigné m'écouter; mais avant de m'asseoir, permettez encore que je vous prie d'agréer les vœux que je fais pour la prospérité de la Société Royale de Géographie, qui a rendu tant et de si grands services aux sciences, au commerce, et à la civilisation. Agréez aussi les vœux que je fais pour que l'empire Britannique, cette terre d'ordre et de liberté, ce pays où tous les malheurs trouvent un asile sûr et généreux, conserve pour toujours sa puissance. Je fais ces vœux, comme représentant du plus ancien, du plus constant, et du plus fidèle allié de l'Angleterre; je les fais aussi comme simple individu.

The SECRETARY then read extracts from the three last communications, addressed by Dr. Livingston from Africa to Sir Roderick Murchison, which had been reserved for that occasion. They were full of minute and graphic details relating to the regions explored by the traveller, and were listened to with the utmost interest. At their conclusion,

The PRESIDENT said: We return thanks to Dr. Livingston for having communicated these able documents to us, a very small portion of which has been read by Dr. Shaw. It is impossible, on an occasion like the present, fully to estimate the value of Dr. Livingston's communications; but there are so many subjects, some of them of deep interest to persons here assembled, and others of vast importance to the world at large, that I hope Dr. Livingston will explain to us, *viva voce*, some of those remarkable features in his travels, on which he would wish most to dwell. I particularly invite him to indicate to the Meeting, those portions of the country, the produce of which is likely to be rendered accessible to British commerce. I wish him to point out, on the diagram made for this occasion by Mr. Arrowsmith, the lines of those ridges which he describes as perfect *sanatoria* or healthy districts, distinguished from the great humid or marshy region in the interior, and as being equally distinguished from the deltas on the coast, in which the settlements of Europeans have hitherto been made. It is important to observe that large tracts of this country are occupied by *Coal-fields*, of which we have had the first knowledge

from our distinguished traveller. There are indications throughout the flanking ranges, of great disturbance of the strata, by the intrusion of igneous rocks which have very much metamorphosed them. The strata upon the two sides of Africa, dip inwards, and the great interior region thus forms an elevated plateau arranged in basin-shape. This vast basin is occupied by calcareous tufa, the organic remains in which seem to indicate that at a period not remote in the history of the globe, this great marshy region has been desiccated, leaving in these broad plateaus of calcareous tufa, the remains of lacustrine and land animals, which are still living in the country. I hold in my hand a geological map of the Cape territory as prepared by Mr. Bain, which, coupled with the discovery of Lake Ngami, led me to offer to you that speculation on the probable physical condition of the interior of Africa which the observations of Dr. Livingston have confirmed.*

DR. LIVINGSTON then rose, and, pointing to the diagram of Africa, said : The country south of 20° is comparatively arid ; there are few rivers in it, and what water the natives get, is chiefly from wells. ' But north of 20°, we find a totally different country, wonderfully well watered, and very unlike what people imagine Central Africa to be. It is covered by a network of waters, which are faintly put down in the map, and chiefly from native information. The reason why we have trusted to native information in this case, is this : when Mr. Oswell and I went up to the Chobé in 1851, we employed the natives to draw a part of the Zambesi in the centre of the country, which had hitherto been unknown to Europeans. They drew it so well, that although I have since sailed up and down the river several times, and have taken observations all along, I have very little to add to that native map. The natives show on their maps that you can go up one river and get into another. You can go up the Kama, for instance, and get into another, the river of the Banyenko. You can go up the Simāh and get into the Chobé, and can come down into the Zambesi, or Leambye. You can go up the river Teoge, and round again by the Tzō to Lake Ngami. If you go up the Loi, you can get into the Kafue. And they declare that if you go up the Kafue in a canoe, you can get as far as the point where that river divides from the Loangua. All these rivers are deep and large, and never dry up as the South African rivers do. Some will say that the natives always tell you that one river comes out of another. Yes, if you do not understand the language you may say so. I remember when Colonel Steele and I were together, the natives pointed him out as still *wild*, and said I was *tame*, because I understood the language. Now, I suppose, when a geographer tells you that, when the natives say, "one river runs into or out of another," they don't mean what they say ; but, in reality, the natives mean that the geographer is still *wild*, he is not *tame*, i. e. he does not know the language. I found the natives to be very intelligent ; and, in this well watered part, to be of the true Negro family. They all had woolly hair, and a good deal of it, and they are darker than those who live to the south. The most remarkable point I noticed among them, was the high estimation in which they hold the women. Many of the women become chiefs. If you ask a man to do something for you, he will perhaps make some arrangement about payment ; but before deciding to do it, he is sure to say, "Well, I will go home and ask my wife." If the wife agrees to it, he will do what you want ; but if she says no, there is no possibility of getting him to move. The women sit in the public council, and have a voice in the deliberations. Among the Bechuanas the men swear by their fathers, but among the true negroes they swear by their *mothers*. Any exclamation they make is, "Oh, my mother !"—while among the Bechuanas and the Caffres they swear by their father. If a woman separate from her husband, the children all go with the mother—they all stick by

* See President's Address, vol. xxii, p. cxxii, 1852.

the mother. If a young man falls in love with a young woman of another village, he must leave his own village and live with her; and he is obliged to keep his mother-in-law, in firewood. If he goes into her presence, he must go in a decent way, clapping his hands in a supplicatory manner; and if he sits, he must not put out his feet towards her—he must bend his knees back, and sit in a half-bent position. I was so astonished at this, that I could scarcely believe their own statements as to the high estimation in which they held the ladies, until I asked the Portuguese, if they understood the same, as I did. They said, exactly the same; they had been accustomed to the natives for many years, and they say that the women are really held in very great estimation. I believe they deserve it; for the whole way through the centre of the country, we were most kindly treated by them. When I went up the Zambesi, I proceeded as far as the 14th degree, and then returned to Linyanti. I found the country abounding in all the larger game. I know all the country through which Mr. Gordon Cumming and others have hunted, and I never saw anything before like the numbers of game that are to be found along the Zambesi. There are elephants all the way to Tete, in prodigious numbers, and all the other large game, buffaloes, zebras, giraffes, and a great variety of antelopes. There are three new species of antelope that have never been brought to Europe.

Seeing the country was well supplied with game, I thought it was of little use burdening my men with other provisions; I thought I could easily supply our wants with the gun, and I did not wish to tire them and make them desire to return before we had accomplished our journey; so we went with scarcely anything. All the way up the river we had abundance of food, and any one who is anything of a shot, may go out and kill as much in two or three hours, as will serve for three or four days. The animals do not know the gun, and they stand still, at bowshot distance. We got on very well in this way, until we came to Shinté. There we found that the people, having guns, had destroyed all the game in the district, and that there was nothing left, but mice; you see the little boys and girls digging out the mice. I did not try to eat them, but we were there obliged to live entirely upon what the people gave us. We found the women remarkably kind to all of us; the same in going down the Zambesi. Whatever they gave, they always did it most gracefully, very often with an apology for its being so little. Then, when coming to the eastward, we found it just the same. They supplied us liberally with food wherever we went, all the way down, till we came near to the settlements of the Portuguese. In the centre of the country, we found the people generally remarkably civil and kind; but as we came near to the confines of civilization, then they did not improve. We had a good deal of difficulty with different tribes, as they tried to make us pay for leave to pass. It so happened that we had nothing to pay with. They wanted either an ox, a gun, or a man. I told them that my men had just as good a right to give me, as I had to give one of them, because we were in the same position—we were all *free men*. Then they wanted an ox, and we objected to it, saying, "These oxen are our legs, and we cannot travel without them; why should we pay for leave to tread upon the ground of God, our common Father?" They agreed it was not right to ask payment for that, but said it had always been the custom of the slave-traders, when they came in, to give a slave or an ox, and we ought to do the same. But I said, "We are not slave-dealers, we never buy nor sell slaves." "But you may as well give us an ox," they replied, "it will show your friendship; we will give you some of our food, if you give us some of yours." If we gave them an ox, they very often gave us back two or three pounds of our own food: this is the generous way they paid us back. But with the women we never found any difficulty.

Let me mention the punishment which women inflict upon their husbands in some parts. It is the custom of the country for each woman to have her own

garden and her own house. The husband has no garden and no house, and his wives feed him. I have heard a man say, "Why, they will not feed me; they will give me nothing at all." A man may have five wives, and sometimes the wives combine and make a strike against him. When he comes home he goes to Mrs. *One*. She says, "I have nothing for you; you must go to Mrs. *Two*." He then goes to Mrs. *Two*, and she says, "You can go to the one you love best;" and in this way the husband is sent from one to the other, until he gets quite enraged. In the evening I have seen the poor fellow get up in a tree, and in a voice loud enough to be heard by the whole village, cry out, "I thought I had married five wives, but I find I have married five witches; they will not let me have any food." The punishment a woman receives for striking her husband, I thought very odd, the first time I saw it in the town of Sechele. The chief's place is usually in the centre of the town. If a woman happens to forget herself so far as to give her husband a blow, she is brought into the centre of the town, and is obliged to take him on her back and carry him home, amid the jeering and laughter of the people, some of the women crying out, "Give it to him again." Slavery exists in the country, i. e. domestic slavery; but the exportation of slaves is effectually repressed. I found in Angola, that slaves could scarcely be sold at all. I saw boys of 14 years of age, sold for the low sum of 12s. If they could send these to Brazil, they would fetch a very much higher price, perhaps 60 dollars. In passing along, we went in company with some native Portuguese, who were going into the interior, and who had eight slave women with them, and were taking them towards the centre of the country to sell them for ivory. It shows that the trade is turning back towards the interior. In passing through the country, I found that the English name had penetrated a long way in. The English are known as the tribe "*that likes the black man*." The Portuguese, unfortunately, had been fighting with them near Tete; but the natives had been aided by half-breeds, and kept the Portuguese shut up at Tete, two whole years. In coming down the river, I knew nothing of this war. Once we saw great numbers of armed men going along the hills and collecting into a large force, and all the women and children sent out of the way. When we got to where they were, some of the great men came to ask what I was? "Are you a Mozungo?"—that is the name they apply to the Portuguese; I did not know it, however, at that time. "No," I said, "I am a Lekoa." "Then," they said, "they did not know the Lekoa." I showed them my arm. I could not show my face as anything particularly white, but I showed my arm, and said, "Have the Mozungo skin like that?" "No, no; we never saw such white skin." "Have they long hair like mine?"—the Portuguese make a practice of cutting the hair short. "No; you must then be one of the white tribe 'that loves the black man.'" "Yes, I am." I was then in the midst of the belligerents, without having any wish to engage in the quarrel. They finally allowed me to pass. Once when we came to a tribe, one of my head men seemed to have become insane and ran away, and we lost three days seeking for him. This tribe demanded payment for leave to pass, and I gave them a piece of cloth. In order to intimidate us they got up the war dance, and we made them another offer, and gave another piece of cloth. But this was not satisfactory, and then they got up their war dance in full armour, with their guns and drums and everything quite warlike, in the sight of our encampment. My men had been perfectly accustomed to fighting; they were quite veterans, but in appearance they were not near so fine as these well-fed Zambesians. My men said to me, "Will you allow us to keep their wives?" They thought they were intimidating us, but my men were perfectly sure of beating them. One of my chief men seemed to be afraid, because they never make a war dance without intending to attack, and got up during the night and said, "There they are, there they are!" and ran off, and we never saw him again.

The country is full of lions, and the natives believe that the souls of their

chiefs go into the lion, and consequently when they meet a lion they salute and honour it. In travelling, the natives never sleep on the ground; they always make little huts up in the trees. We had a good many difficulties of the nature I have described, with the different tribes on the confines of civilisation. The people in the centre of the country seem totally different from the fringe of population near the coast. Those in the centre are very anxious to have trade. You may understand their anxiety in this respect when I inform you, that the chief of the Makololo furnished me with 27 men and 15 oxen, canoes, and provisions, in order to endeavour to form a path to the West Coast; and on another occasion the same man furnished 110 men, to try and make another path to the East Coast. We had found the country so full of forest, and abounding with so many rivers and so much marsh, that it was impossible to make a path to the west, and so we came back and endeavoured to find one to the east. In going that way, we never carried water a single day. Any one who has travelled in South Africa, knows the difficulty of procuring water, but we were never without water a single day. We slept near water, passed by water several times during the day, and slept near it again. The western route being impracticable for waggons, we came back, and my companions returned to their friends and relatives. I did not require to communicate anything about our journey, or speak even a word about what we had seen; as my men got up in all the meetings which were held, and told the people of what had passed. One of the great stories they told was, "We have been to the end of the world. Our forefathers used to tell us that the world has no end, but we have been to the end of the world. We went marching along, thinking that what the ancients had told us was true, that the world had no end; but all at once the world said to us, 'I am finished; there is no more of me; there is only sea in front.'" All my goods were gone when I got down into the Barotse valley, among the Makololo, and then they supplied me for three months; and in forming the eastern path, which I hope will be the permanent one into the interior of the country, the chief furnished me with twelve oxen for slaughter and abundance of other provisions, without promise or expectation of payment. At one time it was thought, instead of going down the way we came, we should go on the other or south side of the river. But this river forms a line of defence against the Matabele, where my father-in-law, Mr. Moffat, went. I was persuaded by some to go in that direction. But when I had heard the opinions of all who knew the country, and those who had lived in that direction, I resolved to go north-east, and strike the Zambesi there.

In passing up towards Loanda, we saw that the face of the country was different, that it was covered with Cape heaths, rhododendrons, and Alpine roses, showing that we must be on elevated ground. Then we came to a sudden descent of 1000 feet, in which the river Coango seemed to have formed a large valley. I hoped to receive an aneroid barometer from Colonel Steele, but he had gone to the Crimea. In going back, therefore, I began to try the boiling point of water, and I found a gradual elevation from the west coast until we got up to the point, where we saw the Cape heaths and rhododendrons; then, passing down inland, we saw the rivers running towards the centre of the country, and the boiling point of water showed a descent of the surface in that direction too. This elevated ridge is formed of clay slate. In going north-east, towards the Zambesi, we found many rivulets, running back towards the centre of the country. Having gone thither, we found the elevation the same as it was on the western ridge, and the other rivers, as described by the natives, flowing from the sides into the centre, showing that the centre country is a valley—not a valley compared to the sea, but a valley with respect to the lateral ridges. There were no large mountains in that valley; but the mountains outside the valley, although they appeared

high, yet, actually, when tried by the boiling point of water, were not so high as the ridges, and not much higher than the valley.

The PRESIDENT.—Will you describe the White Mountains?

Dr. LIVINGSTON.—They lie to the north-east of the Great Falls. They are masses of white rock somewhat like quartz, and one of them is called "Tabacheu," which means "white mountain." From the description I got of its glistening whiteness, I imagined that it was *snow*; but when I observed the height of the hill, I saw that snow could not lie upon it.

The PRESIDENT.—The Society will observe that this fact has an important application.

Dr. LIVINGSTON.—I observed to them, "What is that stuff upon the top of the hill?" They said it was stone, which was also affirmed to me while I was at Linyanti, and I have obtained pieces of it. Most of the hills have this coping of white quartz-looking rock. Outside the ridges the rocks are composed of mica and mica-slate, and crystalline gneiss at the bottom. Below we have the coalfield, which commences at Zumbo. Higher up there are very large fossil trees, of which I have brought specimens.

The PRESIDENT.—The point to which I called your attention with reference to the white rocks, is important, as it may apply to the mountains towards the eastern coast of Africa, which have been supposed to be covered with snow, and are commonly called the "Mountains of the Moon." It seems that the range of white-capped hills, which Dr. Livingston examined, trended towards those so called mountains, and it may prove that the missionaries, who believe that they saw snowy mountains under the equator, have been deceived by the glittering aspect of the rocks under a tropical sun. I would also ask Dr. Livingston if he has formed any idea of that great interior lake, which is said to be 600 or 700 miles long; and whether the natives gave him any information respecting it?

Dr. LIVINGSTON.—When I was on my way from Linyanti to Loando, I met with an Arab, who was going to return home towards Zanzibar across the southern end of the lake "Tanganyenko," and who informed me that in the country of the Banyassa (Wun' Yassa?) there is an elevated ridge which trends towards the N.N.E. The lake lies west of it, and in the northern part is called Kalague. They cross the southern end of it, and when crossing they punt the canoe the whole way, and go from one island to another, spending three days in crossing. It seems, from the description I got from him, to be a collection of shallow water, exactly like Lake Ngami, which is not deep either, as I have seen men punting their canoes over it. It seems to be the remnant of a large lake, which existed in this part, before the fissure was made to allow the Zambesi to flow out. That part of the country is described by many natives as being exceedingly marshy. The Makoloko went up to the Shuia Lake and found all the country exceedingly marshy, and a large lake seems to be actually in existence, or a large marsh with islands in it. But it can scarcely be so extensive as has been represented, as in that case I must have crossed part of it or heard more of it.

Mr. F. GALTON, F.B.G.S.—I should be glad to ask Dr. Livingston, whether, in his route across Africa, he fell in with any members of the Hottentot race. In old maps the northern limit of the Hottentot race is placed but a short distance beyond the Orange River; later information has greatly advanced their boundary, and, in my own travels, I found what appeared to be an important headquarters of that people, at latitude 18° S. There they were firmly established in the land, and were on intimate terms with their negro neighbours, the Ovampo. These Hottentots asserted that their race was equally numerous still farther to the northward of the most distant point I was able to reach, and I have been unable as yet, to obtain any information by which any northern limit to the extension of the Hottentot race can, with certainty, be laid down.

DR. LIVINGSTON.—When I went up to discover Lake Ngami with Mr. Oswell, I found people who have the “click” in their language, and who seem to be Hottentots; they had formerly large quantities of cattle, and intermarry with the Bushmen. Again, two Portuguese of Loanda described to me a people in 12° S. as Bushmen, but I did not see them.

MR. GALTON.—I might mention in corroboration of Dr. Livingston's report of a gradual desiccation of the Bechuana country, that the Damaras entertain a precisely similar belief. They say that within the existing generation, their country has become dried up to a marked extent; hence, without doubt, this same physical phenomenon affects the entire breadth of Southern Africa.

DR. LIVINGSTON.—You not only see remains of ancient rivers all through the country, but you find actually the remains of fountains; you see holes made in the solid rock, where the water has fallen, when flowing out of these fountains, and you find in the sides of some of the holes, pieces of calcareous tufa, that have been deposited from the flowing of the water.

PROFESSOR OWEN: I have listened with very intense interest to the sketches of those magnificent scenes of animal life, that my old and most esteemed friend, Dr. Livingston, has given us. It recalls to my mind the conversation I had the pleasure to enjoy with him in the Museum of the College of Surgeons, seventeen years ago. I must say, that the instalment which he has given us of his observations on animal life this evening, more than fulfils the highest expectations that I indulged of the fruit that science would receive from his intended expedition. It has, so far, exceeded all our expectations; but it is not only in reference to those magnificent pictures of mammalian life,—that reference is to those new forms of that peculiar family of ruminants, the antelopes; but it is to those indications of the evidence of extinct forms of animal life which interest me still more. I hope some fragments will yet come to us of those accumulated petrified remains of animals, which it has been Dr. Livingston's good fortune, among many very wonderful and unique opportunities of observing nature, to have seen.

MR. J. MACQUEEN, F.R.G.S., observed—Lacerda does not give either the longitude or the latitude of Tété. He gives the latitude of Maxenga to the north of Tété, 15° 19' s., the estimated distance to which from Tété, according to the rate of time in travelling, places Tété, by my calculation, in 16° 20' s. lat. Dr. Lacerda gives the latitude of the Isle of Mozambique, at the western entrance of the Lupala, 16° 31' s. Dr. Livingston gives it 16° 34', a concordance which proves the accuracy of both. Dr. Lacerda's accuracy, thus established, is of great importance, because he gives us two important astronomical observations far to the northward. The first, at Mazavamba, 12° 33' s. lat., and 32° 18' e. long., and 20 miles south of the Arroanga of the north, 260 miles from Tété, which is the same river as that designated the Loangua by Dr. Livingston, at its junction with the Zambesi. The second observation was made at Muiri Achinto, now called Chama, lat. 10° 20' s., and long. 30° 2' e., from which point Gamitto's daily bearings and distances enable us to fix the capital of Cazembe with sufficient accuracy. Westward of Mazavamba, about 60 miles, is the great mountainous chain of Maxinga, or Muchinga, rising from 16,000 to 17,000 feet above the level of the sea. A branch of it runs n.e., another to the westward, and a third to the s.s.w., by the Zumbo, stretching southward to the mountains of Chidam and those called Mushome.

The accounts of the Embarah are fully substantiated by Brocheda and the journeys of Ladislaus. Embarah is the Aimbara, or the chief tribe and ruler of the great province of Quanhama, situated to the westward of the great river Cubango. This river rises in Nanno, near the sources of the Cunene, but instead of joining that river, as hitherto supposed, it pursues its way on the westward of Bihé to the s.e., and joins the Leambye, and is doubtless the parent stream of the Chobé. This may give a great water communication from

the western portion of Bihé to the Indian Ocean, which is important. The land to the east of Bihé is very high. It is, properly speaking, the Libalé. In July and August, the hills are reported to be covered with snow, and the lakes and rivers to be completely frozen over. This degree of cold so near the equator (14° to 15° s. lat.) gives a very high elevation. Ladislaus in his southern journey penetrated to $20^{\circ} 5'$ s. lat., and $22^{\circ} 43'$ e. long., at which point he must have been at one time only about three days' journey distant from the point where Dr. Livingston was at that time, and who was probably the white man of a party described as riding on an ox. Ladislaus has also penetrated northwards and north eastwards around the Cassaby to $4^{\circ} 41'$ s. lat., and $25^{\circ} 43'$ e. long.

It affords me great pleasure to see Dr. Livingston among us. I have closely followed his journeys since I heard of him on the top of the volcanic Bakkaluka hills riding on the ox, convinced that he would soon send us most important information. Dr. Livingston has travelled more in Africa than any other traveller ancient or modern, while he has laid down with geographic accuracy every point over which he travelled from sea to sea—the Atlantic to the Indian Ocean.

CAPTAIN VARDON, F.R.G.S.—I beg to supply an omission which my friend, Dr. Livingston, has made this evening. He has expatiated at great length on the amiability of the African ladies; but there is one lady whom I met in South Africa, and from whom, I believe, many South African travellers, whom I see in this room, experienced the greatest kindness and hospitality. Dr. Livingston has not made any allusion to her, and I rise to do so. This lady, I need scarcely say, is his own wife. I observe here Colonel Steele, Mr. Oswell, Mr. Gordon Cumming, and others, who will bear me out in saying that we received the greatest kindness from Dr. and Mrs. Livingston; their hospitality was unbounded, and I am glad of having this opportunity of publicly thanking them before the Royal Geographical Society. Dr. Livingston has said, with his usual modesty, that he has not done much, that any of us might have done as much. I beg to differ from him. As to my own small excursion on the Limpopo, after what I have heard to-day, I feel so ashamed of myself, that I fancy I have only just returned from Blackheath.

COLONEL STEELE, F.R.G.S.—My travels in South Africa were much like Captain Vardon's. Dr. Livingston was my earliest companion in Africa, but we travelled such a short distance in company, that I am afraid any remarks I could offer, beyond again returning my best thanks to Dr. and Mrs. Livingston for their hospitality, would be of no importance to the Society.

THE PRESIDENT.—Colonel Steele's modesty has prevented him from stating that without the instruments with which he had provided Dr. Livingston, he could not have made the excellent observations which have been obtained.

MR. GORDON CUMMING begged to confirm what Captain Vardon had said with respect to the kindness with which Dr. Livingston received all parties who visited him. He was not aware that Dr. Livingston had alluded to the insect (the tsetse) whose bite is fatal to cattle. One year, while hunting in the mountains, he, Mr. Cumming, lost all his horses and oxen from the bites of this fly, and if it had not been for the kindness of Dr. Livingston in at once sending him his own cattle, he would scarcely have been able to have extricated himself from his dilemma and returned to Europe.

MR. J. CRAWFORD, F.R.G.S.—Perhaps Dr. Livingston will have the goodness to give us some notion of the state of society among these people, especially among the tribes that inhabit the plateau valley. That ought to be a place in which there is a considerable civilization with a decent form of government. They seem to have many advantages, an excellent climate, excellent soil, and an excellent supply of water. What is the state of the arts among those people? Do they understand the art of making malleable iron or steel? Do

they know the use of any other metal, or the use of alloys, as those of copper? Can they weave, or make bread? What plants do they cultivate? And what are they likely to produce in exchange for our merchandise? I strongly suspect, from what Dr. Livingston has said respecting the women, that the great portion of the labour, even of the field, is left to them, and is not performed by the men, otherwise how could the women be able to feed the men? They must work in order to procure that with which the men are fed. I expect the men are idle and the women laborious. Some men would appear to have as many as five wives. How come they to monopolise so many?

Dr. LIVINGSTON said : The new articles of commerce that I observed are chiefly fibrous substances, some of them excessively strong, and like flax. They abound in great quantities on the north bank of the Zambesi. There are also great quantities of a tree, the bark of the root of which is used by the Portuguese and natives as the Cinchona. It has been employed in fever by the aborigines of the country from time immemorial, and both the Portuguese and my companions and myself found it very efficacious. It is remarkable that where the fever most prevails, there the tree, which I believe to be a cinchona, abounds. It seems the remedy is provided for the disease, where it prevails most. Now, in connection with the opening up of this river and the fever, I have seen on the banks of the Zambesi whole forests of this Cinchonaceous tree, particularly near Senna. A decoction of the bark of the root has been found to act exactly as quinine : it is excessively bitter, and may prove a good substitute. There is also Calumba root, which the Americans purchase, to be used as a dye, and it is found in large quantities. A species of Sarsaparilla is to be found throughout the whole country. The sugar-cane grows abundantly, but the natives have no idea of sugar, although they have cultivated the cane from time immemorial. The chief of the Makololo sent about thirty elephant tusks down to the coast, and gave me a long list of articles, which I was to buy for him in the white man's country. As I had been entirely supported by him for several months, I thought it my duty to accept his commission, and I intend to obtain these articles for him. Among other things he ordered a sugar-mill. When he found that we could produce sugar from the cane, he said, "If you bring the thing that makes sugar, then I will plant plenty of cane, and be glad." Then, again, indigo grows all over the country in abundance. The town of Tete has acres of it ; in fact, it is quite a weed, and seems to be like that which grows in India, for before the slave trade became so brisk indigo was exported from Tete. The country also produces the leaves of senna, and, as far as I could ascertain, exactly like that which we import from Egypt. There is plenty of beeswax through the whole country ; and we were everywhere invited by the honey-bird to come to the hives. Any one who has travelled in Africa knows the call of the honey-bird. It invites travellers to come and enjoy the honey, and if you follow it, you are sure to be led to the honey. Some natives have given it a bad character. Sometimes, when a man follows the bird, he comes in contact with a lion or a serpent, and he says, "It is a false bird, it has brought me to the lion." But if he had gone beyond the lion, he would have come to the honey. The natives eat the honey and throw the wax away. In Angola it is different. There, a large trade in wax is carried on, and the bees are not so numerous as in the eastern parts of the country ; but here they have no market. It was the same with ivory when Lake Ngami was discovered. They will not throw away an ounce of it now. Then, again, there are different metals found. There is a very fine kind of iron ore ; and at Cazembe there is much malachite, from which the natives extract copper. Then there is gold round about the coal-field, and gold has been procured by washing from time immemorial. In former times the Portuguese went to different places for gold with large

numbers of slaves. It was before the time of the great exportation of slaves began. The chiefs had no objection to their washing for gold, provided they gave a small present first. Then there is coal near Tété; no fewer than eleven seams exist, one of which I found to be 58 inches in diameter. The coal has been lifted up by volcanic action. There is also a hot spring there. The thermometer stands at 160°. The coal from two of these seams could be easily exported, as they are situated on a small river, about two miles below Tété, and the coal could with very little trouble be brought down. When you go up the Luabo, or largest branch, the river is rather narrow, but as you ascend it gets much broader. The Mutu is another river that joins the Zambesi. At the point of junction of the Mutu or Quilimane river with the Zambesi, the beginning of the Delta, that river is three-quarters of a mile broad. When I passed down to that point it was a deep, large river, as it was then full. The Portuguese tell me there is always a large body of water in the river, during certain months in the year. This great body of water, spread over a large space, is in the dry season shallow, except in the channel, which is rather winding. At some seasons the channel changes its course. There are many reedy islands in it, and these are sometimes washed away. During five months of the year there is plenty of water for navigation, and during the whole year there is water enough for canoes. A vessel of light draught like the Portuguese launches, could go up to about 20 miles beyond Tété with the greatest ease, during those months. At Kebrabassa in Chicova, there are rapids, caused by certain rocks jutting out of the stream. I did not see them, as we were obliged in our descent to leave the river, on account of the rivulets being filled by the large river coming into flood, and to pass down by land all the way from the hill Pinkue to Vunga, and thence to Tété. There is another rapid called Kansala. Beyond that the river is smooth again, until you come to the "Great Falls of Victoria," where it would be quite impossible for any one to go up, as it is a deep fissure or cleft.

MR. CONSUL BRAND, F.R.G.S.—I am unwilling to be altogether silent on the present interesting occasion, having resided a good many years in that part of the West Coast of Africa which Dr. Livingston visited, and where our Associate Mr. E. Gabriel still resides. I had been obliged by ill health to leave the country shortly before Dr. Livingston's arrival; but the Doctor could not have fallen into better hands than into those of Mr. Gabriel. It was from a letter addressed by Mr. Gabriel to Lord Ellesmere, that this Society first heard of Dr. Livingston's arrival at Cassange. Mr. Gabriel immediately sent an invitation to the Doctor to take up his abode with him, during his stay at Loanda, and at his house the Doctor and his faithful companions found a home. The Doctor's first Report from Loanda to the London Missionary Society, was written at his sick-bed by Mr. Gabriel's own hand. He accompanied the Doctor part of the way on his return journey through Angola, and from that time up to the present, I have been in the habit of receiving from him letters manifesting the deepest interest in the Doctor's progress in the interior of Africa. I wish to mention these facts in justice to Mr. Gabriel, because on my arrival the other day in England, I received a letter from him simultaneously with Dr. Livingston's arrival, in which he expresses the utmost anxiety for the Doctor's safety. I have written, and a letter is now on its way to Loanda, announcing the Doctor's safe arrival among us. But it is not only to Mr. Gabriel that I would allude; for when Dr. Livingston arrived at Loanda, I was delighted to hear how he had been received by the Portuguese. I resided nearly nine years among this people, and I can testify that I never received greater acts of kindness from any other nation, than from them. I had among them some of my best friends, whose friendship was unequivocally tested under trials and in sickness, and I was delighted to hear that the same kindness which I had experienced at their hands had been experienced by Dr. Livingston. I am glad to have this opportunity of testifying,

in the presence of the Portuguese Minister, my gratitude for the kindness I received from his countrymen during my residence in the Province of Angola.

But the consequences resulting from Dr. Livingston's journey, are calculated to contribute so much to the interests of the Portuguese African Colonies, that I am sure in time, they will be more than repaid for the kindness they showed him. Dr. Livingston's arrival at Angola I look upon, as one of those opportune events, which sometimes have an important influence on the destinies of a country; at no period could such a visit have been more fortunate. The minds of men were unsettled in consequence of the depressed condition of the peculiar traffic which had so long been paramount, and the attention of thinking persons was turned to legitimate trade and the development of the resources of the country. Farther, the Portuguese Government had passed a measure for registering and gradually emancipating the slaves in their colonies. Those who take an interest in the progress of the African race will be glad to hear of this fact.

Dr. Livingston arrived about this time, and showed that by opening up a communication with the interior of Africa, a rich trade might be carried on, that would more than compensate for the loss the colony was likely to sustain from the abolition of the slave trade. The Doctor prophesied that, very soon after his journey had become generally known, an attempt would be made on the part of the tribes in the interior, to communicate with the coast. This prophecy has been fulfilled; for I learn from a communication from Mr. Gabriel that a caravan of negroes, fitted out by Sekeletu and led by one of the Arabs, who crossed from the coast of Zanzibar to Benguela in 1851, had arrived at Loando by way of Bihé. This expedition has not, it would seem, been very profitable, owing to causes incident, I should hope, only to first attempts; but I trust that experience will render the next more successful. I shall not, at this late hour, read Mr. Gabriel's very interesting communication, but limit myself to stating the fact it announces, which proves that the inland tribes are anxious to open up a communication with the coast, and shows how correctly Dr. Livingston calculated the result.

I wish to mention another result of Dr. Livingston's visit. At Loanda we had but one small newspaper; the Doctor wrote a series of articles for it, which appears to have stimulated a literary tribe, and you here see the 'Loando Aurora, a Literary Journal,' printed at the Government press, and, I believe, one of the fruits of Dr. Livingston's visit to that city.

The PRESIDENT.—I have now only to congratulate the Meeting upon having received so much instruction from Dr. Livingston. I may well say he has communicated to us the outlines of a book, which I hope will soon be published for the information of the British public. I am glad to add that there is no person fuller of gratitude to the Portuguese than Dr. Livingston himself. If he has not here expatiated upon that subject, I can testify that in private letters which he has addressed to me, he has uniformly dwelt upon the very kind and liberal conduct of the Portuguese Authorities, officers, and people to himself and party. He was also most kindly received by General Hay, commanding Her Majesty's forces in the Mauritius, and restored to health by the hospitality of our countryman.

The Resolute.—The PRESIDENT finally announced to the Meeting that, at the request of the Council, he had invited Captain Hartstene and the American officers of the 'Resolute' to dine with the Society prior to their departure from this country. The day had not been appointed as yet, as Captain Hartstene had been suddenly called to his ship—Her Majesty the Queen, having signified her intention to visit the 'Resolute' on the next day.

Fifth Meeting, Jan. 12, 1857.

SIR RODERICK I. MURCHISON, PRESIDENT, in the Chair.

PRESENTATIONS.—*Colonel Smyth O'Connor, John Palliser and J. D. Crum Ewing, Esqrs., were officially introduced upon their election.*

ELECTIONS.—*Captain G. H. Richards, R.N.; Captain D. J. Herd; Lieutenant Fairholme, R.N.; Clarence Braddyll; James Crawford; E. Auchmuty Glover; Charles L. Gruneisen; Edw. Terrick Hamilton; Francis Nares; George Nelthropp; Henry Nesbitt; William Peters; W. G. Smith; John M. Teesdale; and Henry Tudor, Esqrs., were elected Fellows.*

DONATIONS.—Among the more important donations presented to the Society since the last meeting, were 'The Atlas of the Government of Tver,' executed under the superintendence of General Major Mendt, and presented by the Imperial Geographical Society of St. Petersburg; Papers containing historical and other information relative to ports and places in and about the Persian Gulf, presented by the East India Company; the 'Red River of Louisiana,' by Lieut. Marcy, U.S. Navy; Sitgreave's 'Expedition to the Zuni and Colorado Rivers,' presented by General Mercer; 'Supplement to Dr. Blackie's Imperial Dictionary;' the Transactions of various Societies, &c.; Stanford's Maps of London, with New Postal Sub-Divisions, &c.

The Livingston Testimonial-Fund Papers were laid on the table.

ANNOUNCEMENTS.—The PRESIDENT said, with reference to the dinner offered to Captain Hartstene and the American officers who brought home the 'Resolute,' if it had been possible for those gentlemen to have accepted the invitation, he had every reason to believe, from the spirit shown by the Fellows of the Geographical Society and their numerous friends, that it would have been one of the most effective and numerous attended meetings, ever given in the Metropolis by any Scientific Body. He regretted that it did not comport with the arrangements of Captain Hartstene and his brother officers, who had expressed themselves quite overcome by English hospitalities, to accept the invitation which emanated from the Geographical Society.

Capt. Hartstene.—After the ballot had been taken, the PRESIDENT said, he held in his hand twenty-seven proposals for the admission of Candidates into the Society. It was a remarkable event; one which had scarcely occurred in any Scientific Society in the metropolis. The first on the list was an Honorary member; and he was sure the members would agree with him that the Council had done

right in proposing that Captain Hartstene, of the United States Navy, should be an Honorary member.

The papers read were—

1. *Proposed Exploration of the River Orinoco, &c.* By Rear-Admiral Sir CHARLES ELLIOT, late Governor of Trinidad.

Communicated by Sir RODERICK I. MURCHISON.

AN officer administering the government of a British colony, situated within a few hours' steaming of the mouth of the Orinoco, would naturally recur with interest to Humboldt's account of his explorations in that river, of its intersection with the majestic Amazon, by the confluence of the waters of the Cassiaquare and the Rio Negro, a great affluent of the Amazon, and of the still shorter means of connecting these two stupendous river systems, comprising, according to that great authority, a surface of 190,000 square leagues, by the easy opening of a canal of 7 or 8 miles long, at the Isthmus of Tuamini, situated between the headwaters of the river of that name, falling into the Orinoco, and the Rio Negro into the Amazon. In that voyage of 75 days and 1500 miles, in a pirogue of scarcely three feet breadth, which had its commencement at San Fernando on the Apure, and closed at Angostura on the lower Orinoco, Humboldt and Bonpland collected not merely a body of scientific observations, which in point of amount, variety, and value, have never been exceeded by any travellers, but Humboldt enriched the narration with reflections and indications of unsurpassable practical importance.

No investigations could be more worthy of the reputation of this great country, or more conducive to its vast commercial interests, than those to which Humboldt has called attention in that part of his narrative, in which he describes his voyage, setting out at San Fernando on the Apure, to its confluence with the Orinoco; up that stream, from that point, as high as San Fernando de Atabapo, across the short portage from the Tuamini to the Rio Negro, occupying four days—journeying in the forest; down that noble affluent of the Amazon to the Brazilian frontier at St. Carlos; thence retracing their course to San Fernando de Atabapo by the way of the Cassiaquare and Orinoco, thus establishing the connection of these two great river basins:—

“Depuis que j'ai quitté les bords de l'Orinoque et de l'Amazon,” says Humboldt, writing in 1812 or 1813, “une nouvelle ère se prépare pour l'état social des peuples de l'Occident. Au fureur de dissensions civiles succéderont les bienfaits de la paix, un développement plus libre des arts industriels. Cette bifurcation de l'Orinoque, cette isthme de Tuamini si facile à franchir

par un canal artificiel, fixeront les yeux de l'Europe commerciale. Le Cassiaquare, large comme le Rhin, et dont le cours a 180 milles de long, ne formera plus en vain un ligne navigable entre deux bassins des rivières qui ont une surface de 190,000 lieues carrées. Les grains de la Nouvelle Grenade seront portés aux bords de Rio Negro; des sources de Napo, et de l'Ucaylé, des Andes de Quito, et du Haute Péru, on descendra en bateau aux bouches de l'Orinoque, sur une distance qui égale celle de Timbuctu à Marseilles; un pays neuf, à dix fois plus grand que l'Espagne, et enrichi des productions les plus variées, navigable dans tous les sens par l'intermède du canal naturel du Cassiaquare, et du bifurcation des rivières. Un phénomène, qui sera un jour si important pour les relations politiques des peuples, mérite, sans doute, d'être examiné avec soin."

In the Atlas accompanying the narrative, published by Humboldt at Paris in 1814, he gives a map of the course of the Apure, from its headwaters to its confluence with the Orinoco, and it is impossible to peruse his account of the countries, and the rich and varied products attainable through that line of navigation, without recognizing the force of his reiterated notice of the prospective value of that stream of trade and intercourse. But he presses still more urgently on the importance of the navigation of the Meta, which he compares with the Danube not in length, but in volume of water; and he also furnishes a map of this river in the Atlas. He describes it to have a navigation of at least 400 miles from its confluence with the Orinoco to its connection with the streams which descend from the table-lands of Santa Fé de Bogotá, and all the richest regions of New Grenada. From the Embarcadero on the river San Juan, falling into the Meta, the distance to Bogotá by the valleys of Apiay and Caqueza does not exceed 10 leagues. In point of shortness of land-travel, between navigation and the tableland and all other conveniences of trade, there seems reason to think that the route to Bogotá by the Meta would soon displace that by the Magdalena, the basin of which is comparatively of very inferior importance.

When the Orinoco and its affluents, especially the Meta, are well opened up by steam navigation, it is in the highest degree probable that Humboldt's view respecting the wheat supply of the continental shores and the islands of the Caribbean Sea will prove to be correct. They will easily draw that supply from Cundinamarca and the rich tablelands of New Grenada. Indeed, in years of comparative scarcity in Europe and the northern parts of America, these great streams may be freighted with heavy supplies of corn destined for these shores, and for those of the United States of America. In those surprisingly fertile soils and genial climates, men reap at the seasons when we sow, taking off two crops annually, of weight per acre almost, if not quite equal, to the best cornlands of Europe;

returns, it should be said, to cultivation, which would hardly deserve the name in this country.

Nothing can be more certain, than that judicious steam navigation on the Orinoco and its affluents, would soon show steadily increasing returns to capital. The regions drained by that system are incalculably rich in vegetable and mineral resources. The lower lands teem with tropical products and cattle; the valleys of the mountainous districts, and the table-lands, have the climate of temperate regions with the vigour of a tropical sun, and a soil of surpassing fertility. I asked Mr. Clay, many years since, in a voyage which we made together on the Mississippi, what he thought it would be reasonable to compute steam navigation had done in accelerating the settlement of that basin. He replied that he had often reflected on that subject, and he considered it scarcely an exaggeration to say that if it had pleased God to create those vast regions with all their present productive powers, but with no great watercourses rolling through them until many hundred years after they had been partially inhabited, the consequences could hardly have been more wonderful than those which had followed within his own short scope of observation, since the first establishment of steam navigation on the Mississippi and its affluents. But what is the basin of the Mississippi and its affluents, to the united basins of the Orinoco and the Amazon? Insignificant indeed, in every respect of area, and variety and value of natural resource.

It has often occurred to me, during my residence at Trinidad, that when the enthusiastic and heroic Raleigh sought, or feigned to seek, his El Dorado up the Orinoco, it could hardly have failed to strike that brilliant imagination, that he was upon the track of an El Dorado of far deeper significance, and more inexhaustible streams of wealth, in the truest sense of that word, than those mountains of gold, and cities and palaces paved with precious stones. The realisation of all the promise of that wondrous tale, would be poor indeed in comparison with the results of those grand and wise plans of Humboldt, founded, not upon impulses of cupidity, or visions of conquest, but on the sober deductions of exact knowledge, and the sure consequences to flow from the dissemination of the arts of peace, of commerce, and the endless train of civilization and improvement. "Rivers," says Pascal, "are roads that run, and lead us where we will;" and when we consider that this amazing network of waterpaths, longer by thousands of miles than the circumference of the globe, has its nearest exit to the shores of Europe, almost within sight of a British possession, it is certainly an abashing reflection that more has not been done to avail ourselves of these

advantages. Speaking as a professional man and with some experience of the spirit and purpose of a great maritime rival, I am persuaded it is a sound opinion, that the Government of this Empire cannot too constantly encourage the enterprise of travel in outlying regions, and most especially waterborne travel. A former President of the United States is reported to have said with more roughness than reverence, that if there were a bag of coffee in the mouth of an unmentionable place, there would be found a countryman of his to go and trade for it. It would not be recommendable to follow any leading to that destination for coffee or any other commodity; but in all rational and honourable maritime undertaking on the face of this planet in the pursuit of knowledge, it is a matter of high policy that this nation should lead, and strive to pass beyond the rest of mankind. Most honourable is it to the successive Boards of Admiralty, since the close of the long war, that we have done so both in the Arctic and Antarctic, for assuredly we had better have lost ten sail of the line in battle, than that any other nation should have vanquished us in those perilous investigations. Their priceless result has been the maintenance of the spirit and genius of the Navy.

The practical preliminary step which has suggested itself to me, is that Her Majesty's Government should be led to move the Governments of New Grenada and Venezuela, on the part of the Royal Geographical Society, to authorise and second the resumption of Humboldt's scientific investigations on the Orinoco and its affluents. With that permission granted, I would submit that the expedition should be assembled at Trinidad, in two or more vessels of suitably light draught and power, and set out from that island at the right time of year; regard being had to the rains, rise of rivers, &c. Immediately below the mouth of the Meta there are rapids. It is possible, however, although there is plenty of water in the narrow channels between the rocks, and Humboldt represents that there is no real danger with a good pilot, that it might be desirable for the permanent navigation of the Meta, that the line of boats should be separate, so as to avoid the rapids, unless indeed they could be easily turned by a slack water navigation.

Our situation at Trinidad, lying at the very threshold of this mightiest highway for the transit of commerce and civilisation, would greatly facilitate the steady prosecution of these deeply interesting explorations.

COLONEL SMYTH O'CONNOR, F.R.G.S., said he had resided many years in Trinidad, and had been up the Orinoco. The views of Admiral Elliot were of the greatest consequence to the British colony. He had no doubt that Trinidad, Tobago, and the other islands off the Spanish Main, originally formed part of the South American Continent, but had been torn from it by

the vast volume of the Orinoco, and divided into islands. Twenty-two years ago Colonel Hamilton navigated the Orinoco up to Angostura. At that time he was engaged with the Columbian Government, and had received near Angostura the grant of an immense tract of land, enclosed by mountains on one side, and bounded by the river on the other. He cultivated corn and a variety of other produce which he exported to Trinidad. But the chief production was cattle, reared from importations obtained from Spain, England, and Scotland, and so great was their value that horses sold at Trinidad for nearly 400 dollars, or 80*l.* sterling. That island was supplied with mules chiefly from the Orinoco, from near Angostura.

MR. JOHN LEE, F.R.G.S., suggested that the Government should send some steamers up the river to make a proper survey, and obtain statistical information as to the productions of the country. An expedition of this nature was not likely to be carried out by private enterprise.

The PRESIDENT replied that this was the course proposed by Admiral Elliot. The object of his communication was to have the subject properly discussed, and if considered desirable, that the Council of the Geographical Society should recommend the plan to Her Majesty's Government. He should like to hear the opinions of commercial gentlemen on the subject, and he thought it fortunate that they had present a gentleman of Colonel O'Connor's information to justify the application of Sir Charles Elliot.

2. *Account of the Search for the North-Australian Exploring Expedition under Mr. A. C. Gregory.* By Lieut. W. CHIMMO, R.N., F.R.G.S.

Read, Jan. 12, 1857.

FROM accounts received from Sydney, N.S. Wales, in February 1856, the Secretary of State for the Colonies had serious apprehensions for the safety of the North Australian Expedition; and having applied to the Admiralty for an officer to lead a searching party, I was selected for this mission, and with two hours' notice to prepare, embarked in the 'Royal Charter,' which was on the point of sailing for Melbourne, and made the passage—one of the quickest on record—in 59 days and 6 hours.*

On arrival at Sydney, a delay of two months occurred. I remained waiting instructions from the 19th of April to the 18th of June. After the searching party was collected and organized, I received instructions from his Excellency the Governor General to proceed in the 'Torch,' which had been chartered from her new owners, "*First*, to the Albert River, whence, after making a minute search, and feeling satisfied that they had not yet arrived there, to proceed *secondly*, to the Victoria River and render every assistance that their condition required."

On June 24th, 1856, the 'Torch' left Newcastle, after having been

* Lieut. Chimmo had just returned from Australia, where he had been employed in the 'Torch' steamer in surveying the coasts.—*Ed.*

crammed with 150 tons of coal, or 70 more than she had ever carried before; for which reason the Inner Route to Torres Strait was chosen, where, at all events, smooth water was certain.

On July 17th I went as close as prudent to the coast about Albany Island and Cape York, to view a spot on which I hoped soon to see an English flag. It was impossible to pass it without feeling how well adapted the island seemed for a preparatory penal establishment, or until our knowledge of the effect of the climate on European constitutions, was more truly and generally known in the depths of the Gulfs of Carpentaria and Cambridge.

Albany Island.—We first passed a bold and regular land of about 400 feet in elevation, nearly three miles long by one broad, lying in a N.W. and S.E. direction, having smooth grassy slopes with valleys of trees, terminating on the S.W. side in rocky cliffs and bold headlands, having on its N.E. side a pretty group of small islets. Here we saw but one canoe, with seven men in it.

Should an establishment ever be decided on, and which has been some time in contemplation, on account of the increased traffic through Torres Strait, for coal depôts for steam communication, as well as a refuge for the shipwrecked mariner, which latter has become so necessary, I have not seen any spot better adapted than this, particularly in a geographical point of view, a commanding position, and exposed to a healthy brisk S.E. trade for half the year. How the N.W. monsoon affects it, I know not. Many would be the benefits arising from an establishment at Cape York or Albany Island, particularly as Port Essington, from its unhealthy site, has been abandoned.

It would benefit the natives, who may be made tractable, as at Port Curtis, Wide Bay, &c., a home or refuge for the shipwrecked sailor could be established. At present he proceeds to Booby Island, where, if his patience be exhausted, he makes a desperate effort to reach Copang. Stores of various sorts for shipping would find many a purchaser, as scarcely a vessel comes through the Barrier without loss of anchors or spars.

Cape York is not so attractive as Albany Island, and is objectionable from being partly surrounded by shoal-water bays. It is particularly barren in appearance. Fresh water is abundant in Evans Bay, two miles from Albany Island.

On arriving at Booby Island on the 18th of July, and searching all the documents in the Post Office there, it was ascertained that Gregory and his party had not passed that way on their return to Sydney. After rating the chronometers and leaving notices for any of his party who might call there, the 'Torch' sailed for the bottom

of the Gulf of Carpentaria, passing through its centre. The bar of the Albert River not allowing the 'Torch' to pass, I proceeded in her boats on the 2nd of August to ascend the river, and after a minute search of six days, came to the conclusion that neither Gregory, nor any of his party, nor the vessel in attendance on them, had, as yet, arrived there.

On arriving at the source of the river, 54 miles from the ship, we all took a searching stroll to the "plains and lands of promise," which did not present to me that boundless luxuriance I was led to expect, the whole country being parched and arid. The long grass had been recently destroyed by fire; the large gum and acacia trees, except those overhanging the river, wore quite an autumnal aspect; the land was furrowed and torn away by the deluge of rains during the N.W. monsoon; huge trees were torn up by the roots, depositing the finest of the soil in the river, and leaving on the surface a few flattened porphyritic stones, with quantities of small perfectly sound ironstone particles. Whether the fires which destroy the grass, and eventually the trees, are accidental or intentional, I cannot tell; but I believe the natives frequently set fire to the grass to seize their prey, such as kangaroos, snakes, &c. In fine, I was not very favourably impressed with either the importance of the stream or the richness of the country, although I saw it under the most favourable circumstances, the winter and S.E. trades. What it must be in the summer, during the north-west monsoon, during hot winds and changeable weather, I would hardly venture to say; the thermometer in the shade was max. 72°, min. 56°, in the sun 134° 5; the amount of ozone was 1 to 3.

I placed notices on every conspicuous portion of the banks of the river, to inform Mr. Gregory that he was not forgotten, and that we were in search of him to give him a fresh supply of provisions and ascertain his wants.

We had but one interview with the natives. On descending the river, in turning one of its bends, up started eighteen, whose numbers soon increased to twenty-eight. They were all armed with spears, boomerangs, waddies, and shields, and were exceedingly noisy and clamorous; so much so that I expected every moment to see a boomerang, which the chief or spokesman held in his hand, whirled at us. I ordered two muskets to be held in readiness, in case he should have temerity enough to throw it. They endeavoured by the most exciting gestures to persuade us to land, but this I would not permit, fearing a collision in their angry moments. I, however, made signs to them to retire a short distance, except the chief, when I would land and speak to him. This they did,

and they all sat down on a small elevated spot and watched most intently our proceedings. I then backed the boat in, and gave the chief, biscuits, pipes, tobacco, and fish-hooks. He also obtained a large coloured pocket handkerchief, which nearly distracted him with joy; wrapping it round his head and waist, and dancing most vigorously on his heels in the mud, sinking at every jump up to his knees. Their anger had now subsided, and they appeared pleased. I cannot tell what this demonstration of violence could be owing to, and I dreaded any act of hostility for the sake of those coming after us. In some of these natives I observed the loss of the eye-tooth, which indicates that they had arrived at the age of puberty, generally 16 to 17. Horizontal scars, along the body, were also seen, 5 to 6 inches in length, gradually decreasing from the chest downwards. Circumcision was also general. There were no women among them, which was a sure sign that their visit was not intended to be friendly. They followed us for 15 miles along the banks, until a creek prevented any further communication. We gave them some parting presents, including another coloured handkerchief, and they brought their weapons to barter freely and eagerly. I was glad when they turned their backs on us, evidently pleased at the meeting. Every expedition that had visited these shores had suffered from the treachery of the aborigines, and I should have exceedingly regretted if any circumstance had occurred which would have left a bad impression or kept up any spirit of revenge on those so soon to follow in our footsteps.

For 12 miles, on first entering the river, nothing can be seen but a dense mangrove bush on either side, growing on soft mud. Beyond this, the monotony is slightly changed by the elevated appearance of some gum and acacia trees. Then, where the river is deflected in a south and south-west direction, bare patches of cliff from 10 to 30 feet in height, separate the mangroves and diversify the scene. Small mangrove islets with sandy spits, at low water, appear. When nearly 40 miles up the river, a change is altogether met with; the mangroves are separated by various gums and acacias, with an occasional palm-tree. On the borders of the river, bamboos, rushes, creepers, and long grasses form altogether a dense and diversified foliage. The river is, in general, tortuous, and presents when low, a far different aspect to that at high water. Snags, sand and mud banks, embryo islets, forming round sunken logs, are, at high water, all covered, and an unbroken surface is presented.

I visited the Bountiful Island and Sweers Island of Flinders. At the former we found turtle abounding on the beach and in the

lagoons among the coral reefs, 60 of which were taken upwards of 3 cwt. each. In my notices, I informed Mr. Gregory of this fact, and recommended his sending the vessel there, if in want of fresh provisions. I also found in a hard, sandy patch, on nearly the centre of this island, the bones of five persons, who had either died of starvation or had been buried there. They all lay in the same position with heads to the north; I do not think a grave had been dug, but that the drift sands had accumulated about the bodies, and formed one grave. They had no spears, arms, or any implements near them. A few turtle-bones, shells of the *haliotus* and *helix*, were in heaps around. There was not a jaw to be seen with the upper tooth extracted, which is the custom among the North Australians when they arrive at puberty. This circumstance made me conclude they were not aboriginals, but probably a portion of the crew of the Malay proa we had found wrecked on Sweers Island. The North Australians generally bury their dead on trees, or in caves, wrapped in bark or matting, and with their heads to the east, and have always some of their war or fishing implements near them. No indications of these funeral ceremonies were near these skeletons, of which I have preserved one head for examination.

On Sweers Island, the fresh-water well of Flinders was destroyed by the natives; not, I believe, intentionally, but accidentally, from constantly running in and out to draw water. The well dug by Captain Stokes of the 'Beagle,' was also destroyed, but proving to be in the best position, I had it redug and cleared, and we obtained five tons of water from it, and left a notice also to show the Australian expedition where they would find it; planting near and about it pumpkin-seed, onions, and Indian corn. The natives were few and very shy. If they, who were watching us most intently from Bentinck Island, were surprised at seeing a ship under sail like the 'Beagle,' what must have been their wonder when they saw the 'Torch' move through the water by smoke? There was not a native seen on Sweers Island, although there were many there, and their not coming near us may be possibly attributable to fear at so wonderful a structure, moving without the aid of sails or wind.

About a mile east of this well, we found the remains of the 'Investigator's' well, completely blocked up, having only a slight undulation to mark its spot. We halted under the "tree," which still plainly bore the inscriptions of the 'Investigator' and 'Beagle,' the former carved 54 years since and the latter 15. Fortunately I had a bottle in my bag, and I made all heave-to under the tree and join in drinking with a glass of the "Queen's own" to the memory of the adventurous and intrepid Flinders, and to the health

of the next follower of his footsteps, Captain Stokes, R.N., to which was added, as a matter of course, "three cheers."

On our return to the well, we picked up a piece of a lower-deck mess-plate (china), and also a metal tray or inkstand, of European manufacture, the lid of which was gone. It is about 9 inches long, by 5 wide and 3 deep, figured on the outside with leaves of a tree that would puzzle a botanist. Such a thing could scarcely have been left there by the 'Beagle;' and if in the hands of the natives for fifty-four years would have been destroyed if left there by the 'Investigator.' The well, for which we are indebted to the 'Beagle's' visit fifteen years since, we found to be 25 feet deep, the water dripping into it through a rock of concreted lime, sand, shells, and pebbles. Sweers Island is low, thickly wooded with gums, acacias, and a straggling pandanus, and dense grass; the soil is capable of producing Indian corn, yams, cotton, &c. This, with Bountiful Island, would make good headquarters for an exploring party, and I hope Gregory will find it out.

I again passed out of the Gulf of Carpentaria, the greatest depth of which is 46 fathoms, with a soft, adhesive mud, gradually decreasing its depth from the centre to the low, muddy mangrove shores which border the east and south of the Gulf. The only phenomenon worthy of remark was the difference of the density of the sea-water at the depth of the Gulf and at its entrance in lat. 13°, amounting to 7° 7'.

On the 26th of August, we entered the Victoria River, after carefully and anxiously, but unsuccessfully, searching the north coast between the Gulfs, more particularly Treachery Bay, where the expedition first landed, and where Captain Stokes was speared and so nearly lost his life. On my first anchoring in the river, I observed a mark erected on Entrance Island, and near it a bottle containing a notice that the portion of the expedition in charge of Mr. Gregory had left for the Albert River on the 21st of June, and that the schooner 'Tom Tough' had gone to Coepang, in Timor, for repairs.

It was now very evident that my detention for two months at Sydney, might be seriously felt by the expedition. Had I set out on my first arrival, I should have been in sufficient time not only to supply the party with provisions, stores, and despatches, but also to have discharged the schooner and have acted in concert with Gregory, in a steamer, until the completion of his mission.

I proceeded 60 miles up the river in the 'Torch,' and then 40 miles farther in the boats, to Gregory's abandoned camp, where I found another notice of his movements.

After replacing these notices, and leaving one of my intended movements, for Gregory or any of his party, I retraced my steps to the ship, and found that while the crew were watering ship they beheld an interesting relic of the 'Beagle.' Inscribed in large letters on a tree nearest the well, were these words :—

"This river was discovered, by the officers of H.M.S. 'Beagle,' on the 18th Oct., 1839, and was named the 'Victoria,' in honour of Her Majesty, the Queen of England."

Here I had the good fortune to find the rare and interesting bower-bird's nest (*Chlamydera nuchalis*) among the mangroves, and scarcely above high-water mark at springs.

On arrival at Gregory's camp, 6 miles below Steep Head, we found it looking like an English farmyard, with thatched houses, huts, sheep-pens, horse-sheds, forge, oven, &c. The spot was well selected. We landed on a pier formed of large stones and pigs of ballast. In our road lay iron hoops, rope, tubs, buckets, old clothes, Indian corn, old boots and shoes, pieces of harness; and we came to the oven, in the interior of which, protected by four pigs of iron ballast, was a bottle, containing a notice to the following effect :—

"Camp, Victoria River.

"On Saturday, 21st June, 1856, the exploring party of the N. A. Expedition, consisting of seven persons, left this camp, on their way to the Albert River, in the Gulf of Carpentaria; and on Wednesday, July the 2nd, the remainder finally abandoned the camp and proceeded down the river to join the schooner 'Tom Tough,' which had dropped down to Shoal Reach about three months previously. The vessel will sail, as speedily as possible, to Timor, whence, after obtaining supplies, she would proceed to the Albert River, and the detachment of the Expedition on board will form camp and await the arrival of Mr. Gregory. Subsequent information will be left on Entrance Island.

"John Finlay, carpenter of the schooner, died April 22nd, 1856, and is buried near a gouty-stem tree, marked, with the dome, bearing W.N.W. $\frac{1}{4}$ a mile (Tuesday evening the 1st of July).

"The finder of this document will greatly oblige the Expedition by giving it every publicity, and, if possible, by forwarding it to his Excellency, the Governor of New South Wales, or to any other of the Australian colonies.

(Signed)

"T. BAINES."

After perusing this, we went to the forge, where another paper was buried, containing a similar notice. We returned to Mr. Gregory's hut, and, having drank success to his expedition, read all the interesting notices over and over again.

I passed an hour at the camp, admiring all the arrangements. It

consisted of seven thatched houses, three huts, some sheds for cattle and sheep-pens, two deep and good wells, and an entrenchment all round. No natives had been near the camp since Gregory's party left. A road was cut several miles, in a S.S.E. direction, as straight as an arrow. I sat down at Gregory's table, and penned a notice, after placing which, and while the men were getting their dinners under a shed, I amused myself by sketching the camp from Baines's window, as it was too hot to venture out to do so. The boat's crew, having found a small pot of black paint, inscribed some amusing notices outside the doorways. On the door of Mr. Baines's hut, after I came out, I saw hanging on a board,—“Victoria Hotel. Good Beds, &c. Ginger Beer and Refreshments.”

The evaporation in this river is very excessive, amounting to 13° between the wet and dry thermometers. The backs of all our books parched and curled in every shape and form. A boxwood ruler, on my table, warped 3-8ths of an inch in 24. A boxwood thermometer, 3-8ths of an inch, warped 1-10th, threatening to break the glass tube.

Coming out of the Victoria River, the ‘Torch’ struck on a bank, where at low-water her keel was 7 feet above the low-water line. This bank has accumulated from the strength of the tide, consequent on a rise and fall of 24 feet, since Captain Stokes's survey in 1839, when he found $\frac{1}{2}$ fathom at low-water springs.

I had intended to make a few remarks during my week's visit to the Victoria River, but Captain Stokes gives so excellent a description of it, that it is unnecessary for me to do so.

Finding that the schooner had only left six weeks since for Coepang, I made all haste after her, but, on arrival there, found that she had been sent to Surabaya for docking and repairs.

At Coepang, I received a request from Mr. Baines to proceed to the Albert River, but as at the same moment Mr. Baines might be starting from Surabaya in another chartered vessel, and we should consequently be sailing side by side until anchoring off the mouth of the river, and then find that two vessels were performing one and the same service, I, the next morning, started for Surabaya, still with a hope of communicating with him. On my arrival there, however, I found that this section of the Expedition had started in a new chartered schooner on the 31st of August; and, from her being a well-found, substantial vessel, she would reach the Albert River about the end of October, long before the Expedition could suffer any privation from hunger.

The PRESIDENT returned the thanks of the Society to Lieut. Chimmo. He rejoiced that they had among them a gentleman who had come back from fol-

lowing the expedition, and had brought home some additional information of importance. It appeared to him that there was a lapse in the paragraph as to no other ship but the 'Torch' having been in the Gulf of Carpentaria; it could not have been the intention of Lieut. Chimmo to say so, after the voyages of Flinders and Stokes.

LIEUT. CHIMMO replied that all former vessels had only coasted the Gulf, without examining its centre.

The PRESIDENT was afraid that without this explanation, it might be supposed that the region had not been properly explored.

MR. JOHN CRAWFURD, F.R.G.S., had listened with great interest to Lieut. Chimmo's spirited account. In his opinion it was a very correct one, and one of sound judgment. In describing the country at the mouth of the Albert River as very arid, hot, and sterile, he showed it to be wholly unfit for colonisation by Europeans; and therefore, he concluded, wholly unfit for a penal settlement. This opinion, Mr. Crawford said, he had stated at a very early period, and he thought Lieut. Chimmo's account most perfectly confirmed it.

DR. HODGKIN, F.R.G.S., inquired of Lieut. Chimmo whether the natives at the mouth of the Albert River resembled those of Southern Australia. He had the opportunity of seeing two who were brought to England by accident by Captain Strickland, about eighteen months ago. They were tall and slender, and appeared to be friendly disposed. One of them died, and in taking the other back Captain Strickland took considerable pains that he should convey to his countrymen a friendly feeling towards the whites. It appeared that Lieut. Chimmo did not find them well disposed. Dr. Hodgkin said he was also struck with the fact of their being seen in a canoe that carried five or six people; the natives generally were so little competent to perform any work of art that the construction of a canoe of this size indicated an advance which rather surprised him.

LIEUT. CHIMMO replied, that the natives at the head of the Gulf of Carpentaria were the wildest people he ever met in his life. He was not favourably impressed with the Australian race. On a previous occasion he took nine of them from Percy Island to Sydney — the murderers of Mr. Strange, the Government geographer. He had seen canoes at Percy Island, that carried five or six persons.

The PRESIDENT said, much as the Society had been interested in the success of this expedition, and warmly as they had instigated the Government to pursue it, yet they had had no sort of control as to the conduct and progress of it. The Society was not in any way responsible, farther than for recommending certain gentlemen who had gone out as scientific members of the expedition, and who had performed their duties admirably.

3. *Proposed Communication through North America, from Vancouver Island to Hudson Bay.* By THOMAS BANISTER, Esq.

THE routes proposed by the Americans to the southward of the 49th parallel of latitude, as contained in the 'Report of the Secretary of War on the several Pacific Railroad Explorations,' are five in number, and are enumerated in the following order, proceeding from north to south:—*First.* The extreme northern route (Major Stevens's) between the 47th and 49th parallels of latitude, and striking the Pacific at Puget Sound. *Second.* The route of the 41st parallel (Mormon route) by the South Pass, or Great Salt Lake, to San

Francisco. *Third.* Route of the 38th parallel, or Benton's. *Fourth.* Route of the 35th parallel (Rusk's) to San Pedro, on the Pacific. *Fifth.* Route of the 32nd parallel, or the extreme southern route, *viâ* Texas and New Mexico, to the Pacific. The third and fourth routes are considered next to impracticable; while the three others are attended with great difficulties and expense. Mr. Banister considers that the routes through British North America are not only the most practicable, but also, in a national point of view, the most important. He proposes starting from Fort York on Hudson Bay, and proceeding westward as far as Puget Sound, opposite Vancouver Island. The Hudson Bay Company have certain interests, but the Crown has never abandoned its sovereign rights over these territories. The Company deserves credit for its conduct, and for important things it has carried out; but the time has arrived for the Government to consider, whether the interests of the empire do not demand a reconsideration of the whole subject of the colonisation, &c., of the regions on the west coast of America from Hudson Bay.

MR. BANISTER had derived information from a gentleman who had been many years in the employ of the Hudson Bay Company, and had passed along the line, as well as from others acquainted with the country. He had been induced to make the proposition by the great demand for a passage across North America, evinced by the efforts made by the Government of the United States to find such a passage in their own territory; and he looked at the question as it affected British interests. The late proceedings in Canada, the opening of the Grand Trunk Railway, the passage into Lake Superior and Lake Michigan, the rise of Chicago, a city of yesterday, with a population of 100,000 inhabitants—all showed the rapid advance of those regions. The evidence was all in favour of the northern country becoming habitable. The travels of Sir George Simpson, Sir John Franklin, and others, were conclusive as to the richness of the country in mineral as well as agricultural produce. A gentleman, Mr. Low, had informed him that the natives on the eastward of these mountains possessed horses, and lived out in the open prairie in winter. Horses would not exist on the east coast, and that was a proof of the mildness of the climate in the interior. He was satisfied that the evidence was in favour of the necessity of the line he had proposed; and he brought it forward with the view of the Society inducing the Government first to take measures to ascertain the practicability of the country; secondly, if practicable, to decide upon establishing the line of communication; and thirdly, to devise the mode of carrying the scheme out.

The PRESIDENT was of opinion that the communication opened out very broad and important views for the consideration of geographers and statesmen. The meeting was, fortunately, attended by gentlemen who were well acquainted with these portions of North America; and with reference to the boundary line, the 49th degree, they had recently brought before them a project from Mr. Palliser, which had already been approved by the Council, for an examination of all the region from that line to the Saskatchewan, as well as the rocky and elevated region to the west of the Prairies, in order to see whether it be practicable to form a good road for British subjects without deflecting into the American territory. Mr. Palliser was in the room; and, having lived a

good deal in the country, must be able to speak to the practicability of the proposed route, as well as of forming railroads. They had also present Colonel Lefroy, who was twelve years in Canada; he had enriched science by magnetic and other observations, was an admirable geographer, and well acquainted with these regions. It was seldom they had the opportunity of having a subject better discussed.

COLONEL LEFROY, F.R.G.S., said, that Mr. Banister's scheme proceeded on the assumption that whatever was not physically impossible, was commercially possible. There was certainly not a physical impossibility in the formation of this railway; but it was under conditions entirely different from those which attended the formation of railways in this country. Mr. Banister began by pointing out the analogy of Hudson Bay with the Baltic. The Baltic had its inlet on the south, Hudson Bay on the north, which made an important difference. Hudson Bay could only be entered two or three months in the year, the Baltic at all times. In ascending between Fort York and Lake Winnipeg, the traveller passed over a rugged and difficult country, of a spongy nature, 900 or 1000 feet high, until he came to Lake Winnipeg, which was itself 800 feet above the level of the sea. He had then to go through a region without inhabitants—for the whole population of this vast internal region did not amount to 100,000 souls—and then to pass over the Rocky Mountains. The general character of the country up to the Rocky Mountains was a plain, ascending gradually, intersected by extremely deep rivers. There would be some tremendous bridging required. A part of the district, which must necessarily be passed, was a mere spongy, elevated table-land, from which rivers took their source in all directions. It was not physically impossible to carry a railroad there, but it would not be commercially possible. Passing over the Rocky Mountains, the traveller arrived at Fort M^cLeod, considerably on the west side of the mountains. That fort was the nearest station to the Hudson Bay Company's line on the Pacific; and such was the difficulty of communication, that the hardy traders in the employ of the Company, though they had been trying several years to establish a communication with Fort M^cLeod from the west, had never, down to the period in which he visited the country, —1843-4,—succeeded in doing so. All these were reasons why he thought this railroad, which had been urged on general grounds as a great necessity, was not likely to be realised in our days.

The REV. MR. NICOLAY, F.R.G.S., agreed with what Colonel Lefroy had said with regard to the northern and western portions of the country near the sea. Although a railroad would be scarcely desirable in the direction indicated, there was no reason why, in the time of our children, if not in our own, one should not be carried across the plains to the south of the river Saskatchewan. As far as he was aware, he believed no Englishman had ever crossed those plains to the north of 49° directly to the Rocky Mountains. He hoped Mr. Palliser would be the first to do so. Supposing there should be no impediment in that direction, there would be no difficulty in crossing the Rocky Mountains. The pass indicated by Mr. Banister had been more than once traversed by the officers of the Hudson Bay Company, and he believed there were some in the room, who had traversed it themselves; it was not the best. From the account of his journey, given by Sir George Simpson, there seemed to be two distinct ranges between which the river Kutani flowed to the south. There was a pass to the south, leading into the valley between the two ranges, over which the emigrants mentioned by him crossed—whether to the south or north of 49° he was not prepared to say; but that there was an easy pass in that direction was well known. The difficulty in crossing from the northern of these passes to the Pacific, as Colonel Lefroy remarked, was no doubt very great. All this country was covered with small lakes—a network of lakes and rivers, which at certain seasons must be untraversable, and it must be centuries

before it could be inhabited. But the country to the south and east of the northern branch of the Columbia was, he apprehended, of a very different character. Whether it was a country through which a railroad would be carried in our time, was another question. As to the desirableness of opening up a communication with Vancouver Island all would agree, especially as the Canadians began to feel cooped up, and wanted a way to the west. The value of Vancouver Island was becoming better known, and he anticipated great advantages, commercial and otherwise, to result from Mr. Palliser's explorations. The plains to the south of the Saskatchewan might supply Europe with corn, brought down to Hudson Bay. A home voyage once a year was quite another thing to keeping up a constant communication.

COLONEL LEFROY said with reference to the exportation of articles from the Saskatchewan, there was a considerable amount of import and export going along that line, inasmuch as all the goods brought in by the Hudson Bay Company were carried by that route, as well as the furs which they obtained in exchange. The price of the inland freight from York-Factory to the Red-River Settlement, was 18*l.* per ton, when he was in the country.

MR. J. PALLISER, F.R.C.S., was inclined to think there was no pass known within the English territory, except the Athabasca portage, which was considerably to the north. There were two passes to the south which he believed were both in the American frontier. Even Sir George Simpson himself, who took the more northerly of the two, passed within the American frontier. Still he had heard from conversation with the hunters and trappers—Red River people—that there was a pass in the English territory; but he had only their word for it. He crossed the frontier when he was at White-earth River, the most northern part of the Missouri. But with that exception his wanderings and hunting adventures were on the American side. Still, all the nations in that part of the country might be said to belong to both English and United States territory. For instance, the Assineboins, the people he had most dealings with, wandered on both sides of the line. Also the Black Feet and the Minatorees wandered backwards and forwards, though their country was strictly speaking confined to the American side. The Indians seemed to have a very great respect for the English. Whenever he was pointed out as an Englishman, they used to pay him a sort of additional respect.

MR. BANISTER, in reply, said that early last year he had been appointed agent to parties in Vancouver Island, which brought him in connection with a great number of persons who were intimately acquainted with the interior. The natives on the coast of Queen Charlotte Islands were a very superior class of people, in proof of which he would put into the hands of the President a piece of sculpture cut from the tooth of a walrus or something of that sort. The men of these islands were almost white. They were very robust. They made fine sailors, as good as the New Zealanders. On one occasion they brought down a vessel commanded by an Englishman. With regard to a pass being found for the transit of merchandise within British territory, it was a matter of great importance, and might throw the carrying trade between California and the Atlantic States into our hands. The trade depended on the termini of the route, rather than on the country through which it passed. At all events the inquiry was well worthy of being made. A gentleman in a letter to him stated that there was a pass up the Fraser River, where the mountains fell away, that it was a very narrow passage without any obstructions, and led into the valley of the Peace River. The communication, he proposed, might not be entirely by railroad as in England, but partly by railroad and partly by other means. In order to carry out the work, he did not see why the Government should not employ criminals, and thus make them the pioneers of civilization.

MR. PALLISER thought it must depend upon astronomical observation to

determine the position of the passes adjacent to the frontier. There were two passes close to one another, and the question was whether they were not both within the American frontier, or whether one might not be within the English territory. It was a very nice point to determine. As to what had been said about the natives of Vancouver Island, he thought the people of the western coast were very different from those on the eastern side, and resembling more the Polynesian race.

The PRESIDENT said they had to thank Mr. Banister for having brought the subject forward. It had given rise to an excellent discussion, that had thrown much light upon a subject of the greatest importance to every Englishman. The practicability of railroads was a subject incidental and collateral. Their first great point was to determine the physical geography of the region—therefore the projected exploration would be of considerable value, as it would set at rest whether there was a practicable route across the Rocky Mountains or not. He was glad to see Mr. Palliser, who from his acquaintance with the country, his skill as a sportsman and the good use he made of his opportunities, was capable of exploring these difficult regions—he was delighted to see him sitting next to the great explorer of Africa, Dr. Livingston. These were the gentlemen who found out the paths, by which civilization could be advanced in these distant and difficult regions. Railroads, however, must fall in afterwards. In the first instance they had to determine the geography of the Rocky Mountains, with which the world had made little or no progress since the days of Mackenzie.

Sixth Meeting, Jan. 26, 1857.

SIR RODERICK MURCHISON, PRESIDENT, in the Chair.

PRESENTATIONS.—*Robert Benson, William Benson, C. L. Gruneisen, John Costerton, and J. L. Statham, Esqrs., were officially introduced upon their election.*

ELECTIONS.—*Capt. Hartstene, of the United States Navy, recently in command of H. M. S. 'Resolute,' was elected an Honorary Member; and Dr. Alexander Armstrong, R.N.; Capt. John Buillie, Bengal N.I.; Capt. Thomas Blakiston, R.A.; the Marquis of Blandford, M.P.; Dr. W. F. Cumming; Dr. A. T. Chalmers; Capt. L. R. Elliot; Lieut.-Col. P. Faddy, R.A.; Hon. G. Fitzclarence, R.N.; Thomson Hankey, Esq., M.P.; Capt. W. A. Pope; the Hon. Stephen E. Spring Rice; Sir Macdonald Stephenson, C.E.; Capt. B. J. Sullivan, R.N., C.B.; Col. J. Temple West; the Right Hon. J. Stuart Wortley, M.P.; Capt. Henry J. P. Woodhead; and C. T. Arbuthnot; Richard Blanshard; John Utlay Ellis; F. L. Evans; T. H. Farrer; Z. D. Hunt; George Lee; Eckard Sullivan, and Richard H. S. Vyvyan, Esqrs., were elected Fellows.*

DONATIONS.—Among the principal donations received since the former Meeting were, several Russian maps, and the Sardinian Staff maps of the Crimea, presented by Felix Wakefield, Esq.; the Ord-

nance maps of all the counties of Ireland, on the scale of six inches to the mile ; together with general maps of Ireland ; Black's Atlas of North America, presented by the publisher ; Atlases of heights, by J. M. Ziegler, Corresp. F.R.G.S. ; with the Transactions of the Darmstadt Geographical Society, of the Hakluyt Society, &c.

ANNOUNCEMENTS.—The Sixth Number of the 'Proceedings,' published that day, would be distributed to the Fellows by Mr. Stanford, of 6, Charing Cross.

The Papers read were :—

1. *Extract from a Letter addressed by TH. MACLEAR, Esq., H. M. Astronomer at the Cape, to the Secretary.*

" Royal Observatory, Cape of Good Hope,
Nov. 3, 1856.

" The object of this letter is to report progress in the reduction of the astronomical observations, which that remarkable and excellent man Dr. Livingston, made for geographical positions, on his track from Loanda across the continent to Quilimane. He has sent them to me for reduction, and I am anxious that they should be in Sir R. Murchison's hands, according to Livingston's request, with the least possible delay : or rather, I am anxious that they should meet him in England at the right time—the time when the Society and the public at large, will be doing him due honour for services without a parallel.

1. To expedite the reductions, I had skeleton forms printed for the computation of *time from altitudes* ; for *altitudes from time* ; and for *Greenwich time* from the lunar distances.

2. His observed lunar distances were compared (roughly) with tabular lunar distances, in order to detect errors of date as to the day of observation—a common source of error where civil clashes with astronomical reckoning.

3. The watch-error was computed from each altitude, whether observed for watch-error or for the calculation of parallax and refraction, to detect errors of entry or of transcribing ; and while this was going on, another computer was following closely, calculating the parallaxes and altitudes for the times of lunar distance measures.

The total number of altitudes computed for time is 214, exclusive of repetitions or checks.

To this point the reductions were brought up on Saturday. To-day we commence the lunar distances, which will be computed by the rigorous trigonometrical process, viz. the final computation ;

for I find they must be repeated, as the assumed longitude sometimes is a degree in error; therefore at least two, but generally three, approximations will be needed.

Thus you will perceive that the only residual errors will be chargeable to the eccentricity or index-errors of the sextant, and to the errors of the lunar tables; and as Livingston unfortunately did not visit the Cape, I have had no chance or opportunity for examining the instrument.

I do hope that Livingston's merit will be acknowledged by the Crown in a substantial form. He is a poorer man than he was fourteen years back, when he landed in Africa. Without reference to higher motives, he has rendered services to science, and perhaps to commerce, such as few men have rendered. His constitution has been seriously injured by thirty-one attacks of fever. In fact, it would be difficult to find another whose claims on public gratitude are so strong."

Yours, dear Sir, truly,

T. MACLEAR.

Dr. Shaw, Secretary of the Royal Geographical Society.

2. *Notes on the Geography of Burma, in illustration of a Map of that Country.* By Capt. YULE, of the Bengal Engineers, F.R.G.S.

In 1855, Capt. Yule had been sent by the Government of India to Amarapura, as secretary to Major Arthur Phayre, then proceeding on a mission to that Court. In drawing up a report of the mission and of the information collected by its members, he had found a new map of the country to be much wanted in illustration of his subject, and this had led him to undertake the compilation in question.

The paper gave some account of the history of the geography of those countries, to which shape was first given by the mission of Col. Symes in 1795; and especially by the collections of Dr. Francis Buchanan, who accompanied that mission. The most important additions to our knowledge were made by the journeys and surveys of various officers, especially of Wilcox, Grant, Pemberton, Richardson, Hannay, and Macleod, between 1826 and 1837. The revolution at Ava, in the latter year, interrupted all such acquisitions for many years.

Some of the chief materials used in the new map, were, a survey of the new British province of Pegu, undertaken by Lieut. Williams, of the Bengal Engineers, and still in progress; a new survey of the province of Martaban, by Mr. Hobday; a survey of the river Irawady to Ava, by Capt. Rennie and Lieut. Heathcote of the

Indian Navy; a sketch of part of the Aracan Yoma range and its passes, by Capt. Yule; and a re-arrangement of the Chinese frontier and the Shan (or Laos) states, east of Burma, from the route-surveys of Dr. Richardson and Capt. Macleod, with additions from other sources.

A considerable error in the longitude of the Irawady at Prome and upwards, as assigned in previous maps, was pointed out. The existence of this error had first been indicated as probable by Capt. Yule, in a memoir on the Passes of the Yoma, submitted to the Government of India in 1853. The surveys since made, have confirmed this indication.

A sketch was given of the political division of the Burmese countries at four remarkable epochs, viz., circa 1500, 1580, 1824, 1854, illustrated by four comparative diagrams. In the first, these regions were shown as divided into numerous kingdoms and principalities, of which the chief were Ava, Pegu, Aracan, Toungu. In the second, Pegu was shown as predominant over nearly all. In the third, Ava had reached the climax of its power, and reigned over a territory, extending from the British district of Rungpur, on the Brahmaputra, to the great river of Cambodia eastward, and to the island of Junk-Ceylon southward, with a seaboard of 1200 miles. In the fourth, Ava was shown again contracted, and cut off from the sea in all directions, by many leagues of British territory.

After a sketch of the natural mountain-boundaries of Burma, the paper proceeded to the detailed descriptive geography of the country, from the upper course of the Irawady downwards to the sea, including the British province of Pegu and the passes of the Aracan Mountains.

An attempt was then made, from various data, to estimate the population of the Burmese empire. The general conclusion was, that the population of Burma *proper*, say from lat. 24° down to our Pegu frontier, is about 1,200,000, or less than 25 to the square mile; and that the population of the whole Burmese empire now probably does not exceed three millions. This does not differ materially from the estimate formed by the sagacity of Mr. Crawford, on the more imperfect data which were available to him in 1827.

An additional section of the paper gave a detailed sketch of the Shan principalities, on the eastern frontier of Burma, respecting which it is believed that no very lucid statement has yet been brought together in print. The chief authorities for this sketch were the journals of Dr. Richardson and Capt. Macleod, in the records of the Foreign department at Calcutta. These have never been published in full, as they merited to have been.

A selection of excellent photographs of Burmese buildings and scenery, by Capt. Tripe, of the Madras army, was exhibited in illustration of the paper.

The PRESIDENT said the Fellows would agree with him in thinking this a most valuable contribution. Captain Yule had brought before them a very large, graphic, and at the same time, he presumed, a very exact view of this country. Capt. Yule had examined considerable portions of the country, and had combined together and collated, as he thought, with singular ability and acumen, all the valuable documents of his precursors. He expressed in his concluding paragraph, that it was much to the credit of the Burmese, with so small a population, to have maintained their empire there, and he might add that it was much to the credit of an eminent geographer present (Mr. Crawford), that he should have made such a just estimate, so many years ago, as to the population of the country. No person he knew had a higher opinion of the talents displayed by Mr. Crawford in his work upon Ava, than Captain Yule; and it was gratifying to know that Mr. Crawford was present to testify to the accuracy of the statements before them. Not only had Captain Yule corrected a great number of erroneous views with respect to the longitude of different tracts, and given the general features of the physical geography of the country, but he had also given some very interesting comparative views of the condition of those vast regions at different periods of history. Captain Yule could have brought before them much more that would have been amusing. There was on the table a portrait of his Majesty the King of Burma, who received the English Mission eating "paw," a substance which his Majesty continually put into his mouth, and chewed so continuously that it was difficult on the part of the Mission to understand what he addressed to them. There was also a view of the celebrated white elephant, which had an entire district assigned for his maintenance. Another view represented the king, with his queen smoking a cheroot in her chair of state, and the British Mission at a respectful distance. Captain Yule had called attention merely to the great geographical features of this region, and to its history, and he had done so with singular ability. He was very glad that his short absence from his post in India, where he was actively employed, had enabled him to communicate so much knowledge to the Royal Geographical Society.

MR. J. CRAWFORD, F.R.G.S.—By the favour of the President he had had the pleasure of reading Captain Yule's Report of the Mission to Burma. It seemed to be printed, but not published. Why, he really did not know, for it did great credit and great honour to everybody concerned—to the nobleman who made such an excellent selection of persons to fulfil that mission, and above all to Captain Yule, who was the principal writer of the volume, assisted by a very able geologist, Mr. Oldham. That book ought to have been published. It was public property; the public had a right to have it: and he hoped it would be published. Major Playre and Captain Yule had gone over the ground, that he went over himself thirty years ago. They had done great justice to all the parties that went before them, to himself more than justice in most respects, although he had a few trifling comments to make upon some portions of the volume. He held in his hand a passage which, perhaps, they would permit him to read:—"Mr. Crawford appears to have been rendered weary, hopeless, and disgusted, by the arrogance and impracticability of the Burmese ministers, and excepting on one point—the payment of indemnity money—made deplorable concessions." Now, he was not aware that he made any concessions at all, deplorable or otherwise. In his own humble opinion he maintained a meritorious amount of obstinacy. He yielded nothing, absolutely nothing. Very great demands were made upon him. The Burmese negotiators demanded

that we should restore all the territories we had taken from them in our successful war of 1826. He did not yield them a single foot: he did not give way in one point of ceremony; nor in any one essential point whatever. Captain Yule had not stated what these deplorable concessions were; therefore he was at a loss to understand what they meant. There was also a foot-note in which a strange sort of charge was made against him:—"When the king on one occasion of Burney's residence, had two of his confidential ministers dragged out and flogged with a rattan for some trifling fault, Mr. Lanciego, an old Spaniard who had been long in the Burmese service, told the resident that the Atwen-woons had only got now what they were once very near getting from Mr. Crawford, who in the heat of one of the conferences, started up and threatened in English to give the Burman negotiators a round dozen a-piece."* He did not mean to say that the Burmese negotiators did not deserve a round dozen a-piece, but he certainly was not the person who proposed to inflict it. He did not threaten the king's ministers with a flagellation, but they intercepted his despatches, and they brought the very individual who opened them into his presence, in the pavilion in which the negotiation was going on. He got up and told them, they ought to be ashamed of themselves, to bring that man into his presence, and he ordered him out of the pavilion, and told them that instead of exhibiting him in that shameless way, they ought to give him a round dozen. Perhaps Captain Yule would omit these passages when he published his important work. There was one point that Captain Yule did admit, that he (Mr. Crawford) paid some attention to the main chance. He did; he would not remit one farthing of the tribute. It was a large sum, a million sterling, a sum not to be trifled with. There were many matters contained in the volume, upon which he could make some observations. The Burmese country very much resembled a great section of America when first discovered—a very remarkable circumstance. There were numerous tribes that had come under the notice of Captain Yule, who were in various social conditions, and speaking distinct languages. All these languages were monosyllabic; every one of them consisted of a single syllable: the people had never been able to put two syllables together, except some foreign words which they had acquired. Our own "fee, faw, fum," was a joke to what they put forth as speech. With respect to the Mission having a permanent location at the Burmese court, Lord Dalhousie had the good sense not to send one. He had been appointed to reside there, and he had seen the impolicy of it. The Indian government persevered for ten long years, and Captain Yule knew what had been the result. Colonel Burney went, but he was absolutely driven out. A successor, Colonel Benson, followed. The Burmese kept him on a sand-bank four months. The Indian government then gave it up, and no embassy was sent afterwards. He would make the same representation to her Majesty's government, and also to the government of the French emperor, who he was told was about to send an embassy to Peking. It would never be established except by the force of cannon; and when established it would be found useless, and the envoy would be made as miserable as possible.

CAPTAIN SHERARD OSBORN, F.R.G.S.—He observed there was a river eastward of the Irawady, which appeared in the charts to be connected with the frontiers of China. Was Captain Yule in any way acquainted with the source of that river?

CAPTAIN YULE.—That river is the Salween. No one knew the source of it. As shown in d'Anville's maps, it came from the north of Thibet. He did not believe that it came from that extreme distance. No one, however, had ascended above the British frontier, and no one knew anything about it, except that it was rocky, and navigable only for small canoes.

* See Yule's Narrative of Major Phayre's Mission to Ava, p. 233.

The PRESIDENT called attention to the geological portion of the work, as communicated by Mr. Oldham, the superintendent of the Geological Survey of our dominions in India. He was associated with Captain Yule in surveying the country, and the concluding part of the volume contained a great deal of important information with respect to the structure of the country, the rocks, and all their relations. The work was rendered additionally valuable from its observations on the statistics of the productions of the country, including the mineral productions with the observations of Mr. Oldham.

MR. CRAWFORD.—He ought, in justice to the nobleman who obtained this annexation of Aracan and Pegu, to mention an important fact respecting them. It was well known that Bengal—rice-producing Bengal—was a densely peopled country. The consequence was that the price of rice had been constantly rising. Aracan and Pegu were countries of a totally different description. They were unpeopled. Captain Yule did not estimate the population at above 25 inhabitants to the mile, whereas there were some portions of Bengal which contained 600 to the square mile. There was a great abundance of fertile land in the valley of Aracan. The price of corn and rice was regulated by the quantity of land of the first quality, capable of producing it. All the land at present in use in Aracan for the production of rice, was of the first quality. The result was that the export of rice from Aracan alone, though a country of but 10,000 miles in extent, was greater than the exports from all Bengal together. In former times the settlements to the eastward—Penang, Singapore, and all the countries in that direction—used to be supplied by Java. The policy of the Dutch, by displacing rice and encouraging other productions less profitable to the people, had been such as to enhance the price of rice to such an extent that these districts were now supplied from Aracan. A very large amount of the rice of Aracan was also exported to Europe, to the value of one million sterling annually, as he had been informed by a merchant connected with the trade. These facts showed that our Burmese possessions were likely to become important countries.

3. *Journey across the Kuen-luen from Ladák to Khotan.* By the Brothers SCHLAGINTWEIT.

Communicated by Col. W. H. SYKES, V.P.R.G.S., etc.

PROCEEDING from Ladák, through Nubra, to the Pass of Karakorum, we were able to pass the frontier of Ladák, and to extend our observations over very nearly the whole breadth of the Kuen-luen Mountains. We estimate (not yet having reduced our astronomical observations of latitudes and longitudes) the distance we travelled in Turkistan, before returning again into Ladák, to be very nearly 300 English miles.

We left Ladák July 24th, 1856, went by Laoche Pass (17,600 feet *) to the valley of the Shayuk and Nubra; from Nubra we crossed the Sassar Pass, about 17,500 feet. We stayed two days on the Pass itself to make magnetic observations and to enable us to

* All the heights in this Report are only approximately correct. Very good corresponding observations were taken at Ladák, but we have not yet found time to make the necessary calculations.

reach the summit of the Sassar La—20,000 feet—from which we had, as we anticipated, a very extensive and interesting view of the large groups of glaciers surrounding the Pass, one of the largest accumulations of glaciers in the Kuen-luen.

From the Sassar Pass, our route brought us to the large plateau to the south of Karakorum, the mean elevation of which reaches 17,000 feet. On the 9th August we crossed, without any difficulty, the frontier of Turkistan.*

We were accompanied by Mani, the Putwaree of Nilum; by Marshoot, a former servant of Moorcroft; and by Mahomed Amir, an aged Turkistani, whom we found particularly useful on account of his general knowledge of the country.

We had besides, six horses for ourselves and servants, thirteen for baggage, five Yarkandis, and some fifteen sheep and goats.

The Yarkandis, with horses and provisions, we sent on, and we only met them by chance at Nubra.

Our servants from the plain, accompanied us as far as Sassar, from whence we travelled dressed as Yarkandis.

The day before we passed the Karakorum, at 18,300 feet, we met a large caravan of merchants from Yarkand, to whom we gave out that we intended to march on the Yarkand road, but, as soon as we had passed Karakorum, we left this road and went to the east of Kizilkorum, 17,400 feet, the high-water parting between Yarkand and the Karakash river. In one day we crossed four passes, exceeding 17,000 feet above the sea, but only slightly elevated above the surrounding plateaus.

From Kizilkorum, we followed the direction of the principal chain of the Kuen-luen, now turning to the south-south-east, till we reached a lake, Kiuk-kiul, slightly salt, situated at the northern foot of the Chancumo.

Up to this point, our route had chiefly led us over extensive plateaus 16,000 to 17,000 feet above the level of the sea, of a much greater extent than those to the south of Karakorum; but from the lake we followed the valley of the Karakash river, to the right of which there are no plateaus, while to the left they extend as far as Suget.

The sterility of the plateaus to the north of Karakorum, as well as of the Karakash Valley, is quite surprising; and without the frequent, though not very abundant showers, chiefly caused by the

* See Journal of the Asiatic Society of Bengal, No. IV., 1856, p. 344, for Travels in 1852 from Cashmere through Yarkand, Kokan, Bokhara, and Cabul, in search of Mr. Wyburd.—ED.

great elevation of the ridges, these plateaus would be complete deserts.

In a march of 18 miles, we only met with four species of plants; for many days grass was exceedingly scarce, while for several days we had absolutely none, the grass round the Kiuk-kiul Lake being the only exception. We had taken comparatively a small supply of grain, anticipating in some degree the sterility we met with, which saved our horses from absolute starvation; nevertheless they suffered dreadfully, the more so as the scarcity of grass compelled us to make long marches of 20 to 24 miles a day. Close to the Kiuk-kiul we met with a very interesting group of more than fifty hot springs, chiefly containing muriate of soda and a great quantity of carbonic acid; their temperature varied from 77° to 120° Fahr.

We had already met, in the Valley of the Nubra, with two other groups: the one near Panimik (hottest spring), 78.1° ($= 172.6$ F.), the other near Changlung, 74.1° ($= 165.4$ F.).

After a march of 70 miles in four days, we came to Pumgal, where a route branches off by the Valley of Bushia to Elchi, the capital of Khotan.

From Pumgal a road branches off, as mentioned above, to Bushia and Elchi; and as there was some hope of procuring at these places fresh horses or yaks, as well as food, our men were easily persuaded to proceed towards them. We started August the 22nd, with only two laden horses, and had to cross a glacier pass of 17,000 feet, where, at 10 A.M., we were overtaken by a violent snow-storm, lasting till 6 P.M. The road was extremely difficult for the horses, on account of the number of fissures in the glaciers.

In Bushia, which we reached two days later, on the 25th August, we met with a very cordial reception from the inhabitants, and got horses, yaks, sheep, and provisions, on the promise of payment in Pumgal.

These people—half-nomadic Tartars—appeared very honest, and the prices they asked were certainly moderate. They inhabit caves, fitted up like houses in the cold season, and tents during the rest of the year. The height of Bushia is 9200 feet. We had taken the precaution of dressing ourselves like the inhabitants, and had also learned the necessary forms of salutation, for the people here are far from being savages, but are, on the contrary, very ceremonious. They took us—never having seen any Europeans—for what we represented ourselves to be—merchants from Delhi. Elchi, the capital of Khotan, was only two days' journey distant, but we found the people very reluctant to accompany us thither (for they feared the Chinese soldiery stationed not far from Bushia); besides the

time was far advanced for our intended tour in Cashmir. The distance from the northern foot of the Kuen-luen was one and a half day's journey. Already at Bushia the Alpine character of the central Kuen-luen had disappeared, the height in the environs of Bushia not exceeding 11,000 feet. We left Pumgal on August 29th, and followed, for three marches, the valley of the Karakash river, which flows from Pumgal to Suget in a westerly direction, then takes a sharp turn to the north, and then flows for the most part in an east-north-easterly direction. We met on this road with very large quarries and mines, from which is dug the Yashen stone, and which are resorted to by people living at great distances. We were enabled to procure, for future analysis, a good supply of this stone, which is very much valued throughout Central Asia.

Suget, a halting-place on the winter-road to Yarkand, is six ordinary marches distant from Karakorum; from Suget to Karakash, another town of Khotan, is six marches.

After due deliberation, we started, on the 1st of September, with Mohamed Amir and only two laden horses, leaving everything we could do without, including our little tent.

Some instruments, blankets, furs, and provisions were all our baggage.

We succeeded in making in twelve days about 220 English miles across the central parts of the Kuen-luen (25 marches of the Russian itinerary route from Yarkand to Leh). We reached Leh in the evening of the 12th of September. The country between Suget and the Karakash Pass was new to us; we had here a very good opportunity of examining the plateaus above mentioned and determining the mean elevation. We had also, before we reached the Pass, a very extensive view of the highest central peaks, which we tried to draw on the scale of 1 degree to 1 centimetre.

From this point we wished to follow the Shayuk river, as the route would have taken us through country new to us. We also met, amongst many others, a caravan with fourteen dromedaries, not unfrequently used for carrying loads on the Yarkand road; they are the produce of a singular cross between yaks and kiangs (*sic*), and inhabit heights of 16,000 to 18,000 feet. We succeeded in getting two of them (remarkably docile animals), expecting to find them particularly useful in crossing the frequent rapids in the Shayuk river, as well as the glaciers and rocks so common in these parts. But, notwithstanding the height and power of these animals, we found it impossible to go down the Shayuk valley. The river had much subsided, compared with its height when we crossed in the

beginning of August, but it was still far from passable, as it is from the end of October to the end of March.

We were obliged, therefore, to leave the road down the Shayuk valley at Sultan-Chushun, and go up the valley to Sassar, and from thence follow our old route. We had to cross the Shayuk river, not without difficulty, five times in one day before we reached Sassar. During our absence from Leh, our native doctor Shir-kishin had made meteorological observations, and—what was especially valuable to us—detailed barometric and magnetic observations; had completed a plan of Leh, 11,000 feet, the chief points of which had been laid down before our departure; and had sent collectors to different parts of Ladák to complete botanical and geographical distributions. We found all our orders had been carefully executed.

Our horses and luggage left behind at Suget, not arriving for thirteen days after us, Sept. 25th, we had time, besides finishing our plans and drawings, to make numerous casts in plaster of Paris* of individuals of different tribes, as we had already done in different parts of India and the Himálayas.

The PRESIDENT expressed the thanks of the Society to Colonel Sykes. The brothers Schlagintweit were well known to geographers and naturalists for having distinguished themselves in the survey of the Alps, and in various communications published in Germany. Baron Humboldt had always had the highest estimation of their capacity and talents. They were now employed in surveying, under the patronage of the East India Company, those distant regions into which few travellers had been. The paper contained evidence of talent, and he had no doubt there were some valuable observations with respect to the mineral springs of the country, an important point in the geographical feature of that region. It was a point to which Baron Humboldt called attention that the Kuen-luen was of volcanic origin, of which these hot-springs were the only active remains.

MR. W. J. HAMILTON, F.R.G.S.—Although he had no knowledge of the country itself, he could not resist rising to express the satisfaction with which he had listened to the communication. He had the pleasure of knowing these distinguished German brothers previous to their departure from this country, and it was with the greatest satisfaction he had listened to the statement of the progress they were making in the investigation of the physical features of this interesting district. From the opportunity which he and many members of the Geological Society had of appreciating the talents, energy, and zeal of these travellers, he was sure they might look forward to receiving much valuable and interesting information from them. The extracts which had been read contained but a small portion of the information which they had sent home. When the whole paper was published, he had no doubt it would be found to enter into many interesting details on other points.

* We were obliged to H. Longden, Esq., superintendent of the 'Secundra Press' at Agra, for a very precious supply of plaster of Paris when our own stock was nearly exhausted.

4. *On Trinidad and the Orinoco.* By Lieut.-Col. J. SMYTH O'CONNOR,
F.R.G.S., Governor of the Gambia.

AFTER a brief sketch of the history of Trinidad, alluding to its discovery by Columbus, to its conquest by an English force under Abercrombie in 1798, and to the most distinguished of its subsequent Governors, the natural features, products, and resources of the island were described. The commanding situation of Trinidad, with reference to the navigation of the great river Orinoco, and the productive character of the countries on the banks of that stream, rendered it remarkable that no efforts had been made to establish steam-communication through that important channel between Trinidad and the interior of the South American continent. Horses, cattle, wheat, and produce of all kinds and of the finest quality, can be raised on its banks; while its navigable waters offer great facilities for disposing of English manufactures in the interior, reaching westward nearly to the capital city of Bogotá, and southwards within a short distance of the navigable Rio Negro, a branch of the Amazon.

In conclusion, the proposal of Admiral Elliot to explore the Orinoco, to ascertain the extent of its navigable waters and the means of connecting them with the navigation of the Amazon, was strongly urged by the author, as a matter of great importance to English commerce, particularly in connection with Trinidad.

The PRESIDENT thanked Colonel O'Connor for his communication respecting the advantages to be derived from a farther exploration of the Orinoco, with reference to the very fine colony which he had described in such a graphic manner. Colonel O'Connor had followed up the proposition of Admiral Elliot, and he was sure if the recommendation of the Geographical Society was communicated to her Majesty's Government, that something would accrue to the advantage of science, and he should hope to the eventual interests of the country. He had hoped also to have received a communication from Baron Humboldt, to whom he wrote about ten days ago, explaining that the Society had had one communication, and were about to have another, on the importance of opening up the navigation of the Orinoco. Perhaps the communication would come on a later day, and that he should be able to read it at a subsequent meeting. The Government had decided to make a mineral survey of the West India isles. As Superintendent of the Geological Survey of England, he had been directed by Her Majesty's Government to appoint two gentlemen to make this survey. Trinidad would be the first, and he trusted the result would show the importance and value of that colony.

PROCEEDINGS
OF
THE ROYAL GEOGRAPHICAL SOCIETY
OF LONDON.

SESSION 1857.

Seventh Meeting, February 9th, 1857.

SIR RODERICK I. MURCHISON, PRESIDENT, in the Chair.

PRESENTATIONS.—*Captain John Baillie, Bengal N.I., was officially introduced upon his election.*

ELECTIONS.—*Lieutenant Wm. Chimmio, R.N. ; Dr. Robert Dobie, R.N. ; Henry S. Keating, Esq., Q.C., M.P. ; Capt. Henry Yule, Bengal Engineers ; and J. M. Airey ; J. B. Brasted ; Dalton F. G. Dalton ; John Gulchrist, and John Stuart Glennie, Esqrs., were elected Fellows.*

DONATIONS.—Among the donations to the Library and Map-Rooms since the former meeting were—‘Minutes of the Committee of Council on Education, Downing-street ;’ ‘Werne’s Expedition to Discover the Sources of the White Nile,’ presented by Mr. A. S. Twyford ; ‘Memoir on the Euphrates Valley Route to India,’ by Mr. W. P. Andrew, F.R.G.S. ; ‘Report on the proposed Railway between the Danube and the Black Sea,’ presented by Mr. Lewis Gordon ; ‘Annales de l’Observatoire Physique Central de Russie,’ presented by the Minister of Finance, St. Petersburg ; ‘The Atlantic Neptune, for the use of the Royal Navy,’ presented by Mr. W. B. Webster.

EXHIBITION.—The President called the attention of the Fellows to a marble bust of his eminent friend and associate the late George Bellas Greenough, Esq., former President of the Society, executed by Mr. Burnard, as ordered by the Council.

The Papers read were :—

1. *Notes on the Route from Bushir to Shiraz.* By Lt.-General W. MONTEITH, F.R.G.S., etc.

[As this Memoir will be published in the Journal, the following is merely a brief allusion to some parts of it.]

GENERAL MONTEITH thought the Passes between the two places to be less formidable than generally believed. He had repeatedly

traversed and examined them. No doubt there were many and serious difficulties to be met with in the shape of deficiency in quantity, and indifference in quality, of the water in many places, the difficulty in crossing the ravines, and such-like obstacles; but he thought that in neither of the two great Passes were there insurmountable obstacles to conveying an army through them. There were a number of tribes in the various districts along these Passes; but he believed upon the whole they were rather friendly inclined than otherwise. The great force of the province of Fars consisted of the ancient Persian tribes, the assembling of whom by the Government would be attended with considerable danger, as it would be uncertain which side they would take.

The PRESIDENT, in returning thanks to General Monteith for his communication, reminded the Society that General Monteith was one of their earliest Associates. He might tell them that in the year 1831, almost immediately after the establishment of the Society, General Monteith produced before them a map, which had been subsequently published, relating to the north-western districts of Persia, and particularly to the Caucasus and Armenia. As this distinguished officer accompanied Sir John Malcolm in 1810, and was nearly twenty years in the country, and as he had been an eye-witness of all that he related, he (the President) need not say that his account was to be relied on. His recent work on Erivan and Kars was well known. He had been with both the Persian and Russian armies in the campaign of 1824; and also with Prince Paskievitch in the Erivan campaign. He, the President, was happy to observe among the Fellows present so able a commentator on Persia, as Sir Henry Rawlinson,—one who was so capable of giving a lucid explanation of the geographical features of Southern Persia, and who he hoped would be induced to extend his observations also to other parts of those regions, and to diversify the subject by allusions to the great historical events of antiquity.

2. *Observations on the Geography of Southern Persia, with reference to the pending Military Operations.* By Col. Sir HENRY C. RAWLINSON, K.C.B., F.R.G.S., etc.

SIR H. RAWLINSON. — Before proceeding to offer any observations on the geography of Southern Persia, I think it proper to explain that I wish these observations to be understood as applying to a purely scientific and geographical subject. This is not the place nor the occasion, to enter into any political disquisition. I beg it to be understood, that in describing the geography of the country, in which the now pending military operations are being carried on, I offer no opinion as to the justice or the expediency of the Persian war. As a geographer, I am content to take the commencement of that war as a "*fait accompli*;" and I hope soon to be able to include the termination of it in the same category. The expedition, as you are aware, on leaving Bombay, proceeded first to

the Persian Gulf. This Gulf in olden times was called the Erythræan Sea. I shall not fatigue you by going into the details of the ancient history of the country ; but I may just mention that this name of Erythræan Sea recalls many associations of great interest. The Red Sea of Egypt and the Persian Gulf were both called the Erythræan Sea, or Red Sea, not in allusion to the colour of the water, as has been sometimes supposed, but rather as "the sea of the Red Men;" for those Erythræans, or "Red Men," who inhabited equally the shores of Abyssinia and of the Persian Gulf, were a great Hammite race—the same which founded the kingdom of Nimrod in Babylonia, and to which belonged the Æthiopians of both Africa and Asia. These people, wherever they were found, were called "Red Men," having thus the name of *Erythræans* in the Persian and Arabian Gulfs, of Phœnicians on the shores of the Mediterranean, of Idumeans in the valley of the Euphrates, and of Homerites in the south of the Peninsula ; for all these names have the same signification of "Red;" and thus the tradition is explained, that Phœnicia was colonised by the Erythræans: they are, in fact, the same people. We have indeed many proofs of this identity, which I shall be able perhaps to notice as I proceed to explain the actual geography of this famous sea. Probably the first point which will interest you, is a notice of the scenes of the recent expedition from Bombay. I have here a small plan—an amplification of a chart of Bushir and the surrounding country—for which I am indebted to Colonel Sykes. This chart shows you the country where the troops landed, and through which they marched from Hallila Bay to Bushir. The most interesting and curious matter connected with the march is this, that the very point where the British troops first came into collision with the Persians—a place which will ever be remembered as the scene of a great victory of our troops, and where so many gallant officers fell—that spot happens to be the most important in point of antiquarian and historical interest of any place in the whole Persian Gulf. At this very spot indeed existed in antiquity, the great capital of the race which ruled in the Erythræan Sea. The remains of a city are still to be seen there ; and from its ruins I produce here an actual fragment, a brick from the Temple of Tirhakeh, the great king of Æthiopia, who was contemporary with Sennacherib. There are many specimens of the same class in the British Museum ; and this particular brick was sent to Col. Sykes. I have written a few notes upon this place, Rishir, which probably you will allow me to read :—

"In remote antiquity it must have been a place of much importance, for numbers of bricks, impressed with cuneiform legends, have

been dug up in the immediate vicinity, belonging to the Cushite or Æthiopian race, who also held the neighbouring province of Khuzistan, and whose bricks are commonly found at Susa. Upon these bricks are found the legends of *Sutur Nakhunta*, contemporary with Sargon of Assyria, and *Kudur Nakhunta* and *Tirhakeh*, contemporary with Sennacherib. There are so many points of connexion at this period between the Æthiopians of Africa and the Æthiopians of Asia, that is, between Meroe and Susa (such as the identity of the traditions referring to the two countries, the double Memnon, double Cepheus, &c.), that I think it by no means impossible the Tirhakeh of the Erythræan Sea, whose bricks are found at Rishir and Susa, may be the very king of that name, who is mentioned in the Bible and in the cuneiform annals of Sennacherib, as having invaded Syria from Egypt, and having fought with Sennacherib, while that monarch was engaged in his famous campaign against Hezekiah of Judæa. At any rate, the kings had the same names; they belong to the same period of history, and ruled over divisions of the same race. And if the geographical distance of Meroe from Susa and Rishir be thought to be fatal to the identification of the two Tirhakehs, I would quote the nearly parallel case of the Imaum of Muscat, who at the present day holds Kishm in the Persian Gulf, and Zanzibar on the coast of Africa.

“ Under the Achæmenians we are unable to ascertain the name of Rishir. The metropolitan city of this period, in the vicinity, was Taoke, or Dalakee, where there was a royal palace of the Persian kings, mentioned by Strabo, Arrian, and Ptolemy; and the port of this city was at the mouth of the Granis, either at Bunder-Rig, or at what is now called Rohilla Point, extensive ruins being found at both of these spots at the present day. (*Yacut* notices these ruins south of Genava, and applies to them the name of Shiniz, which, however, generally denotes a place at the mouth of the Tab.)

“ Under the Sassanians, in about A.D. 230, Ardeshir Babegan rebuilt the two cities of Taoke, or Toug, and Rishir, and called the one ‘Ram Ardeshir’ and the other ‘Riv Ardeshir’—that is, ‘the rest of Ardeshir,’ and ‘the delight of Ardeshir.’ Riv Ardeshir became corrupted into Rishir, which has applied to the ruins of the city ever since.

“ During the third and fourth centuries, Riv Ardeshir was the seat of the Christian metropolitan of Persia; and Johannes of Rishir, who sat at the Nicene Council in 325, is said to have had ecclesiastical jurisdiction over all the churches both of Persia and of India.

“ At the time of the Prophet, Shahrek, the Marzaban or ‘Lord of

the Marches,' a Magian chief, held all this part of the country; and the Arab historians describe his conquest by El Hakam el Thakafi, who was sent by Omar from Bahrein, to reduce the sea coast of Persia. The two battles, by which Shahrek lost Toug and Rishir, are described in detail; and the latter engagement is said to have been not less bloody than the famous field of Kadissieh."

Now, that is the history of Rishir in antiquity—of a ruin which has passed almost unnoticed up to the present day, and has only been called into prominence by the recent operations. I have given you a brief, though continued history of it from the time of Tirhakeh, the great Æthiopian King, down to the Mahommedan conquest. After that period, the place fell into ruin, and it is rarely mentioned by geographers, until about the year 1500. In 1520, I believe, it was repaired and rebuilt by the Portuguese. The fort which the enemy occupied on the recent occasion, and which is called the Portuguese fort by us, is, I believe, one of the very old works. It is called in the country, generally, "the Fort of Nebuchadnezzar," and it is always noticed in the Persian gazettes as the "Fort of Bahmen," who was a King of the old Dynasty.* The Portuguese restored this fort, but the name they gave to it, I have never been able to discover; it was probably, however, a real Portuguese name; at the present day it has recovered its old name of *Rishir* (or *Riv Ardeshir*), and perhaps dates from the time of Tirhakeh, the Æthiopian King.

I must now return to the more important subject of the actual geography of the gulf. From the earliest times, the Persian Gulf has been of much consequence, owing to its position upon the great line of communication between the east and west; that is between India and Europe. There have thus been in the Persian Gulf, a succession of *emporìa*, places where the commerce of the gulf was concentrated, and which varied in situation according to circumstances. The earliest port, as far as I have been able to discover, was situated at the mouth of the Euphrates. That was probably anterior to the Persian Empire, before, I mean, the Empire of Cyrus the Great. When the empire of Cyrus was instituted, and Persepolis became a great capital, then the city at the mouth of the river

* By the name of Bahmen the Persians indicate *Bahmen Ardeshir*, or Artaxerxes Longimanus; but it is probable that in adopting this nomenclature they have confounded the two Ardeshirs, referring the tradition of *Ardeshir Babegan*, who really rebuilt *Rishir* in about A.D. 240, and named it *Riv-Ardeshir*, to the more ancient Bahmen Ardeshir or Artaxerxes Longimanus, who lived in the fifth century B.C. An instance of the very same confusion occurs in the vicinity of Mohamrah, where the city known to the Greeks as *Χαρχή Σααρίου*, and rebuilt by *Ardeshir Babegan*, who gave it the name of Asterabad, or *Kerkh-i-Misan*, received after the Arab conquest, the title of *Bahmen Ardeshir*, now corrupted to *Bahmishir*.

Granis soon rose into importance, as the port from which all the supplies of merchandise came into the country.* At the time of Alexander's eastern campaign, we find mention made of Mesambria, which is probably Bushir, and of the river Rhogonis, which is the same as the Genava.† There were emporia probably at both of these spots. In later times, the time of the Mahommedan conquest, the great place was Siráf. This place, Siráf, continued to be the emporium of the Gulf for a long period,—indeed, probably four or five hundred years,—but the site has been improperly laid down in the maps.‡ Then, the emporium was moved to the island of *Keis* or *Kenn*. After *Keis* was ruined, the great emporium was at Ormuz on the main land; and when that was destroyed, it was removed to the island of Ormuz. This place, the island Ormuz, was taken possession of by the Portuguese in 1519, and for above 100 years it was the entrepôt of all the commerce between the east and west.§ In 1625, the East India Company sent three officers, Captains Bligh, Weddell, and Monoxe, with a considerable fleet to assist Shah Abbas in driving out the Portuguese. It was during this expedition that the famous navigator Baffin, the discoverer of Baffin Bay, was killed at the bombardment or siege of a place on the neighbouring island, the town of Kishm, from which the island

* The name of the city at the mouth of the Granis is not given by Arrian; but *Táins* is mentioned some way up the stream, as the site of one of the royal palaces; and both Strabo and Ptolemy confirm this statement. Now *Taoke* is of course the *Toug* or *Touj* (ترب or نرج) of the Arabic geographers, immediately at the foot of the mountains on the road from Shiraz to Genava; thus exactly answering to the position of the modern *Dálaki*, and leading to the inevitable inference, that the mound on which the present fort is built, covers the ruins of the old Achæmænian palace. The *Dálaki* river, or *Granis*, formed of two arms, which unite before it leaves the mountains, again bifurcates as it approaches the sea, one arm falling in at *Rohilla Point*, and the other at *Bunder-Rig*. There are extensive ruins at both of these places, probably of the Æthiopian period; but it is at *Bunder-Rig*, I think, that we must look for the *Shiniz* of *Yacut*, a very ancient site south of *Genava*.

† *Aru-guna* (i. e. *Ῥώγυνος*) in Hamite Chaldee, and *Gumáva* in old Persian, signify the same thing, "the river of *Guma*." The Arab geographers usually write the name جنابه *Jenâbeh*; but the old pronunciation of *Gonava* is now alone known in the country. It is just opposite to the island of *Khary*, or *Karrack*.

‡ The error of placing *Siráf* to the south, near Cape Sertes, originated with Sir W. Ouseley, who confounded the name with that of *Shindás*. The real *Siráf* is now called *Shilau* (an older form of the same name, probably meaning "a torrent" or "full stream") and is close to *Tuwré* (properly *Tâhîrî*, from its founder *Tâhîr*), and not many miles from Congoon. Morier describes the antiquities of the place, and its cuneiform bricks, on the authority of a naval officer who had visited the ruins. It should be well examined during the present expedition.

§ The *Ῥομαϊστία* of Arrian is Ormuz, on the mainland. The island he calls *Ῥογάνα*, which is probably the same as *Gerûn*, altered by the Arabs to *Jerûn* (جرودن).

has its modern name.* The Portuguese after a short siege were obliged to capitulate, and Ormuz was taken possession of by the united British and Persian force. In consequence of this exploit, Shah Abbas gave privileges to the British government which we retain to the present day; in fact, it is owing to the assistance rendered by us in the taking of Ormuz, that we have the right of possessing a residency at Bushir. Shah Abbas, in the first instance, permitted us to have a factory at Gombrun, or Bunder Abbas, opposite Ormuz; and this remained until about 100 years ago, when the establishment was transferred from Gombrun to Bushir, and early in the present century, the Factory was exchanged for a Residency. It is quite impossible to give now a detailed description of every place along the coast from Ormuz up to Bushir. All I can do is to explain generally that the sea-board of the Persian Gulf consists of a belt of low land, with mountains at a short distance from the coast, varying from ten to thirty miles, seldom more than thirty, and seldom less than ten. At Bushir, the distance is about twenty-five miles. This low land between the mountains and the sea is arid, badly-watered, containing no trees, except date-trees, and inhabited by Arabs. It is altogether a very unpromising country. The hills ascend abruptly at about thirty miles inland, and are intersected by numerous valleys watered by mountain streams. These valleys are beautiful spots, filled with lovely gardens, and inhabited by fine mountain tribes, who are probably the best class of men among the whole Persian nation, whether considered in regard to bravery, honour, or fidelity. At the northern extremity of the Persian Gulf, the mountains recede more to the northward, leaving a large tract of country which is entirely plain, and which was formed originally by the alluvial deposit of the large rivers that here descend from the mountains. This tract of country is extraordinarily rich, and quite different in character from the belt of low land in the neighbourhood of Bushir. It is an alluvial soil, admirably adapted to cultivation, while the other tract is a mere barren, sandy desert. If it should be necessary—which of course we all

* Arrian names this island, which was said to contain the tomb of the Eponymous hero, King Erythras, *Οἰκιστὴν*; and the title remains to the present day, under the scarcely altered form of *Vroct*. The name is, I suspect, Hamite Chaldee, signifying "the separated," or "broken off," in allusion to the natural convulsion which divided the island from the main in remote antiquity, and the tradition of which has been preserved by Justin (from Trogius Pompeius) in his description of the migration of the Erythraeans from the Persian Gulf to colonize Phœnicia. The Arabs named the island *Laft*, from a town of that name which still exists at the back of the island, and *Ibn Gáwan*, بن عاون, from the tribe which settled there.

hope it will not be—to continue operations in the Persian Gulf, it is only natural to suppose that we shall turn our attention to the particular part of the country I am now noticing; and I may as well, therefore, explain to you something of its geography, commencing with the mouths of the river Euphrates and the surrounding delta. You are aware no doubt that, according to the intelligence we have in the public papers, there is another division about leaving India at the present time, and I am thus betraying no confidence in alluding to the probability that this division may be directed to disembark at Mohamrah, which is the only other Persian port of any consequence on the gulf. If I may judge from the admission of an influential journal, of its ignorance of the position of Herat, the English public would seem to be not very well up in geography, notwithstanding the efforts of this Society to spread a knowledge of that interesting science. It can hardly be questioned, however, that we are improving. A few years ago we had very little acquaintance with Balaklava, or Kertch, or any of the Ports, either in the Sea of Azof or on the coasts of the Black Sea. Now, they are all household words. In the same way we know very little at present about Bushir, or the place to which I am about to introduce you, Mohamrah, but it is very possible that before long they will also become household words with us. I must commence then by explaining that Mohamrah is Persian soil. Upon this map, the frontier between Persia and Turkey is not laid down at all; and in most of the maps where the frontier is laid down, it is done incorrectly. The real line of frontier between the empires, not only as it exists at present, but as it is confirmed by the treaty concluded at Erzeroom under the sanction of England and Russia, comes down to Mohamrah, and then follows the course of the river Euphrates to the sea, so that this island named *Abadán** is Persian. I should here perhaps repeat the statement which I made to this Society on a previous occasion, much to the surprise of the President, that all this country is quite new, within comparatively recent times. We can indeed historically trace its formation mile by mile. The great city of which the ruins are to be seen above Mohamrah was an island

* The island of *Abadán*, lying between the *Bahmishir* (properly *Bahmen Ardeskír*) and the *Shat-el-Arab*, or the two streams which form the delta of the Euphrates, answers to the Southern Mesene of the Greeks, and the *Misán* of the Arabs and Talmudists. The name in the inscriptions of Sennacherib, which has been read *Khupapan*, ought, I think, to be pronounced *Hubadan*, the same as the *'Abadan* of the Arabs, and *'Αφφάδων* of the Greeks. The early Persians named the island *Miyan Rudan*, "between the rivers," evidently after the Greek *Μεσίνης*, from which term also the Oriental *Misán* was probably derived; for the title is unknown in the ancient inscriptions, and has no meaning in the Semitic tongues.

in the time of Sennacherib, named *Bīllat*.^{*} It was an island even up to the time of Alexander, being mentioned in the history of that period under the names of Aphle and Apollogos. As Obollah on the sea coast, it became the great entrepôt, under the Sassanians and the early Arabs, of the commerce running up the Euphrates. Now, it is sixty miles from the embouchure of the river, and we can trace a succession of cities below it, along the river, down to the sea. It would seem indeed, that every two or three hundred years, a new city was founded on the sea shore, that it was then left dry, and the people were obliged to desert it and form another port lower down. In continuation of this subject, I may mention that along the whole of the sea coast, from the mouth of the Euphrates to the mouth of the Tab, there is a series of extensive sandbanks, which will all become dry land in the course of a few years. The reason of this change is again quite evident. It is not merely the simple physical process that we observe in other countries, namely, that the river water coming down charged with alluvium, and meeting the tide, deposits the matter that it holds in solution; but there is in the Persian Gulf an additional cause of deposit. There are indeed but two winds, either the north-west blowing down the valley of the Euphrates, or a strong south-easter blowing up in the face of it. When the wind blows down, there is of course no deposit; but when it blows up, which it often does for days together and with great violence, it then brings the whole force of the sea directly against the current of the Euphrates, and an enormous deposit naturally takes place. That deposit is going on yearly; and, undoubtedly, in a few hundred years, the mouth of the river will have extended out very much farther than at present. According to my calculation, the increase is about a mile in thirty-five, or in less than forty years. It is very doubtful if, what is now called the mouth of the Euphrates, be the true mouth of the river. The true mouth of the Euphrates, I myself believe to be, what is now called, the *Bahmishir*, and that which is at present, the mouth of the

* The ruins of Obollah, which was a place of great importance at the time of the Arab conquest, and which may very well be supposed to represent not only the *Bīllat* (the *t* is the mere feminine termination, and was probably dropped in pronunciation) of the cuneiform inscriptions, but the Aphle and Apollogos also of the Greeks, are to be seen on the right bank of the Euphrates, about two miles above the mouth of what our sailors call the Haffar or Mohamrah Creek. The name, however, of Obollah is now lost. The site is of much interest to Indians, as the place whence the Chaldeo-Persian colony emigrated on the approach of the Arabs under *Khaled*, and sailed for India, carrying with them books, like the *Bundehesh*, written in a language that we call Pehlevi, but which is in reality the vernacular dialect of Southern Chaldæa in the seventh century. The colony landed at *Sindhu*, in Guzerat, now called St. John; and the Parsees of Western India are their direct descendants.

Karún. You have lately heard from Mr. Loftus, some interesting disquisitions upon that river. I have only to observe, in reference to it, that, if we were to occupy Mohamrah, and if there was any occasion to press farther upon Persia, then the natural course would be, to ascend the Karún into the open country of Susiana, instead of attempting to mount the impracticable passes between Bushir and Shiraz, which have been described in General Monteith's paper, and which I venture to say, are not to be forced by any army in front of an enemy. With respect to the physical geography of these passes, I consider General Monteith's description to be very accurate. When I saw them first, and still more when I first ascended them, I thought they were quite impracticable to any army; but after having been a good deal about Persia, and having taken guns up passes still more difficult, both there and in Afghanistan, I was satisfied as to the possibility of conveying artillery anywhere—provided there is no opposition. By putting a regiment to a gun, you may drag it anywhere by sheer force—up the Himalaya or the Andes;—and you may thus, of course, take it up these Persian passes; but the operation is not to be attempted in front of an enemy. I observe that Mr. Rich, a very good geographer, has the same idea that I have, as to the passes on the route to Shiraz. He says the roads in Persia are bad, but not nearly so bad as in Kurdistan; that the passes between Bushir and Shiraz are bad, but the passes between Senna and Sulimanieh are much worse. There is no occasion, however, I conceive, to attempt to force these passes. Another mode of attack would be far less difficult and equally, if not more, effective. The whole country to the north of the Gulf is perfectly open. The river Karún from Mohamrah is navigable almost up to Shuster; one of our steamers, indeed, has already made the ascent. Of course, at that time the steamer went up for the mere prosecution of geographic science, and without the slightest expectation that the knowledge obtained would ever be turned to political account; but I see that we do not get credit for disinterestedness; on the contrary, in a paper which was published in the last number of the "*Revue des Deux Mondes*," there are statements from which it would really appear, that the continental nations are disposed to think, that all our previous explorations, and travels, and wanderings in Persia, have been undertaken for the express purpose of preparing for this present war. I find it stated, indeed, that a friend of mine, whom I am glad to see present (Mr. Layard), and who at that time was travelling about the Persian Mountains for the purpose of copying inscriptions and acquiring geographical knowledge—I find it stated that his travels were carried on at the expense of Govern-

ment, and for the express purpose of maturing the plans which are now being carried out. He is not mentioned by name, but is described in a manner which leaves no doubt of his identity. Now it so happened that while this gentleman was exploring the Bakhtiyari mountains, a steamer was going up the Karún at the same time, for the purpose of executing a survey of the river, and accordingly these two facts are put together in the paper alluded to, and it is inferred that this country must have been laying those plans fifteen years ago, of which we have the consummation in the present Persian war. Such is the consolation we get for our geographical ardour, and our desire to communicate our knowledge to the world.

To return, however, more particularly to the Karún :—the passage of our steamer up the river was no doubt of great use in showing us the navigability of the stream ; but if it ever should be necessary to pass up the river into the interior, it is not to be supposed that one steamer, or two steamers, or half-a-dozen steamers will be sufficient to meet the requirements of the expedition—the invading army must, of course, march along the banks of the river, merely trusting to the flotilla for the conveyance of its stores and ammunition, and in ten days' march from Mohamrah it would reach the town of Shuster, which is situated in one of the best supplied districts in the whole of Asia. The town of Shuster moreover is extraordinarily strong in a military point of view, being defended on two sides by a great river, and with a wall and ditch at the base of the triangle leading from one river to the other. It is altogether one of the strongest military positions that I remember to have seen anywhere. The whole tract of country between the two rivers, is farther admirably irrigated, and is in fact one vast expanse of garden and cultivation. The only drawback that would be met with is the heat. In summer time the place is almost as hot as Bushir itself, although by no means so unhealthy, since at Bushir, it is not so much the heat as the humidity which creates unhealthiness, while at Shuster the climate is singularly dry. Should a British army, however, be encamped at Shuster, it must be understood that they will merely have the command of the country below the mountains. That alone is an important position. It would certainly be of great political importance to hold a province of this extent and richness at our command ; still we must be careful not to run away with the idea that, because an army has advanced to Shuster, it is in a more favourable position for operating on Tehrán, than it was in at Bushir. It is in fact, all but impossible to penetrate into the interior of the country from Shuster, that is—

for an army to advance with all its supplies and materials of war. I have on different occasions traversed most of the passes which lead from the low country to the interior of Persia, and the only road which is practicable for guns, without extreme difficulty, is the pass on the high road from Bagdad to Kermanshah, and even that pass is far from easy. It was anciently named "The gates of Zagros," and is now called the pass of *Tak-i-Gerrah*, from an old Roman arched toll-house on the ascent of the mountain.* In the south there is a pass leading from Siráf to Shiráz, but Captain Lynch is I think the only English gentleman who has ascended it, and I am not aware that any account of it has been published. The two passes described in General Monteith's paper are both execrable, and the southern pass by Firozabad also suffers from want of water. Then, again, in the country of Susiana there are footpaths leading up the mountains in many directions along which several English travellers have passed, such as Mr. Layard, Mr. Loftus, and myself, but these are mere paths; they are not roads practicable to artillery; the only military route by which the mountains can be ascended from Susiana is along the valley of the Kerkha, but in that case the circuit is enormous. You have to follow the river almost as high up as Kermanshah, in order to get through the mountains and come out upon the plateau of Iran. I have myself taken guns by this route from Shuster on to the plateau at Kermanshah, but of course unopposed; and I do not think I could have ascended the passes in the face of an enemy. Having thus given a general description of the passes, of the rivers, and of the sea-coast, the only subject which remains to be noticed by me, in reference to this part of Asia, would seem to be the inhabitants. I mentioned before that the coast-line—the belt of low land that is along the coast—is exclusively inhabited by Arabs. Beyond them, towards the interior, you have warlike Persian tribes inhabiting the mountains. Immediately above Bushir, the Mame-

* *Tak-i-Gerrah* means "the arch holding the road." The present building probably dates from the time of Gotarzes or Vologeses, when the Parthian kings were supported, and even nominated from Rome, and is certainly of Western architecture. In earlier times the body of Molon, the rebel satrap of Media, was here erected on a cross by Antiochus.

The name of Zagros has long been a puzzle in geographical etymology. Remembering, however, that the inner face of the mountains is throughout the range named *Pasht-i-koh*, or "back of the hill," and that *Za-giri* has this exact signification in Skipetari, I cannot help suggesting such an explanation; and if it is asked what the Skipetari could have been doing in the Median mountains, I would point to the neighbouring city of *Holwan*, which is actually called Albania in the Peutingirian map, and has a nearly similar name in the Cuneiform Inscriptions; and I would further note the general use of the Arian term *Giri* for "mountain," throughout this part of Asia.

senni are the principal people, and they have hitherto been particular friends of the British. *Bákir Khan*, son of *Walee Khan*, the old chief of *Kileh Sufid*, has often been the guest of the Resident at Bushir. He is, I believe, at present the head chief of the Mame-senni, and in that capacity king of all the mountains, and accustomed to look to the English for assistance and protection against the Persian government. I once passed a day with *Bákir Khan* among the ruins of Shapúr, and was greatly pleased with him; he was indeed a general favourite with all Europeans who ever met him. He had been moreover in former days imprisoned by the Persian government, and consequently bore no good will towards them. Almost all these tribes, Persian as well as Arab, that is, the Mame-senni, the Dashti, the Tangistuni, are governed by chiefs who have been in habits of friendly commerce with us, and whom we know and esteem exceedingly; and I can never persuade myself to bring such men into the same category of national hostility with the officers of the Persian government; they have, in fact, no sort of feeling in common with the court of Tehrán. They are brave, honourable, independent men; and I do hope they will not be driven by the force of circumstances to become our blood enemies, like the chiefs of Afghanistan.* Above the mountains these war-like chiefs are to be met with in all directions; the chiefs of the Bakhtiyari, for instance, who are rough, wild fellows, but still much superior to the courtiers, artisans, and peasants whom you meet in the towns and villages. Some of them are very like the old Highland lairds, being able to bring into the field as many as four or five thousand men. Taken as a class they are, I should say, most estimable people. In the plains of Susiana the permanent inhabitants are Arabs; but the Lúrs come down also in the winter from the mountains to feed their flocks in the rich pastures of the Kerkha and Karún. The tribes to the north of Susiana, are wilder than the tribes to the south, and even more addicted to brigandage; but even they have their good qualities. I have not ventured to enter upon any details of physical geography, because, although there is a good deal to be said on that subject, the question of immediate interest refers rather to political geography. I may notice, however, before

* One instance of this change has already occurred which is greatly to be regretted, and which is ominous of future trouble. *Bákir Khan*, the old chief of the *Tangistunies*, was always on terms of intimacy with the British resident, and not unfrequently did good service to the British Government. His son, Ahmed Khan, however, on the occasion of the present invasion was driven into the ranks of our enemies, and fell at the head of his *Tangistunies*, when we stormed the old fort of Rishir. We are now, therefore, blood-enemies with this powerful tribe, for all time to come.

sitting down, that all the rivers running through the country of Susiana have at one time or other changed their courses. It was suggested, I think, by Mr. Loftus, on a previous occasion, that some of these rivers seemed to have formerly run in different beds; but I would go much farther, and undertake to prove historically that one and all the rivers have changed their courses, and that these physical changes have given rise to much political confusion. For instance, the original course of the river Karún was through *Guban* to the sea, and it was mainly owing to a great dam being erected at *Sabla* to raise the water of the river for the purpose of irrigation, that it came across and joined the *Bahmishir*. I am now speaking of later times; but Alexander is said, in antiquity, to have dug a canal from the *Pasitigris* to the *Euphrates*, along the line which has again recently become the river bed. The course of the Karún through *Guban*, was the original frontier between Persia and Turkey; but the river, having changed its course, is still regarded as the frontier, and the Persians, in consequence, have got a large accession of territory, to which they have no political right. If you refer indeed to the old maps, you will see that Persia has no right either to the *Guban* territory or to the *Island of Abadán*. I do not remember that I have anything further to state on the geography of this part of the country. I see many gentlemen present who have travelled over the same regions, and who possess, no doubt, much information on the subject. I shall be happy both to listen to them, and, if required, to answer any questions.

GENERAL MONTEITH, F.R.G.S.—I am not by any means so well informed on the subject as Sir Henry Rawlinson, but I was directed by Sir John Malcolm, in the first instance, to proceed to Shuster, to trace the river Karún, and particularly to visit the ruins of Susa. We marched by land along the shores of the Persian Gulf to Bassorah by *Rohilla*, *Rig Gunnowa*, *Hissar*, *Delim*, *Shebulsha*, *Endecan Mashúr*, and *Darak*, the capital of the *Chab Sheik's* territories; from thence traced the Karún to Shuster, and visited *Desful* and the ruins of *Susa*. Another object was to see by what routes the French, who were then expected to make the attempt, might advance on India. The principal route is that which Alexander is supposed to have followed. It leads from Shuster, through the valley of *Hormuz*, to *Persepolis*. There is a desert destitute of water for about eighty miles from the Karún to *Ram-Hormuz*. The people of the country have a tradition that a settlement from this place established themselves on the island of *Ormuz*, at the mouth of the Persian Gulf, which afterwards became so renowned for its wealth and commerce. I cannot say much for the road up the valley of *Hormuz*, leading through rice swamps, but the valley is beautifully cultivated. The passes there would be practicable for artillery with very little trouble, being only separated from the plain of *Babahoon* by a low range of hills. The celebrated pass, which was forced by Alexander, can be distinctly recognised about 10 or 12 miles from the *Kalai-sefid*. That *Kalai-sefid* I ascended, and remained there for two or three days. It is the most singular place I ever saw, and rises 1500 feet above the level, and abounds in springs all round it. An artificial

path has been cut, but it is so easily defended, that a small body of men could easily repel a large force. It was, however, taken by the Persians about twenty years ago. That was the last attempt made by the Persians to bring the tribes into some sort of order, for they are the greatest thieves in the world, plundering caravans, and everybody they possibly can. We were not robbed by them, owing to our strong escort of Persian troops. From this point there is a pass which would require to be repaired, and which would be forced without any great difficulty. Between this pass and Shiraz there is no great obstacle to be encountered. On returning from Bushir to Tehrân in 1820, I spent a month in examining the passes leading from Bushir to Shiraz, and thought them less formidable than they appeared to be. I had a good number of men with me, and I sent them up to the right and left to see whether these rocks, apparently inaccessible, could be gained, and I saw them in a short time crowning both sides of the pass. I took up twelve pieces of artillery; but with 500 men, and it took us three weeks to get them up. The plan I adopted, was to dismount the guns entirely and put them upon cradles made with trees. Twenty-four men to each gun, could only convey it a short distance; then they were relieved by others, and by that means we forced a way up the pass: of course that could not be done, if opposed, until you had crowned the heights. After passing the worst part of the first pass you could, by throwing a bridge across the ravine, reach a tract of country of much less difficulty. After passing through Konar-Tukht there is another pass, which descends towards Kazerûn: here there is nothing but stones, which could be blasted or removed. From Kazerûn you have a very strong pass, the Virgin's pass, which is carried almost up the perpendicular face of a steep hill; and the dilapidated condition of the parapet scarcely prevents cattle tumbling over. I followed the salt marsh down for about a mile, and saw a gap in the mountains which would require a bridge over the marsh. From that you get to the last pass, the Old Woman's pass, which is very steep but not very rocky, and a road could be made without any impediment. After that there is no further obstacle to Shiraz. I have only one thing to say as regards Chab, the country to the right of the Karûn. In my day it was governed by a chief who was nominally subject to Persia. His predecessor cut a canal for the purpose not only of irrigation, but of turning the navigation, and bringing the commerce of that part of the country into his own territory. Some creek or channel must have been navigable, for I saw within the walls of the city some of the largest vessels, although there was not more than three inches of water at the time, but it could be augmented by returning the water of the irrigation canals into its natural bed. The vessels were about 300 or 400 tons burden.

MR. A. H. LAYARD, M.P., F.R.G.S.—Mr. President, as you have done me the honour to call upon me, I may perhaps say a few words, more to verify what Sir Henry Rawlinson has stated, than to advance anything new on the subject. I quite agree with him, that if this war is unhappily to be continued, the site of our operations, at least of the position which our army must hold, must be transferred from Bushir to the upper country, on the banks of the Karûn, in the neighbourhood of Shuster. It is a very rich, fertile province, perhaps the richest of the whole of Persia. I am pretty well acquainted with the whole of that country, having resided there nearly two years; and as Sir Henry Rawlinson stated, I was not there with any evil designs. Indeed, I had not the remotest idea at that period that we should ever be engaged in warfare with Persia. The origin of my entering that country is principally attributable to the Memoir of my friend upon the site of the ancient city of Susa. Perhaps the best account I can give of it is to state shortly how I got there, which was not very easy at that time. My first intention was to penetrate through the centre of Asia; but at that period wars had broken out, and the roads were

completely stopped. Instead of remaining idle at Ispahán I resolved to penetrate into the Bakhtiyari mountains. I had spoken to Mahomet Shah on the subject. At the time I had been taken prisoner by Mahomet Shah, for we had broken off our relations with Persia. I asked for permission to go into the Bakhtiyari mountains. The Vizier said that it would not be safe, as the tribes were hardly under Persian rule; that if I went I should be killed. I pressed for permission, however, and he drew up a paper, which I had to sign, and in which it was stated, that if I had my throat cut, it would be my own fault. I started off from Ispahán, and made acquaintance with the chief of the Bakhtiyari tribe. I made his acquaintance in a curious way. General Monteith says the people are robbers: they are certainly very quick in taking possession of people's property. There was a Frenchman at Ispahán making drawings of pieces of sculpture. I had seen a capital, and I told him to go and draw it. He went on horseback to the spot, and, having dismounted, took his sketch with the bridle of the horse over his arm. He was so much occupied with his work that some person came behind him, slipped the bridle off, and took away the horse. When the Frenchman had finished he found his horse gone. We made inquiries and found that it had been taken by a Lúr. This led to my making acquaintance with the Bakhtiyari chief. He said he was going to return to his country; and finally, at his invitation, I returned with him. We crossed a high mountain by a difficult pass, and came to the castle of the great chief. He was a most enlightened man; and in the course of a few years, by his talent, determination, and courage, had subdued the whole of these mountains, and could bring some 23,000 men into the field. By mere chance, knowing a little of medicine, I cured his little boy of a fever; and I remained with the chief a long time. I found him so intelligent that I proposed many things to him; among others, that he should open the rivers, establish schools, and introduce commerce. When I left him and came down the Karún, sounding all the way with a string, as far as Karak, which was then occupied by British troops, I told Captain Henneh, who was then political resident, what the chief wished, with the view to establish commercial relations with that country; and, at the same time, I wrote to the Chamber of Commerce at Bombay on the subject. I went back to the Mountains, and while there, I am sorry to say, the Persians marched upon the tribes.

There has been a question about the practicability of these mountain passes for guns. It is true they are very difficult roads, and, strictly speaking, not practicable to artillery. They are only practicable in the way described by General Monteith. When I was at Susa, the Persians marched from Ispahán and crossed the mountains, bringing with them several guns and a large body of infantry. They were not opposed. I may mention, that all the tribes there live in tents; their life is very interesting and very pleasant. When the warm weather comes, they live on the highest tops of the mountains, among the glaciers and snow; and, as the weather becomes colder, they gradually descend the sides of the mountains, and get into the valleys in the winter. Thus they almost always enjoy perpetual spring, and always verdure for their cattle.

The road from Mohamrah to Susa is perfectly practicable for artillery, supposing the country were held. The road is not difficult, and the mountains are easily crossed; therefore, as far as Susa is concerned, there is no difficulty whatever. The only difficulty is to cross the range of the Zardeh Kuh; whereas, from Bushir to Shiraz, the whole country is one mass of mountains and difficult passes. In the part of the country to which I have directed your attention, there are only one or two passes, which are no doubt difficult, but they are practicable for guns, because the Persians carried theirs over. The Persians came down to Susa, and there they began intriguing among the tribes. Unfortunately, in Persia and Turkey the governing

authorities always have four or five chiefs, whom they play against the others. When one man is in the ascendant, they set four or five others against him. This is the way in which weak governments succeed in ruling over powerful tribes. There is no tribe in Persia equal in courage to the Bakhtiyari. When the Persians came to Susa they encamped. The tribes at first thought of attacking them, but the project was given up. The Bakhtiyari chief quitted his mountains, taking refuge amongst the Cháb Arabs, and came down to Fellahiyah. There a curious phenomenon took place. The Arabs destroyed the banks of the river about thirty miles above Fellahiyah, and by that means threw the water over the whole country, and made it an enormous lake. I then came down in a boat from Shuster to Ahwaz, with a party of what they call in Persia, Looties—dervishes and fellows who wander about, tear the skins of beasts, and play upon fiddles. When I got to Ahwaz, I found all my travelling companions were going to a holy place on the Euphrates, called Kerbula. At Ahwaz they began to make up their accounts, to see what money they had; when, finding that they had not a penny between them, they all began crying. I had a little money with me, about 5*l.*, which was all I had possessed for two years. However, when I searched my purse, I found all my money gone, and I was in the same condition as my friends; I had not a single half-penny; I had only a saddle with me. A Persian, seeing my difficulties, offered me five shillings for it, and I was obliged to accept it, and with that five shillings I hired a man and a mule to carry me across the country. When we reached the Fellahiyah river, we found that the Arabs had broken the banks and flooded the country. We got to a village towards the evening, and I found all the people preparing to go away. The mode they adopted was this:—In that country they have cottages made of reeds, and exceedingly pretty many of them are. They pull down these reeds, bind them together, make rafts of them, and float down the river to a place of security. In the night, my man, with his mule, ran away, and left me to my fate. In the morning, I found the villagers binding up the reeds and making rafts. I asked them to make room for me, but they refused; and they all went away, leaving me perfectly alone, surrounded by dogs and jackals, and other animals. I sat there some time driving off these beasts. At last I thought it better to do something for myself, bound some reeds, and made a raft, and in the morning floated down the river. It was very curious, like a scene in the 'Arabian Nights.' I floated down all the day, passing many of the rafts, and in the evening I came to a part where the river branched off into several canals. I went down one of these canals by chance, and presently I floated into the middle of a palace, in which there were a number of persons sitting round and smoking their pipes. The chief of the Cháb Arabs had built the house, and had carried a canal through it. I floated into the palace, and remained for some time with the chief, whose artillery I had the honour of commanding during the siege we sustained. At last, however, the Persian commander sent his relation, a Christian, with a Bible, and a great chief of the Mohamedan race with a Koran, and with this double shot promised the Bakhtiyari chief, if he would take the oath of allegiance, to send him back in safety to the mountains. The chief, not made wiser by the fate of his predecessors, went to the Persian commander, reassured by the presence of the Bible and the Koran, and was taken prisoner. I went with him, and was also taken prisoner; but I got away, and after that we had a long series of fights; and at last I lost all my friends. After wintering in the country four or five months, I at length quitted it. This sojourn there has given me rather a strategical knowledge of the country.

It is impossible to describe the beauty of the plains of Shuster, which form a perfect paradise at certain times of the year. At the end of February the rains cease, and, in a single day, the whole country is covered with a carpet

of grass. The change is marvellous. You go to bed with the country quite yellow, and awake in the morning to find it perfectly green. The grass increases until May, and gets so high that horses can scarcely make their way through it. After May, the heat soon dries up the grass; it disappears as rapidly as it grew, and the whole country becomes again a parched and barren desert. The heat in summer is so intense, that it is almost impossible to live there; and I doubt whether any European troops could exist there in tents. The inhabitants are obliged, the whole of the day, to live in holes under ground, whence at night they issue and sleep on the tops of their houses. For three or four months in the summer it would be impossible to live in tents; but at a short distance from Shuster there are what they call the "yilaks," or summer quarters. You have only to ascend a little, and you get into rich mountain plains, where the climate is delicious, and where you may pass the summer months in security, and get an abundant supply of cattle, sheep, and other provisions. The plains below Shuster produce almost everything; in fact, it is one of the most productive countries in the whole world. I hope that, whatever may be the evils produced by the war, some good will result from it, and that the country will be opened up to the enterprise of the British merchant. The inhabitants are not bad people. During the time I was in these mountains I used to go about, from one end of the country to the other, without an attendant. On one occasion only I was plundered; and even then the chief got everything back for me. It was a common saying at that time, that a man might walk from Shiraz to Kermanshah with his hands full of gold, without being touched. The people in the plains are exceedingly quiet: they are our friends, and have always been most desirous to enter into friendly relations with us. I can give you a curious instance of this. I went up to Shuster on one occasion in a steamer under Captain Selby. At that time the river was very high. As the current was exceedingly strong, we did very well so long as we kept in the centre of the river; but Captain Selby was desirous of keeping as near as possible to the sides, where the water was still or dead. We had been aground many times through the day, and at sunset we again got aground. The men had been working very hard all day, and the Captain allowed them to go to bed, thinking he would get the steamer afloat in the morning. In the morning, however, we found ourselves in the middle of a corn-field, twenty feet from the river, so rapidly had the water subsided. In this dilemma, as I knew the people, I told them that the English had brought a steamer up for them to see, and were so anxious that the people should see the whole of her that they had put her aground. The people came round in crowds to see her; but we remained there six weeks before we could move her. As a measure of precaution, we erected defences around her in case of attack. We took out the engines, and almost lost them; for as soon as we had taken them out, the water rose as suddenly as it had fallen, and we had considerable difficulty in getting them into the vessel again. I think, as far as the inhabitants of the country are concerned, that we have nothing to fear from them.

COLONEL SYKES, F.R.G.S.—At what time of the year was that?

MR. LAYARD.—I think it was in April or May.

THE PRESIDENT.—Will Sir Henry Rawlinson be so good as to offer some observations upon Herat?

SIR H. RAWLINSON.—I was asked a question just now by Mr. Frith with regard to Bassadore, which I will answer before entering on the subject of Herat. Bassadore is the name of the station in the Persian Gulf where the ships of our squadron have their several depôts, and where the general naval hospital is also established. It is situated on the island of Kishm, at its north-western point, and is the port at which all the ships usually touch in their passage up and down the Gulf, and where, on the present occasion, the fleet rendezvoused preparatory to the attack on Bushir. This position of

Bassadore was granted to us by the Imam of Muscat, to whom the island of Kishm belongs, at the period of our expedition against the pirates of the Gulf, and it has answered our purpose quite sufficiently up to the present time. It is possible, however, that in the course of the present operations the station may be changed; instead of Bassadore we may perhaps occupy the island of Karak or some other more convenient station. Bassadore is our own soil at present, but it is not a good position for a naval station. There is a great deficiency of water, and the place is too distant from Bushir and Bussora to be of any political weight. If we were able to exchange it for some other place nearer at hand, it would certainly be to our advantage.

With respect to Karak, I do not altogether agree with the observations contained in General Monteith's paper. Although the island is sufficiently supplied with water, and is moreover conveniently placed, it possesses the worst anchorage perhaps throughout the Gulf. If it ever become, indeed, a place of any importance, it will be so, not *in consequence* of its physical character, but rather *in spite* of it. The whole island is a mass of coral rock, and it is only one particular corner of it that is habitable. At this corner the rock is covered with a small patch of soil, which suffices for a scanty cultivation; here is erected the fort, around which are a few gardens, but there is no harbour, nor even a roadstead. Vessels ordinarily anchor out on the southern coast of the island, where they are sheltered from the prevailing north-westers, but immediately the wind shifts and blows from the south-east they are on a lee-shore; so that they generally have to lie with springs on their cables, prepared to slip immediately the wind shifts and run round the point for shelter; they lie again on the northern side of the point until a north-wester comes, then they have to return to the anchorage S. of the island. That is such a disadvantage for merchant vessels, that really I cannot contemplate the possibility of an island so circumstanced ever becoming a great commercial emporium. At present merchant vessels will never anchor off the island, unless compelled to do so; they used merely to pay short visits to the island during our previous occupation, taking up their permanent anchorage in Bushir roads. Owing to this great maritime defect I should be very sorry to see any attempt made to turn Karak into a commercial emporium, like those which previously existed in the Gulf, for I am confident such an attempt would fail. If it had been a place where it was possible to establish an emporium, no doubt it would have been selected for the purpose before this, as its geographical position is excellent. At the same time, as it happens to be in the line between Bushir and the mouth of the Euphrates, it may perhaps be of some use as a telegraphic station, and as such we might retain it, but I cannot see any other use for it.

Other questions have been addressed to me with reference to a subject which is almost too great to enter upon just at the close of the meeting. Still if the meeting be desirous to hear a few words upon the geography of Herat, I shall be quite prepared to offer them. I mentioned before that we have been twitted with ignorance on that subject. It is sufficiently discouraging to geographers, and especially to this Society, which has been established for the promotion of geography, that the great leader of the English press—which may be considered as the exponent of the intelligence of the English nation—should profess an entire ignorance on the subject of Herat, not only ignorance of its geography, but actually of the country to which it belongs. We were told not long ago that its position was not known within a degree of longitude, and that it was a doubtful point in political science whether it belonged to Afghanistan or Persia. Now I hardly think that is a fair statement of the case, and I am glad to see that such ignorance, either real or affected, has not been endorsed, generally, by the public feeling of England. If you cast your eyes on Mr. Walker's map of the N.W. frontiers of India, suspended on the

wall, you will find Herat most accurately, scientifically, and clearly laid down, for the position was determined by Colonel Sanders, of the Bengal Engineers, by chronometer, by observation, and by triangulation, from the Indian base. The question as to whether it belongs to Afghanistan or Persia I will answer in a few words. Persia has belonged to Herat, but Herat has never belonged to Persia, as an integral portion of her territory. After the death of Timour (or Tamerlane), his son, Shah Rokh Mirza, established his capital in Herat, and during his reign the whole kingdom of Persia was thus in dependence on the city. After that time, Herat was generally an independent country. During the time, however, of the Seffevis, for a short period the Persians obtained forcible possession of Herat, as they also did of Bagdad, and so far as a right by conquest is concerned, they have as good a claim to one city as the other. The Seffevis were succeeded by Nadir Shah, who first placed the Dorani tribes in Herat. At his death Ahmed Shah instituted the Afghan monarchy, and from that time to the present Herat has always been an independent Afghan principality, so that the Persians cannot possibly lay any territorial claim to Herat. Having thus cursorily noticed the political character of the country, I will now say a few words with regard to its geography. It is frequently said that all the great lines of route through Asia centre at Herat, and that it derives its importance from this circumstance, but this is not by any means the case. Herat is of importance for the following reasons. Firstly, because it lies upon the high road from Persia to the Indies; there being no other route. Every caravan, indeed, army, or anything else, coming from the west, must necessarily march by Herat to enter Afghanistan. Then, again, the district round Herat is probably the richest in Asia; and there is this further peculiarity, which is a great military advantage, that in the same line there happens to be at a convenient distance another district of almost equal fertility. Herat is the first station, and Nishapore is the second. These two are situated at a convenient distance from each other, and can furnish supplies to an almost unlimited extent. To obtain a just idea of the fertility of the district, we have only to remember that the army of Mahomed Shah in 1838, from fifty to sixty thousand strong, remained in the neighbourhood of Herat for more than ten months, drawing supplies from the villages around without experiencing any scarcity. In that district there are four or five hundred rich villages with abundance of water, and the plain is one continued sheet of cultivation for 50 or 60 miles in extent. Lastly, the city itself is of extraordinary military strength, being surrounded by a great mound of earth, such as we call a "*fausse-braie*," of enormous height (80 or 90 feet high), and at a considerable slope. Upon the slope also is a double line of trenches with traverses to protect them from an enfilade fire. The place is thus quite strong enough to protect itself from any *coup de main* on the part of Oriental assailants; and if improved by a few scientific additions, such as flanking defences, escarpment of the ditch, &c., it would present a sufficiently formidable front even to a European army. In the recent affair, it must be remembered, it was not taken by the Persians, but it capitulated for want of provisions. The siege might have been protracted six months longer, without much risk of danger, if the garrison had been only furnished with supplies. From Herat to Candahar the country is quite open and sufficiently easy; there would indeed, to use a familiar illustration, be no difficulty in driving a four-in-hand the whole way. The mistake that we are in the habit of making in considering Herat, is that we put it in the same category with Cabul; but this is altogether wrong. It is an error that has obtained a general belief without any reason whatever. Herat has, in fact, no connexion with Cabul, either geographically, politically, or physically. The Cabul line to India is no doubt extremely difficult, almost impracticable for armies; whereas the country from Herat to Candahar, below the hills and so on to the plains of Sindh, is perfectly open,

and practicable for troops in every direction. It should be remembered, indeed, that during the whole of the Affghan war we never had a reverse or even a check in Western Affghanistan, with the exception of that single affair of Sir Richard England's at Hykelzye; so that it is hardly fair to place Herat and Candahar in the same category with Cabul. At present the Persians are in occupation of Herat, and we are at war with Persia for the purpose of compelling her to evacuate the city and restore it to the Affghans. It is to be hoped, and I confidently expect, that the war will have that effect. But if it be otherwise, if the Persians do not evacuate Herat, then comes the question, what are we to do? It is very currently believed that the forces sent up the Gulf, are for the purpose of marching on Herat; but that is an absurd idea, that could never have entered into the imagination of any person acquainted with the country. The country between Shiraz and Herat, being for the most part a salt desert, is perfectly impracticable to an army; but I am not prepared to say that, in a geographical, physical, or military point of view, there would be any difficulty in marching a force from our own Indian frontiers to Herat, in order to expel the Persians from the city. I should be sorry to see such a campaign undertaken, because of the expense; but the movement is perfectly practicable, and would almost certainly be successful, if we were content with the one definite object of recapturing Herat. In the former Affghan war, all our disasters arose, it might be remembered, from alterations of the original plan. Having marched through Affghanistan and placed Shah Shuja on the throne, our work was accomplished, and we should have retired, but, instead of returning, we remained in the country, and thus exposed ourselves to disaster. In the same way, if we were now to march upon Herat, and, having expelled the Persians, were to insist on remaining in military occupation of the place, we might be subjected to great difficulties on account of the exceptional position of the country. In England, we are apt to forget that the social condition of Affghanistan, is different from that of any other eastern country. Throughout Candahar and Herat, and partially in Cabul, the lands are in possession of a privileged class, the Dorani aristocracy. These chiefs possess great power, and are, in fact, the lords of the country, holding their vast estates on a sort of feudal tenure, and having the peasantry under them. Now the Doranis would necessarily be put on one side, if we were to assume the government of the country; and foreseeing their fate, they would thus be predisposed to become our enemies. It would be vain indeed to attempt to hold the country, unless the Doranis were removed; and although the Persians might not scruple to undertake such a work of depopulation, the English of course could not accept its responsibility. In the times of Sennacherib and Tiglathpaleser, such things were often done,—whole nations were transported from one country to another, and similar means are still occasionally resorted to in the East, for taming a turbulent population. But the British Government, in the nineteenth century, could not of course be a party to any such proceeding. I repeat, therefore, in conclusion, that if we are content to march on Herat, expel the Persians, and return to India, there is no difficulty or danger in the enterprise; but that, if we attempt to retain a permanent footing in the country, we shall inevitably incur disaster.

The **PRESIDENT**, in conveying the expression of the thanks of the meeting to Sir Henry Rawlinson, regretted that the lateness of the hour alone (it being near eleven o'clock) prevented a more lengthy discussion on the subject then under notice. He saw present several travellers who, from their personal knowledge of the country, could no doubt have afforded them very valuable information. He must, however, adjourn the meeting until the 23rd instant.

Eighth Meeting, Feb. 23, 1857.

SIR RODERICK I. MURCHISON, PRESIDENT, in the Chair.

PRESENTATIONS.—*Walter Bryant; John Gulchrist; and Z. D. Hunt, Esqrs., were officially introduced upon their election.*

ELECTIONS.—*The Hon. A. Kinnaird, M.P.; Capt. W. A. Willis, R.N.; Lieut. J. H. Glover, R.N.; and H. M. Addey; E. Coghlan; D. Stewart Dykes; T. K. Fletcher; S. L. Howard; and J. S. Sherrin, LL.D., Esqrs., were elected Fellows.*

DONATIONS.—The following were among the donations since the former meeting:—The 'Atlas Geografico Estadístico é Historico de la Republica Mexicana,' par Antonio Garcia y Cubas, presented by the author, through General Almonte, the Mexican Minister; the 'Map of Scinde,' in four sheets, by the Quartermaster-General (Bombay) Colonel Neil Campbell, presented by Lieut. Watson; a copy of 'Meteorological Observations made during the progress of the Survey of Ireland,' by order of the Secretary for War, and further contributions from the Ordnance Map Office, consisting of 274 sheets of Yorkshire, on the scale of six inches to a mile; the 6-inch maps of Fife, Kinross-shire, and Linlithgowshire; plans of several towns on the 5-feet scale, extending to 1360 sheets; maps of Aldershot, &c., presented through Colonel James; No. 18 of Dr. Blackie's Imperial Atlas; MS. Maps of 'Bahia de Todos os Santos,' presented by E. Porter, Esq., F.R.G.S., &c.

ANNOUNCEMENTS.—It was announced that a letter had been received from Sir J. C. Melvill, Secretary to the Honourable East India Company, informing the Council that the Society would be furnished with a complete set of the Company's charts, together with nautical directions and other maps and works relating to geography.

EXHIBITIONS.—The PRESIDENT called attention to the bust of Dr. Livingston, by Mr. Miller.

AUDITORS.—Thomas H. Brooking and E. Osborne Smith, Esqrs., on the part of the Council; and H. Raper, R.N., and Francis Le Breton, Esqrs., on the part of the Society, were appointed Auditors.

The papers read were:—

1. The Secretary read extracts from notes on the Expedition up the Nile, communicated to him by M. Le Comte d'Escayrac de Lauture. The naval portion of the expedition under the command

of our countryman, Mr. Twyford, although with great difficulty, had ascended for the first time with steamers the celebrated cataracts of the Nile, and early in January had arrived in the town of New Dongola. The Count, however, had been obliged to suspend operations until the next season.

COLONEL SYKES, V.-P.R.G.S., said he held in his hand a letter from the Comte d'Escayrac de Lauture to the Secretary. In it he complained that the Germans attached to the expedition threw impediments in the way. He also said that the Austrians had a mission at Khartûm, on the White Nile; and when the Pasha sent troops for the safety of the traders up the river, he found that the Austrian missionaries had distributed little Austrian flags, which had produced a great effect in Egypt, as if they were going to act the part of the Spaniards in South America. The Comte adds—"I am very glad that it was an Englishman who achieved this first success in thus ascending the cataracts of the Nile. With respect to Twyford, I have thought it right to increase his salary." Then, he continues, he had no doubt this great enterprise would experience very great obstacles; "but with the two people, the English and French—France bold, and urged on by the love of glory; England patiently indifferent to obstacles, and always looking to the future—there can be no doubt about the ultimate results of the expedition."

The PRESIDENT said that M. d'Escayrac had already distinguished himself by the excursions he had made in Africa. He was a French gentleman who had devoted himself to the cause of geography, and was therefore entitled to the consideration of that Society. He had, at the request of the Pasha, invited gentlemen of different countries to accompany him in this expedition, and it was gratifying to find that with none of his companions had he been more satisfied than with Mr. Twyford, the young English sailor.

2. *Proposed Communication in Asia Minor, between the Lake of Sabanja, the River Sakaria, and the Gulf of Nicomedia.* By General JOCHMUS.

Communicated by Sir RODERICK I. MURCHISON.

HISTORY establishes that in ancient times the utility had been already recognised of a communication between the Black Sea and the Gulf of Nicomedia, by means of canals which should connect, on the one hand, the river Sakaria with the lake of Sabanja, and on the other, this lake with the Gulf of Nicomedia, directly, or by way of the little river Kara-su.

Down to the end of the last century, the question of this system of canalization had been seven times agitated; *first* in the time of the kings of Bithynia; *next* under the Emperor Trajan; *then* under two Byzantine Emperors—Anastasius and Alexis; and again during the reigns of the Sultans Bajazid II., Mohammed IV., and Mustapha III.

In ancient times there were technical objections to the execution of this great enterprise; a magnificent Roman bridge 800 feet in length, however, still exists, which, in the environs of Ada-bazâr,

thrown across one of the natural outlets of the lake Sabanja into the Sakaria, attests the importance which the imperial (Roman) government attached to the means of communication in the rich province of Nicomedia. At a later period, under the Ottoman Emperors, measurements and levels had already made known the facility and the incontestable advantages of the hydraulic works then projected.

The Grand Vizier in the year 909 of the Hegira (A.D. 1503) caused the following facts to be made known.

The distance from the river Sakaria to the lake of Sabanja is 9600 siraas (or 19,200 French feet, or about 3½ miles). The distance from the lake to the Gulf of Nicomedia is 22,000 siraas (or 44,000 French feet, or scarcely 9 miles). The difference of level nowhere interposes a difficulty.

Between the Sakaria and the lake there already exists a natural communication by the little river of Sari-déré; and according to the report of Sinan Pasha, it was intended to form a direct canal there,—or rather merely to deepen the bed of the Sari-déré, and to cut a canal throughout the distance of only 2200 feet. To effect the more important communication, that between the lake and the gulf, Sinan Pasha wished to cut a direct canal between Nicomedia and the lake; but it must be observed that the Roman governor Pliny proposed to the Emperor Trajan, either a direct canal, or one considerably deviating from a direct line, which he projected to communicate with the river at present called the Kara-su.

In the year 1172 of the Hegira (A.D. 1758), the Grand Vizier, Raghîb Pasha, revived the same enterprise, in order to give occupation to the poor of Constantinople, then threatened with famine by the failure of arrivals of corn from the Black Sea; and he gave the direction of the works to an Hungarian, the celebrated General de Tott, who was at that time in the service of the Sublime Porte. The Memoirs of the Baron de Tott* prove that there exists no technical difficulty to oppose the execution of these hydraulic works; but the project was nevertheless abandoned, because, the famine having been stayed, popular commotions at Constantinople were no longer feared. The historiographer, Wassîf Effendi, however, has related that some individuals, interested in hindering the projected canalisation, found means to bribe certain influential public officers, who caused the works to be discontinued, the traces of which are still to be seen.

Raghîb Pasha had it especially in contemplation, to insure for

* See Von Hammer.

the capital, in time of peace, as well as of war, by means of an internal communication, plentiful supplies of corn, provisions, and wood, independently of the customary arrivals from the Black Sea and the Mediterranean.

The idea of connecting the Black Sea and the Gulf of Nicomedia through the lake Sabanja was again taken into consideration during the reign of Sultan Mahmoud, of glorious memory; but it seems that a certain Osman Effendi represented that the establishment of this system of canals might facilitate the entrance of a hostile fleet from the Black Sea into the Sea of Marmora, or even military operations against the capital; and these considerations were amongst the principal causes of the last abandonment of this great and noble enterprise.

The danger is altogether imaginary. The undersigned has travelled through the provinces of Nicæa, Nicomedia, &c., and he is firmly convinced that no hazard to Constantinople can arise from the canalisation in question. It is not intended to establish a water communication for ships of the line and frigates, but rather for coasting vessels and small steamboats; and thus to provide for the capital all the advantages of an extensive internal navigation, and a means for the continual and cheap supply of wheat, barley, straw; wood for fuel, carpentry, and shipbuilding; charcoal, and other articles of daily consumption.

The country around the Lake of Sabanja, and all along the river Sakaria both upwards and downwards, is remarkably rich in timber and vegetation, and is capable of the highest culture. Though even at present in a very satisfactory and prosperous condition, its productive powers are susceptible of very great augmentation. It is superfluous to add, that the city of Nicomedia, and the public establishments already existing or to be founded there, would derive considerable advantages from the canals indicated. It may, besides, be considered certain that the tolls to be paid by vessels, as well as the augmentation of the public revenues, and of the value of the forests and other state property in the province of Nicomedia alone, would pay the most liberal interest for the capital expended on the hydraulic works.

What has been stated as to the advantages offered to Constantinople and the province of Nicomedia, relative to the supply of provisions to the capital by means of an internal communication, will also apply nearly in an equal degree to the country around the Lake of Nicæa. The distance from the Lake of Nicæa to the Gulf of Gemlik is nearly the same as that from Lake Sabanja to the Gulf of Nicomedia, with the difference, however, that there already

exists a natural communication between the waters of the Lake of Nicæa and those of the sea. It would, then, only be necessary to form into a canal this channel, by which water from the lake is discharged into the sea, to secure a way for the water-transport of the products of its shores, scarcely a fourth part of which are cultivated.

On the two great Lakes of Nicæa and Sabanja there does not exist at present a single vessel of transport, whilst there are a hundred and sixty small vessels on the Lake of Apollonia, which carry on a lucrative commerce with Constantinople by way of the river of Muhalitch; although the banks of this lake are not nearly so rich or important as those of the Lake of Nicæa, or especially as those of the Lake of Sabanja.*

Constantinople, 25th May, 1846.

The PRESIDENT said this was one of several communications, most of them of greater length, on the comparative geography and ancient encampments in Greece and Asia Minor, prepared by the General and sent to the Society. These would in time be laid before the Fellows in the publications of the Society.

MR. W. J. HAMILTON, F.R.G.S., said, that although he had not visited the particular district alluded to by General Jochmus, he was acquainted with some of the physical features of the country almost immediately connected with it. As far as he had been able to follow the paper, it appeared, with regard to the canalisation between the lake Sabanja, the river Sakaria, and the Gulf of Nicomedia, that General Jochmus proposed that the lake Sabanja should be the principal source whence the water would be derived for the purpose of canalizing the district and supplying the different sluices. He imagined that the bed of the river Sakaria, flowing as it did between a mountainous region and the Black Sea, must be at a higher level than the lake Sabanja; consequently the water would flow from the river into the lake. He did not mean to say that that would offer any great difficulty. The district was one of the best watered in Asia Minor. The Sakaria rose in the interior, and had a very abundant supply of water; and, therefore, if the river Sakaria was higher than the lake Sabanja, would not offer any material obstacle. But the country between that district, and extending northward to the Black Sea,

* Constantinople, 31st May, 1847.

M. Hommaire de Hell, to whom I communicated this memoir, addressed a note to his Excellency the Grand Vizier, Reshid Pasha. His levels are founded merely on approximative data; and although it might be less expensive to make a railroad between the Lake of Sabanja and Nicomedia, an inspection of the ground between the Lake and the Black Sea, which down to the present time has not been examined by M. de Hell, will probably prove that the establishment, in that part, of a canal would be more practicable and perhaps also less costly. There still remains the consideration of the double or triple embarkation and shifting of goods, necessarily expensive, if a railway were to form a part of the line, and the transport were to be effected partly by the Lake of Sabanja, then by land, and lastly by sea. M. de Hell is in error if he believes himself to be the first person who has taken the elevation of the ground in question, as Von Hammer has indicated the exact levels, twice estimated in 1503, by order of the Turkish government, between the Lake of Sabanja and the Sea of Marmora, as well as between this lake and the Sakaria; but there is a great difference between the results obtained in 1503 and in 1847.

was very mountainous; and the probability was that the river must flow at a considerably higher level than the Sabanja. Between the lake and the Gulf of Nicomedia there was no great difference of level. The country also being a mountainous one was not likely to offer any of those facilities for navigation which it appeared the Turks contemplated at a former period, and which was one of the reasons why they objected to give any sanction to the undertaking. The other lake mentioned by General Jochmus he was not acquainted with. The lake Apollonia certainly had a communication with the Sea of Marmora, but from what he saw in the neighbourhood of the town of Apollonia, he should not have imagined there was anything like the number of vessels mentioned by General Jochmus. It might be so. The country, particularly to the northward, was very fertile; vineyards and silk abound; and the trade with Constantinople was very considerable. There could be no doubt that the opening out of this system of canals between Sabanja and Sakaria would very materially facilitate commercial transactions from the Sea of Marmora to the Black Sea.

3. *On the Geography of the Sea of Azov, the Putrid Sea, and the adjacent Coasts, with Remarks on their Commercial Future.* By Capt. SHERARD OSBORN, R.N., C.B., F.R.G.S. [*Abstract.*]

AMONG the hydrographical features of the Sea of Azov, the author alluded to the configuration of its bottom, which, at the greatest depth, seldom exceeding 40 feet, forms a flat in the centre of the basin, extending about 55 miles east and west, and 35 miles north and south. Between this flat and the coast the bottom slopes for the most part gradually, the inclination being generally one foot in a mile between the depths of 30 and 40 feet, and rather more abruptly in shallower water. The regularity of this slope is, however, occasionally interrupted by banks, adjacent to some of the remarkable sandy spits which characterise the coasts of this sea. The Obitochna Banks, S.E. of the spit bearing that name, are attributed to volcanic action, the effects of which in this sea were distinctly exhibited in the occurrence of a submarine eruption in Temriuk Bay, in 1799, described by Pallas. Volcanic phenomena in various forms also occur on the peninsulas of Kertch and Taman. The only rock known to exist within the whole extent of this sea was discovered near the north coast, eastward of Berdiansk, and has been called after H.M.S. Vesuvius.

The sandy spits are constantly extending, and present a steep face, rising out of deep water, against the current from the east; while towards the west they form shoals which are always increasing. These spits are inhabited by fishermen employed by wealthy companies, and wild fowl abound on them. The constant extension of the spits appears to be accompanied by a general diminution of depth, which is said to have amounted to 6 feet in 127 years. This result is hastened by the discharge of ballast from

trading vessels, which the author observed in the form of knolls, all over the bottom near Taganrog, and in the bights off Berdiansk and Mariopol. These knolls form nuclei for fresh alluvial deposits.

The author also described at some length the winds and currents of this sea. He pointed out the influence of the winds on the depth of the water, which strong breezes had the effect of blowing away on the one side and heaping up on the other. The spits afford a shelter against easterly winds, but there is no protection in any part of the sea against the westerly gales. With reference to the currents, the author differs from M. Taitbout de Marigny, who asserts that there is little current in the Sea of Azov. This is maintained to be an error, and the influence of the winds on the motion of the water is regarded as a sufficient indication of the existence of currents, and various examples were given on this point. The rivers also contribute to produce currents from three quarters, viz. the delta of the Don, the Sivash, and the rivers between Taman and Kamisheva. From the entrance of the Gulf of the Don the current passes in three branches:—1st, along the north coast, as indicated by the direction of the spits, at the rate of a knot or a knot and a half per hour; 2ndly, through the centre of the sea, on a S.S.W. course, with a velocity of about one knot per hour; and 3rdly, in a direction nearly due south to Kamisheva Point, curving round from thence to the Jezezin Bank, where it connects itself with the outflow from the deltas of the Kuban, Protok, Beysough, and runs out through the straits of Yenikali.

The physical features of the Spit of Arabat and of the Sivash or Putrid Sea were described from observations made during the late campaign, and the author also dilated upon various topics relating to the surrounding regions, dwelling considerably upon the importance of the Ciscausian Region, both geographically and commercially, and pointing out that it forms the natural highway to Persia and Northern India from Central Europe. Captain Osborn said that a traveller might yet go from *Vienna to Asterabad, via the Danube, Black Sea, Valley of the Kuban, and Caspian*, in a fortnight.

The PRESIDENT returned thanks to Captain Sherard Osborn for his communication, so remarkable for the variety of subjects touched upon. It embraced, in fact, the history of the southern regions of Russia. But there were some points connected with the Sea of Azov to which he should like to recall attention. For example, the title of the paper was upon the commercial future of the Sea of Azov; but Captain Osborn had not told them how many hundreds of years would elapse before the whole of the Sea of Azov was filled up. He—the President—had been along the northern edge of that sea, and could bear testimony to the fidelity and accuracy which Captain Osborn had displayed in his description as to the great mass of matter brought down the Don, and the way in which it accumulated on one side of the spit and edged round to

the other, and as to the uniform character of these spits, being precipitous on the east side and shelving on the west. He would ask whether, in observing these spits from Berdiansk to Taganrog, Captain Osborn had noticed that they were composed of a solid subsoil of tertiary rocks, which on the east side had been eaten down into precipices by the action of the sea, while on the other it was covered with merely alluvial accumulations? He apprehended that these spits were erosions of ancient tertiary cliffs, with which he was tolerably acquainted himself. Another point, upon which Captain Osborn had remarked, was that there were portions of the sea very saline, and others not so. That phenomenon existed, not only throughout the Sea of Azov, but also in the Caspian, and was due to the presence of subterranean salt-rocks which cropped out here and there in great masses. The Russians could have any amount of rock-salt they pleased. The modern Azov must be far from the ancient town, as in the great siege, ships went up to the walls of the town.

CAPTAIN OSBORN said that the statistics to which he referred affirmed that the sea had diminished six feet in 127 years. If it continued at that rate, it would fill up in 350 years; still he thought the Don and other large rivers which discharge into this sea would always cut a channel for themselves. The Russians asserted that the Caspian had deepened, although there was no outlet out of the Caspian, and two or three large rivers discharged themselves into it on the northern side. Having stated that in 1672 the Russians found six feet of water on the bar of the Volga, and in 1743 twelve feet, he was told that at Asterabad, the Persians could point out villages under water and trees that had been covered, and that where animals could ford at one time, there were now two fathoms of water. It was a question, therefore, whether there might not have been a subsidence in the bed of the Caspian, and whether the Sea of Azov might not be preserved in a similar manner. If the calculations were correct that it would be filled up in 350 years, he thought it must have been filled up along ago. With reference to the spit, it was evident, as Sir Roderick Murchison said, that there had been a rock as a nucleus for the spit to form upon. Beyond these spits again, he found knolls formed by the discharge of ballast from vessels. Around these knolls the mud was deposited rapidly, forming perfectly cone-shaped shoals, and in a short time a series of these soon got connected together. If some means were not taken to put a stop to this system, the sea would in a short time hardly be navigable.

MR. LAURENCE OLIPHANT, F.R.G.S., said, it was five years since he went over these countries, still he could quite corroborate what Captain Osborn said with respect to the current in the Sea of Azov.

The commercial aspect of affairs in that country was very interesting to a stranger. The prohibitive system of Russia had nowhere been more strongly developed than there, and its deleterious influence was clearly perceptible. Kaffa was the natural outlet for the commerce of that country, but the Russian government had forced the commerce to go by way of Taganrog and Kertch. In judging of the period that would elapse before the Sea of Azov filled up, it would be necessary to take into account the conduct of the Russian officials. The Sea of Azov had been in existence 2500 years, to our certain knowledge, and they could hardly calculate that it would fill up in 350 years. But the Russian officials were doing all they could to fill it up. Vessels arriving at Taganrog were strictly forbidden to throw out ballast, but upon payment of a bribe, the Russian officials allowed it to be thrown out. The consequence was, that, as Taganrog prospered, the harbour got filled up, and in time he supposed it would be so prosperous that there would be no harbour at all. The import duties levied by the Russian government were so high that vessels could only go in ballast. With respect to the country of the Don Cossacks, which he had crossed from one end to the other, he could only say that a more dreary, desolate, and detestable country he never travelled over. The Tchernozienne,

or black soil peculiar to the country, might produce fine corn, but it was wonderful how little corn could be seen in crossing the country. He saw plenty of dried-up grass.

The PRESIDENT.—In what season?

MR. OLIPHANT.—In October; but still he did not see evidences of cultivation. The idea which forced itself on the mind, in considering this fertile country teeming with resources, was, not that it was improving rapidly, but that it should have improved more rapidly. The country between the Kuban and the Caucasus was one of the most magnificent in the world. It consisted really of savannahs; the grass in the valleys grew six or eight feet long. The character of the country of the Don Cossacks was quite different; there the steppes were undulating, like a sea in a heavy swell. There was no nation, he believed, that understood less the development of the resources of a fertile region than the Russian. If it had been in the hands of the Americans, the aspect of affairs would have been very different. Were they to possess it for twenty years, the harbours, instead of being choked up, would be used as the natural outlets for the produce of the country, if they were available for the purpose, nor would places be chosen for ports which were the very worst that could be selected. Taganrog, Kertch, Gheisk, ought not to be ports at all. He would explain why Kaffa was the natural outlet of the country. At Taganrog, vessels had to anchor several miles off the coast, and the corn which was brought down the Don, had to be reshipped four times before it was finally deposited in the hold of the vessel, after it had passed through the straits of Kertch. Whereas, if Kaffa was the emporium, lighters could come right down even from Tcherkask without ever taking out their cargo, and the whole commerce of the country would be concentrated there. He believed Kertch was a pet place of Prince Woronzoff, and Taganrog was created by the Emperor Alexander; these places had been selected not because they were the natural outlets for the country, but because certain individuals took a fancy to them.

The PRESIDENT.—It is the fact that the natural filling up of the sea has occasioned them to move ports farther towards the water.

MR. OLIPHANT.—Just so. The anchorage at Taganrog is 20 miles off.

CAPTAIN OSBORN.—There is an anchorage about 6 miles off straight south of Taganrog.

MR. OLIPHANT.—The merchant vessels were at anchor an immense distance off when I was there.

Ninth Meeting, March 9, 1857.

SIR RODERICK I. MURCHISON, PRESIDENT, in the Chair.

PRESENTATIONS.—*Capt. W. A. Willis, R.N.; Lieut. William Chimano, R.N.; Dr. J. S. Sherrin; and D. S. Dykes, T. K. Fletcher, and S. M. Howard, Esqrs., were officially introduced upon their election.*

ELECTIONS.—*Col. P. Anstruther, C.B.; Capt. W. J. Eastwick; the Rev. Dr. Elder; the Right Hon. Lord Falkland; Commander F. K. Hawkins, R.N.; Dr. E. Hamilton, M.D.; Capt. Jenkin Jones; Col. the Hon. W. L. Pakenham; the Lord Bishop of St. David's; Sir Justin Sheil, K.C.B.; the Earl of Shelburne; Sir W. Fenwick Williams of Kars, Bart.; and R. Sinclair Aytoun, E. G. Culling Eardley, Thomas Gillespy, W. B. Green-*

field, G. W. Lennox, W. B. Long, J. C. Marshman, and A. Searcy, Esqrs., were elected Fellows.

DONATIONS.—Among the principal donations received since the last Meeting, were Plans and Sections, published by the War Department; ‘*Percement de l’Isthme de Suez, etc.*,’ by M. F. de Lesseps; and the Journals of the Scientific Bodies of France, Prussia, the United States, and Canada.

EXHIBITIONS.—Lieut. W. Chimmo, R.N., F.R.G.S., exhibited certain relics connected with the search for the North Australian Expedition under Mr. Gregory, found on the coast of the Gulf of Carpentaria and on the banks of the Victoria River, and referred to in his Paper in the ‘*Proceedings.*’

ANNOUNCEMENTS.—1. The President said that a letter had been just received from Captain Richard Burton, announcing his arrival at Zanzibar, on the east coast of Africa, and his intention to proceed, as speedily as possible, for the interior, in search of the Great Lake.

2. The Twenty-sixth Volume of the ‘*Journal,*’ and the Seventh Number of the ‘*Proceedings*’ of the Society, were next announced as having been published that day.

3. It was then announced that a letter had been received from the Earl of Shelburne, enclosing, by direction of the Earl of Clarendon, a copy of a despatch from Her Majesty’s Minister at Lisbon, stating that the Viscount de Sa da Bandeira had, by order of the King of Portugal, transmitted the vote of thanks, passed at the Special Meeting of the Royal Geographical Society on the 15th of December, to the Portuguese Authorities of East and West Africa, for their kind reception of the intrepid Dr. Livingston.

*Address by Sir Roderick Murchison on Opening the Meeting of the
Royal Geographical Society, March 9, 1857.*

GENTLEMEN,—An attachment resulting from and cemented by an intercourse of nearly thirty years’ duration would naturally have led me at our last meeting to express to you my grief upon the occasion of the decease of my valued friend the Earl of Ellesmere; but the grave had not then closed over his remains.

Now, that the sad ceremony has been performed, in the presence of many a true mourner and amid the wail of a devoted tenantry, I cannot allow this the first opportunity presented to me to pass, without giving utterance to the feelings of sincere sorrow which I experience, in common, I am sure, with all members of the Royal Geographical Society, upon the loss of such a man.

Of him, I may well say that his whole career was as honourable to himself as it was useful to his country; for his knowledge of our pursuits was one only of the many accomplishments in science, letters, and arts, which his

bright mind had mastered, whilst his urbanity, benevolence, and kind-heartedness, shone forth in every transaction of his well-spent life.

This is not the time, Gentlemen, for me to dwell longer on the lofty character of our deceased former President; but at the ensuing Anniversary it will be my earnest endeavour to prepare, with what power I possess and all the love I bore him, a brief biographical sketch of one, who, whether we judge him by his private or his public worth, was pronounced by all who knew him to be the perfect type of an English Nobleman.

The papers read were :—

1. *Remarks on the Geography and Hydrography of South-Western Africa.*

By JAMES CAMPBELL, Esq., Surgeon, R.N., F.R.G.S.

H.M.S. 'Plumper,' St. Philip de Benguela,
February 18th, 1856.

THE river Zaire, or Congo, is the largest arterial stream of Western Africa south of the equator, and discharges itself into the ocean in lat. 6° to $6^{\circ} 08'$ S., and long. $12^{\circ} 12'$ E. It was explored for some distance, in 1816, by the expedition under Captain Tuckey, R.N., and is laid down as having an E.N.E. direction up to the termination of his ascent. The object of this voyage appears to have been for the purpose of ascertaining the correctness of the theory promulgated by Park, viz., that this river was identical with the Niger, and constituted its embouchure, which has long ago been negatived by the explorations of the Landers. It was surmised by Captain Tuckey and others, that its source was to the northward of the equator, in a large lake or lakes, probably not far from the southern declivity of the Donga mountains; but the periods during which it undermines its banks, as evidenced by floating islands, increase of current, and height of water at its mouth, point to a different direction.

The wet season in the Bight of Biafra extends from May to October, and the quantity of rain that falls is enormously great; but even in the dry season, which comprises the remaining months, there are sudden though temporary deluges. On the sea-board of the Congo country—and we may assume its interior to be similarly season-governed—there are two showery seasons: one from October to December, and a second from March to May. These, as compared with the rains of the windward and leeward coasts north of the equator, do not deserve the appellation of "wet season," for the showers are of no duration or intensity. In the interior, however, the fall must be considerable, and, indeed, at a distance of thirty miles from the entrance of the river a marked increase of rain is experienced. As it is during those so-called "wet months" that the Congo is at its highest level—December in particular—we may

justly conclude that its source, or at least the parent stream—should a confluent really exist to the north—is within a few degrees south of the latitude of its mouth, but at a great distance inland. This hypothesis is strengthened by the recent exploration and traverse of Southern Africa by Dr. Livingston, who saw a large river in lat. $11^{\circ} 17' S.$, and between the 22° and $23^{\circ} E.$ long. He has mapped it under the names Casai, or Loke, and describes it as about 120 yards broad at the above position. The stream was forded at the same place, and was described by intelligent natives to form the Zaire or Congo river. It was flowing to the N.E. He also forded another large stream called the Coango or Quango, “the Tortuous,” in the valley of Cassangé, the width of which was about 150 yards, and flows nearly north. This river was forded in $9^{\circ} 51' 28'' S.$ lat., and about the 19° of $E.$ long. The inhabitants and Portuguese traders described it as flowing into the Congo.

I apprehend this traveller's data will decide the geographical position of the source of the River Congo.

The hydrographical features of this river have been displayed by Captains Owen and Vidal in their survey of its entrance; but they and others appear to have omitted two peculiarities connected with its seaboard and bed:—

First.—That the crescentic portion of land extending from a little to the southward of Point Padron to Shark Point, is evidently due to the reproductive effects of marine and fluvial action. On the river-side, the large Bay of Diegos skirts the annexed land, and in some places dips into it in the form of creeks. This portion is densely covered with the trees and bushes usually seen at the entrance of tropical tidal rivers, and has a black loam with fine sand for a soil. It is very little elevated above the sea, and is flat. This bay is of little depth, has a muddy bottom, and I believe will, at no distant era, be reclaimed from the river by the silting up of this part of its bed. The sea-bordering portion, on the contrary, is more sparingly covered with vegetation; there are none of the giant mangroves to be seen, and its trees are of much less altitude. The soil is composed of attrited shell, mixed with sand, and is considerably elevated—about 15 feet—above the sea; so that in crossing the narrow belt from seaward it forms a miniature hill before reaching the alluvial detritus on the river-bank. Having had my attention called, whilst serving on the Newfoundland coast, to the action of the sea in raising a sandy spit between and joining the French island Miquelon, I feel confident that the ridge or ridges—for a succession of them can be detected—have been thrown up by the heavy surf, which occasionally sets heavily on shore. The

extremity of Shark Point and its projecting shoal have evidently extended since I saw them in 1845. It is, moreover, an universal rule on the south coast of Africa for headlands or rivers to have a spit or reef off their southern or left bank; but the majority, no doubt, owe the sandbank to the continual action of the South African current.

Second.—That on the right bank, or rather off Red Point, there are a number of holes in the sea-bottom, which, I imagine, are produced from the tearing away of the soil by the violence of the current, as it is there it flows with greatest force and frequency.

2. *On the Quilimane and Zambesi Rivers.* From the Journal of the late Capt. HYDE PARKER, R.N., H. M. Brig 'Pantaloön.'

Communicated by Captain J. WASHINGTON, R.N., F.R.G.S.

THE Luabo is the main outlet of the Great Zambesi. In the rainy season—January and February principally—the whole country is overflowed, and the water escapes by the different rivers as far up as Quilimane; but in the dry season neither Quilimane nor Olinda communicates with it. The position of the river is rather incorrect in the Admiralty chart, being 6 miles too much to the southward and also considerably to the westward. Indeed, the coast from here up to Tongamiara seems too far to the westward. The entrance to the Luabo River is about 2 miles broad, and is easily distinguishable, when abreast of it, by a bluff (if I may so term it) of high straight trees, very close together, on the western side of the entrance. The bar may be said to be formed by two series of sandbanks,—that running from the eastern point runs diagonally across the entrance and nearly across it. Its western extremity is about 2 miles outside the west point.

The bank running out from the west point projects to the southward $3\frac{1}{2}$ miles, passing not one quarter of a mile from the eastern or cross bank. This narrow passage is the *bar passage*. It breaks completely across at low water, except under very extraordinary circumstances. At this time—low-water—a great portion of the banks are uncovered; in some places they are 7 or 8 feet above water.

On these banks there is a break at all times, but in fine weather, at high water, a boat may cross near the east point. There is very little water, and, in places, a nasty race and bubble, so that caution is requisite. The best directions for going in over the regular bar-passage, according to my experience, are as follows: Steer down

well to the eastward of the bar-passage, so as to avoid the outer part of the western shoals, on which there is usually a bad sea. When you get near the *cross-bar*, keep along it till the bluff of trees on the west side of the entrance bears N.E.; you may then steer straight for it. This will clear the end of the *cross-bar*, and, directly you are within that, the water is smooth. The worst sea is generally just without the bar-passage.

Within the points the river widens at first and then contracts again. About 3 miles from the Tree Bluff is an island; the passage up the river is the right hand side of it, and deep. The plan will best explain it. The rise and fall of the tide at the entrance of the river being at springs 20 feet, any vessel can get in at that time, but, with all these conveniences for traffic, there is none here at present. The water in the river is fresh down to the bar with the ebb-tide, and in the rainy season it is fresh at the surface quite outside. In the rainy season, at the full and change of the moon, the Zambesi frequently overflows its banks, making the country for an immense distance one great lake, with only a few small eminences above the water. On the banks of the river the huts are built on piles, and at these times the communication is only in canoes; but the waters do not remain up more than three or four days at a time. The first village is about 8 miles up the river, on the western bank, and is opposite to another branch of the river called "*Muselo*," which discharges itself into the sea about 5 miles to the eastward.

This village is very extensive, and about it there is a very large quantity of land in cultivation; calavances, or beans, of different sorts, rice, and pumpkins, are the principal things. I saw also about here some wild cotton, apparently of very good quality, but none is cultivated. The land is so fertile as to produce almost any without much trouble.

At this village is a very large house, mud-built, with a courtyard. I believe it to have been used as a barracoon for slaves, several large cargoes having been exported from this river. I proceeded up the river as far as its junction with the Quilimane river, called "*Boca do Rio*," by my computation between 70 and 80 miles from the entrance. The influence of the tides is felt about 25 or 30 miles up the river. Above that the stream, in the dry season, runs from $1\frac{1}{2}$ to $2\frac{1}{2}$ miles an hour, but in the rains much stronger. The banks of the river, for the first 30 miles, are generally thickly clothed with trees, with occasional open glades. There are many huts and villages on both sides, and a great deal of cultivation. At one village, about 17 miles up on the eastern bank, and distinguished by being surrounded by an immense number of bananas

and plantain trees, a great quantity of excellent peas are cultivated, also cabbages, tomatos, onions, &c. Above this there are not many inhabitants on the left or west bank, although it is much the finest country, being higher and abounding in cocoa-nut palms; the eastern bank being sandy and barren. The reason is, that some years back the Lanelines, or Caffres, ravaged all this country, killing the men and taking the women as slaves, but they have never crossed the river; hence the natives are afraid to settle on the west bank, and the Portuguese owners of the different "prazos" have virtually lost them. The banks of the river continue mostly sandy, with few trees, except some cocoa-nut palms, until the southern end of the large P. of Nyangué, formed by the river about 20 miles from Maruru. Here the country is more populous and better cultivated, the natives a finer race, and the huts larger and better constructed. Maruru belongs to Señor Aseredo, of Quilimane, well known to all English officers on the east coast for his hospitality.

The climate here is much cooler than nearer the sea, and Aseredo has successfully cultivated most European as well as tropical vegetables. The sugar-cane thrives, as also coffee and cotton, and indigo also is a weed. Cattle here are beautiful, and some of them might show with credit in England. The natives are intelligent, and under a good government this fine country might become very valuable. Three miles from Maruru is Mesan, a very pretty village among palm and mango trees. There is here a good house belonging to a Señor Ferrão; close by is the canal of communication between the Quilimane and Zambesi rivers, which in the rainy season is navigable. I visited it in the month of October, which is about the driest time of the year; it was then a dry canal, about 30 or 40 yards wide, overgrown with trees and grass, and, at the bottom, at least 16 or 17 feet above the level of the Zambesi, which was running beneath. In the rains, by the marks I saw, the entrance rise of the river must be very nearly 30 feet, and the volume of water discharged by it enormous.

Above Maruru the country begins to become more hilly, and the high mountains of Boruru are in sight; the first view of these is obtained below Nyangué, and they must be of considerable height, as from them they are distant above 40 miles. They are reported to contain great mineral wealth; gold and copper being found in the range, as also *coal*. The natives are a bold, independent race, who do not acknowledge the Portuguese authority, and even make them pay for leave to pass unmolested. Throughout the whole course of the river, hippopotami were very abundant, and at one village, a chase by the natives was witnessed. They harpoon the

animal with a barbed lance, to which is attached, by a cord 3 or 4 fathoms long, an inflated bladder. The natives follow in their canoes, and look out to fix more harpoons as the animal rises to blow, and, when exhausted, despatch him with their lances. It is, in fact, nearly similar to a whale-hunt. Elephants and lions are also abundant on the western side; the latter destroy many of the blacks annually, and are much feared by them. Alligators are said to be numerous, but I did not see any.

The voyage up to Maruru occupied seven days, as I did not work the men at the oar, but it might be done in four; we returned to the bar in two and a half days.

There is another mouth of the Zambesi, 7 miles to the westward of Luabo, which was visited by the 'Castor's' pinnacle; and I was assured by Lieut. Hoskins that the bar was better than the one I visited.

The PRESIDENT, in inviting discussion on the subject of these papers, referred especially to Dr. Campbell's communication, which, he said, was replete with interest in geological and geographical points of view.

DR. LIVINGSTON pointed out on the chart various rivers that he crossed in the district of the Congo, which, he said, flowed generally towards the centre of the country, and then turned away to the north. When he came to the Quango, he found it running due north, and the Portuguese whom he met, who had been making inquiries amongst the natives, told him that they believed it to form with the Kasai, the Congo or Zaire. He understood from some officers he met at Loando, that there was an immense body of water, discharging itself into the sea; he thought it might be possible to navigate the Kasai or Loke down to the sea, and on his return he had intended to go some distance down the river, to ascertain that point. When he came to Cabango, he met some people who came from a town under a chief called Mai, and they informed him that at that town there was a large waterfall on the river, and that after it passed the waterfall, the river joined the Quango. The Kasai was much the largest river, and when it joined the Quango it became the Zaire. He asked one of the men to imagine himself standing in the town of Mai, and to point out the confluence of the Kasai and the Quango. The man pointed west, and said, "Five days in that direction, the Quango and Kasai join together and form the Zaire." He also said he believed there was another branch coming from the north. If persons did not believe the accounts of these natives, it would be well if they would go and examine for themselves. With regard to the Zambesi, he came down that river at a different time of the year from that at which Captain Parker went up to the beginning of the delta—the point at which he, Dr. Livingston, left it, being severely attacked by fever. Having traced on the chart the course of the Zambesi and the Quilimane river and their slight connection with each other, Dr. Livingston said, he was informed by the Portuguese, that Captain Parker had come to the end of the delta, and was delighted with the appearance of the river up to that point. The mountains mentioned by Captain Parker were those opposite Sena. They formed a very high range, about 8 or 10 miles long, and at the top was a hot, sulphureous fountain. The people who lived on the mountain had been fighting with the Portuguese; hence the latter declined to accompany him there. On the opposite side there was a very high mountain to be seen in the distance, called the Gorongozo, with certain in-

scriptions on its top. It was famed for its salubrity and the purity of its waters, and the Jesuits, accordingly, had a settlement there. Below that point the river was capable of bearing a very large vessel, but as he had only seen it at its height, he could not be supposed to know its capabilities at any other time of the year. He had lately received a note from Lieutenant Hoskins, who served under Captain Parker, and this gentleman stated that he perfectly agreed with what he, Dr. Livingston, said in reference to the Quilimane river not being the Zambesi at all :—

“The Zambesi appears to have five principal mouths, of which the Luabo is the most southern and most navigable; Cumana, and two whose names I do not know, not having myself visited it, lying between it and the Quilimane, and the rise and fall at spring-tides on the bar of the Luabo is 22 feet; and, as in the passage, there is NEVER less than 4 feet (I having crossed it at dead low-water—springs), this would give an average depth sufficient for any commercial purposes. The rise and fall is 6 feet greater, the passages narrower and more defined, consequently deeper and more easily found than that of the Quilimane river. The river above the bar is very tortuous, but deep; and it is observable that the influence of the tide is felt much higher in this branch than in the others; for whereas in the Catinna and Cumana I have obtained drinkable water a very short distance from the mouth, in the Luabo I have ascended 70 miles without finding the saltness perceptibly diminished. This would facilitate navigation, and I have no hesitation in saying that little difficulty would be experienced in conveying a steam-vessel of the size and capabilities of the gunboat I lately commanded as high as the branching off of the Quilimane river, which, in the dry season, is observed many yards above the Luabo; though I have been told by the Portuguese that the freshes which come down in December and March fill it temporarily. These freshes deepen the river considerably at that time of the year, and freshen the water many miles from the coast. The population of the delta, except in the immediate neighbourhood of the Portuguese, appeared to be very sparse. Antelope and hippopotami, the former tame and easily shot. I inquired frequently of both natives and Portuguese if slavers were in the habit of watering there to ship their cargoes, but could not ascertain that they have ever done so in any except the Quilimane. With common precaution the rivers are not unhealthy; for, during the whole time I was employed in them (off and on during eighteen months), in open boats and at all times of the year, frequently absent from the ship for a month or six weeks at a time, I had not, in my boat's crew of 14 men, more than two, and those mild, cases of fever. Too much importance cannot be ascribed to the use of quinine, to which I attribute our comparative immunity, and with which our judicious commander, Commodore Wyvill, kept us amply supplied. I hope these few remarks may be of some little use in confirming your views of the utility of that magnificent river.

“A. H. H. HOSKINS.”

It appeared to him, Dr. Livingston, from all the information he could obtain, that this branch of the Zambesi was navigable for ships of some burden, provided they entered at spring tides, but he should not recommend a gunboat to be sent up the river. Although a large vessel might go up without any difficulty, as far as Tete, for some months when the river was full, it would be advisable, in any attempt to ascertain its navigability, to send a vessel of the very lightest draught, otherwise it might get stuck on some bank in a very unhealthy part of the river, and the whole attempt might be frustrated by disease.

In answer to an inquiry from Mr. Galton, Dr. Livingston stated that there were no obstructions in the river lower down than 20 miles above

Tete. There are many reedy islands, but open spaces between them, in which the deep channel is always found. At a range of mountains called Lopata, the river was narrowed, but very deep, and it was at least 300 yards broad at the narrowest part. Twenty miles above Tete, there was a rapid, which he, unfortunately, did not see, as he was obliged to leave the course of the river at that part, in consequence of numerous rivulets which, filling with the rising river, interfered with his progress. The rapids consisted of a number of rocks, jutting out of the stream, which were very dangerous when the water was low. Higher up, was a crack or fissure made through a high ridge of land for about 30 miles, through which the river ran, forming the most wonderful sight he had ever seen. He thought the fissure must have prevented the Portuguese of old from going up by way of the river, and he believed they never went into the valley in that neighbourhood, which should be regarded as an English discovery. On an island there, called Kalai, he saw the grave of a chief with 70 elephants' tusks planted round it, rotting in the sun and rain, and 30 tusks on the graves of his relatives; and all through the country elephants' tusks were similarly used as gravestones—a use to which he believed they would not have been applied, even in the case of the chief, if they could have found a market for them. It was the same as at Lake Ngami, where the tusks were allowed to rot for want of a market. A trader who accompanied him on the occasion of the discovery of the lake, purchased 10 tusks for a musket worth 15s. A market having been established, the tusks would no longer be allowed to rot; in fact, so fond were these people of traffic, that he believed they would rob their fathers' graves, if they could get a penny by it. Wax, also, was often thrown away, because no market was found for it. As soon as the opportunity of selling it presented itself, there could be no doubt that the natives would collect and dispose of it as they did in the west. One great object which he proposed to himself in going back, was to endeavour to make the Zambesi a permanent path for commerce. He had no doubt that if the people on both sides found there was a certainty of getting their goods purchased, they would cultivate and collect the produce of the country most willingly, for one remarkable feature in African tribes was their great desire for barter. He often found great difficulty in passing through some of their villages, the natives trying to stop him and his party, so that they might remain long enough to be compelled to buy their supper. If they only remained to supper, they could get off pleasantly enough the next morning. Several Englishmen and Frenchmen had formerly asked for liberty to go up the Zambesi, but they had been always refused permission to ascend. We had been guilty of that sort of dog in the manger policy ourselves, and were not therefore in a position to look down upon the Portuguese for acting in the same manner. He had been told, however, that they had lately made all the ports on the east coast of Africa perfectly free to commerce.

MR. J. CRAWFORD, F.R.G.S., asked the distance from the mouth of the Luabo to the fissure described by Dr. Livingston?

DR. LIVINGSTON replied that the distance was between four and five hundred miles by way of the river.

MR. CRAWFORD.—And do you consider the river navigable for four or five hundred miles?

DR. LIVINGSTON.—With the exception of those first rapids. It is nearly 300 miles up to the first rapid, and the fissure is 150 miles past that.

MR. CRAWFORD said if the river was navigable, he could not understand how the Portuguese, who were so close to it, should have always preferred the Quilimane. They had been in the neighbourhood almost from the time of Vasco de Gama, and he could not conceive how they could have been so absolutely stupid as not to have discovered that there was a superior branch of the river close to them. But if the river really was navigable to the extent

of 300 miles, what advantage would a vessel get by going there? None, so far as he could see. Was there any shelter or harbour for its protection? The district was within the sphere of the monsoons, and there must be occasional typhoons or hurricanes; evidently no trading could be carried on. He never knew people so stupid and backward as not to know what to make of their wax and honey. The Portuguese, being close at hand, ought to have a market for their ivory and beeswax. It was mentioned in Captain Parker's paper, that cocoanuts abounded at the junction of the two rivers: that, however, was by no means a proof of fertility, but the reverse; it was an evidence

- that the spot was near the sea, and the coconut thrived generally in a very poor soil, in mere sand. Captain Parker stated also that there was wild indigo; but he should like to know of what kind. There was wild indigo in almost every tropical country in abundance, but the great thing was to cultivate it and manufacture it skilfully. It was a long time before the Hindoos, who had manufactured indigo for two or three thousand years, could compete with the article brought from South America. That did not happen until the process introduced from the West Indies was superintended by Europeans. It would require land of the greatest fertility, and a peaceable and well-established government, capital, and European skill, to enable the Africans to grow a pound of good indigo.

CAPTAIN NOLLOTH, R.N., in reply to Mr. Crawford, said there was no shelter or harbour at the entrance of the river; but that was no reason why ships might not visit it, if the river was navigable. It was not safe, however, for a large vessel to anchor within seven or eight miles from the mouth of the river, on account of the heaps of sand.

The PRESIDENT.—Do you suppose that if smaller vessels were employed to go up the river, larger vessels could anchor in the neighbourhood with safety?

CAPTAIN NOLLOTH.—I have anchored there with safety.

The PRESIDENT.—And there was no dangerous wind blowing on shore?

CAPTAIN NOLLOTH.—None.

DR. LIVINGSTON said 'The Grecian' had visited the Luabo in 1853, and the master thought that a vessel of considerable size could easily go in there, and be completely land-locked and out of observation. He said also that a short time before, he believed a brig under American colours came in and shipped slaves at that port. He (Dr. Livingston) had a drawing from a Portuguese pilot, who told him that there was a good harbour. It was certain that there was an immense body of water flowing into the sea, and naval officers who had gone there declared that it was fit for commercial purposes. Mr. Crawford had asked what a ship could get by going up the river. The same question might have been put in 1849 to Mr. Oswell and himself, when they went to Ngami. Neither Mr. Oswell nor himself picked up a single tusk of ivory, there being fortunately a difference of tastes in the world; but a trader who went with them, filled his waggon with ivory, and made a good thing of it. He asked some Portuguese at Quilimane, how it was they were so stupid as to build the capital of Sena at a place which had no connection with the river of Sena, the Zambesi; and they stated that when Quilimane was founded, the river flowed that way, but that it was now filled up. Quilimane was not a place that any man in his senses would ever think of settling at, except for the advantages of trade. It was built on a great mudbank, with mangrove bushes on both sides of the river, and if you dug down two feet you came to water. The walls, which were made of brick, often sank in, so that the bottoms of the doors had to be cut off, the floors not sinking to the same extent.

The indigo exported from the district in question was said to be very good, and also from Natal, pieces of the same plant had been shown in this country,

having the peculiar copper mark, which the best indigo was said to possess. Whatever its character however might be, it certainly dyed blue, and some of the natives called it the "changer." He did not hold out any great expectations of much gain to be realised immediately. He did not suppose that a great trade would spring up at once, but he had such confidence in the resources of the country, that he intended to devote a portion of his life to their development. If legitimate commerce could be established in that large tract of country, it would be the best means of putting a stop to the slave-trade.

MAJOR VARDON, F.R.G.S., said it would appear from statements that had been made, that the hippopotamus was very easily speared; but he had always been under the contrary impression.

CAPTAIN NOLLOTH explained that where vessels had got over the bar, to which allusion had been made, they could ride in perfect safety inside.

Tenth Meeting, March 23, 1857.

SIR RODERICK I. MURCHISON, PRESIDENT, in the Chair.

PRESENTATIONS.—*Capt. W. J. Eastwick, of the Bombay Army; Lieut. J. H. Glover, R.N.; and W. B. Greenfield, Esq., were officially introduced upon their election.*

ELECTIONS.—*T. W. Bramston, Esq., M.P.; Dr. James Campbell, R.N.; Major-General W. G. Moore; the Earl of Munster; Captain Laurence Trent Cave; and William Reed; George R. Smith; Robert Sweeting; and John Vincent, Esqrs., were elected Fellows.*

DONATIONS.—Among the donations since the former Meeting, were—Map of the country of Cape May, State of New Jersey, U.S., presented by E. L. Viele, Esq.; Geometrical Projection of two-thirds of a Sphere, by Colonel James, R.E.; Transactions of the Madras Literary Society; the Bengal Asiatic Society; the Franklin Institute of Pennsylvania, etc.

ANNOUNCEMENTS.—In opening the business of the Meeting, the President announced the receipt of a letter from the eminent Prussian geographer, Carl Ritter, in answer to an anxious inquiry of his own respecting the health of his illustrious friend, Baron Humboldt; and he was truly happy to state that that great man had completely recovered from a momentary attack which had not in the slightest degree impaired his brilliant mind, the continued application of which was of such vast importance to the progress of science. He was happy to see how truly the merits of Dr. Livingston were appreciated by so competent a judge as M. Ritter, who speaks of our countryman as one of the noblest and greatest characters the black race has ever seen.

The PRESIDENT next stated that the Astronomical Observations by

Dr. Vogel and Corporal Maguire, in Central Africa, had been received from the Foreign Office, through the kindness of the Earl of Clarendon; also a copy of a Despatch from Her Majesty's Consul at Tripoli, enclosing a copy of a letter from Corporal Maguire, dated Kuka, November, 1856, announcing the reported assassination of Dr. Vogel at Wadai. Sir Roderick remarked that this was a mere report, and cautioned the members against placing much faith in it, reminding them that similar statements had gained circulation of the death of several other African travellers, who had afterwards, and as he hoped would be the case with Dr. Vogel, returned to this country alive and well.

In quitting the subject of Africa, he had farther to announce that the renewed maritime expedition to the Niger, as advocated by the Society, would soon quit our shores, commanded by the same competent observer and naturalist, Dr. Baikie, F.R.G.S., who had formerly succeeded so well; and he had great pleasure in recording the praiseworthy and efficient manner in which the Earl of Clarendon had again countenanced this important national enterprise.

Sir Roderick then stated that he had received a communication from Sir J. Herschel, enclosing a portion of a letter from Mr. Maclear, Her Majesty's Astronomer at the Cape, in which he remarks that "Dr. Livingston's observations had been reduced and sent to England. The exploit of crossing the African continent from west to east, and of perseveringly fixing, by astronomical observations, the interesting features of the path, combined in placing the poor missionary pre-eminently in the front rank of the most celebrated explorers."

In connection with this subject, the Chairman informed the Meeting that the Government of Portugal had sent out orders to Mozambique to support Dr. Livingston's late companions at the public expense of that province, until his return to claim them.

The Chairman next alluded to the energy displayed by Mr. H. Babbage, at the imminent risk of his life, in overcoming great difficulties when deserted and alone, and to the talent with which he had endeavoured to detect gold-bearing rocks in the vicinity of Lake Torrens, in Australia, and in tracts unknown to Europeans.*

Lastly, he had the satisfaction to state that the expedition under Mr. Palliser would proceed in a fortnight to its starting point on Lake Superior, with the view of surveying vast tracts of British North America, as yet most imperfectly known, particularly the country watered by the affluents of the Saskatchewan, and with the

* See 'Adelaide Observer,' Nov. 22, 1856.

ulterior view of examining the southern portion of the Rocky Mountains in our territories, and possibly of discovering a new practicable passage through them, to Vancouver Island.

He farther stated that Dr. Hector had, on his recommendation, been appointed the geologist, naturalist, and medical man to the expedition, whilst Lieut. Blakiston, R.A., F.R.G.S., was to make magnetical observations, as instructed by General Sabine, and the botanical collection as recommended by Sir W. Hooker and Dr. Hooker.

Under these circumstances, the President hoped that an expedition which had originated in the recommendation of the Council of the Royal Geographical Society to Her Majesty's Government, would be very efficiently and successfully completed under the direction of the Colonial Office, and especially of Mr. John Ball, the Under-Secretary, who had undertaken the task with such zeal and knowledge of the subject.

The Rev. C. G. NICOLAY, F.R.G.S., understood that one summer was to be spent in examining the district between Lake Superior and Lake Winnipeg. With due deference to those who had made this alteration in the original plan of the expedition, he thought this would be a mere waste of time. Amid such a network of waters as lay between these two lakes, nothing definite could be done in one summer, and the route itself was already sufficiently well known through the officers of the Hudson's Bay Company and others. He also understood that the first winter was to be spent at Fort Charlton, which was several hundred miles out of the line originally recommended by the Society to be explored. Before the expedition started, he really hoped the instructions would be reconsidered. The great object should be to press across the plains to the south of the Saskatchewan, and get to the Rocky Mountains as soon as possible.

The PRESIDENT said Mr. Nicolay had really expressed his own opinions and the opinions of the Council of the Society. The Government, however, appeared to have other objects in view besides mere geographical discovery; he hoped, therefore, that Mr. Nicolay would not press the subject farther at present.

The papers read were :—

1. *Notes of a Journey eastwards from Shiraz to Fessa and Darab, and thence westwards by Jehrüm to Kazeran in 1850.* By MR. CONSUL KEITH E. ABBOTT.

Communicated by the Earl of CLARENDON.

[This paper will be printed in full in the Journal.]

GENERAL MONTEITH, F.R.G.S., said it was a considerable number of years since he visited this country. He was directed to survey the Passes from Bushir to Shiraz and the plain of Kazeran; and the route was so minutely surveyed that he thought there was no geographical feature that remained to be ascertained. Kazeran he considered a great military point, as it commanded the entrances of the valleys. It was a beautiful region, well watered, and, if cultivated, would be highly productive. He saw there the largest orange-tree he had ever met with, it being 40 feet in height. From Kazeran commenced the most difficult

passes. About nine miles from Shiraz was the pass called the Virgin's Pass, which was, in fact, a flight of steps, protected by a very low parapet wall, yet exceedingly dangerous to pass. It was constructed at the private expense of a merchant, who said he had lost more of his mules in one year than the road cost. To the right of it a good road, however, might be made, without great difficulty, as it was but two miles over, altogether. From this point the route descended into a fine wooded valley, and proceeded along till it reached the Old Woman's Pass, which was about four miles in length. This pass was neither so steep nor so rocky as the other. Beyond this came a succession of well-watered and well-cultivated valleys. The cultivation of the plain of Shiraz itself was limited, owing to the want of water, as the small stream which passed the town was used to water the gardens and fields in the vicinity. Sculptured rocks of the kind alluded to by Mr. Abbott, were to be found in every part of the province. At Kazeran there is a stalactite cave, 100 feet deep, and at the bottom there was a statue which had been thrown down, and the water which formed the stalactite had attached it to the bottom of the cave.

2. *Proposed Search for Dr. Leichhardt's Missing Party.* By SAMUEL SIDNEY, Esq.—(Author of 'The Three Colonies of Australia').

MR. SIDNEY said the paper had been transmitted to him from Australia, by one of the squatters in the most northern district of the province of New South Wales, who had resided fourteen years in the wildest part of the colony, who had himself conducted exploring expeditions in search of "Runs," into districts never before trodden by white men, and who therefore was entitled to speak with all the authority of experience on the subject of the evening—the probable fate of Dr. Leichhardt. The last intelligence received of Leichhardt was contained in a letter dated Cogoon, April, 1848. At that time he expected to reach Swan River, in about three years. The great length of time which had elapsed since Leichhardt's departure, was no proof of his death, because if supported by hunting, which he must be, he could only proceed at the rate of three or four miles a day, and would not leave any place where game was plentiful, as there are many in the oases of the interior. Dr. Leichhardt had, on former occasions, lived on friendly terms with the aborigines and been fed by them, when they were at the same time at war with neighbouring stockowners. The northern Bushmen do not believe the story brought by Mr. Hovenden Hely, that Leichhardt was murdered on a creek 150 miles from Wandaigumbal, on the Condamine. They say that the remains of pack saddles, found by Mr. Hely, were not those of Leichhardt's party, but of two squatters, who were lost in the Bush. They observe that although it is well known that cattle will return 600 miles to their homes, especially if attacked and dispersed by blacks, not one of Leichhardt's large lot has ever been seen—a positive proof that he had penetrated too far for them to return.

They maintain that the route which Leichhardt took on his last expedition, was in all probability on Sir Thomas Mitchell's track, as far as that officer reached to the North. From thence, in his attempt to proceed westward, he was too practical a Bushman to attempt a desert so fearfully illustrated by Sturt; that he would be sure to follow on one side of the coast range or backbone of the colony, to make sure of water and the greatest probability of food;—that he probably reached the longitude of Port Essington, and in endeavouring to push on south-west from thence, has got into some difficulty—perhaps depending on some friendly tribe for food. The south-west being in all probability badly watered, no prudent man would attempt to cross it, except in a wet season, and therefore Leichhardt might be stuck fast with a desert between him and water, waiting for a wet season to travel. That the wild blacks, less ferocious than those on the borders of the pastoral districts, would be likely to retain him among them as a curiosity or deity;—or that he may be gradually winding his way back, hunting for food, at the rate of three or four miles a day;—that therefore if it took him three years to reach the spot where he had to turn back, it would take double that period to return to the point of his departure.

Mr. Sidney's correspondent concludes by suggesting an Expedition in search of Leichhardt, which has been planned by practical northern Bushmen. It should consist of fifteen disciplined aboriginal troopers of the native police force, under the command of Frederick Walker, the late Commandant of that force, who had volunteered to serve without pay or remuneration of any kind, with 60 horses, 45 of which to be laden with supplies—meat rations to be obtained by the hunting blacks. The expedition should start from the farthest station in the Port Curtis district, and get upon Leichhardt's tracks, which would be plain for twelve or fourteen years in a country unoccupied by cattle. As Leichhardt always marked trees at his camp, and his cattle would travel in single file and denote his route, the black troopers would follow these like blood-hounds, and infallibly find Leichhardt's party or bring back his papers, the brands of his cattle, or other complete solution of the mystery, that now hung over his fate.

The expedition should be met by a coasting vessel at some convenient point, and provided with supplies for a second year.

Mr. Sidney concluded by observing that nothing was to be expected from the Home Government; or from the New South Wales or Sydney citizens, with whom explorers and exploring expeditions were alike unpopular. It rested with men of science and wealth to subscribe the three or four thousand pounds needful for ascertaining

the fate of, and perhaps rescuing, the man who had sacrificed everything to the cause of geographical science.

3. *Return of the North Australian Expedition*, under Mr. A. C. GREGORY.

Communicated by G. F. LESLIE, Esq., F.R.G.S.

Burnett District, 2nd December, 1856.

SIR,—I have the honour to inform you of the arrival of the North Australian Expedition within the limits of the settled parts of New South Wales, and transmit for the information of his Excellency the Governor-General a brief outline of the proceedings of the expedition.

From the time of landing the horses at Point Pearce in September, 1855, to the 9th May, 1856, the party was employed in preliminary details, and the exploration of the country to the south of the Victoria River, having penetrated the interior deserts to latitude $18^{\circ} 20'$ south, and longitude $127^{\circ} 30'$ east; a detail of which I forwarded by the 'Tom Tough' schooner, via Copang, and which doubtless has already come to hand.

The schooner 'Tom Tough' having been seriously damaged in ascending the Victoria River, and a quantity of stores and provisions thereby destroyed, I instructed Mr. Baines to embark that portion of the expedition which was not required to form the land party, and to proceed to Copang for supplies, and thence to the Albert River in the Gulf of Carpentaria, to co-operate with the land expedition.

On the 21st June I left the encampment on the Victoria River, with a party of six persons, viz., Mr. H. Gregory, Mr. Elsey, Dr. Müller, and three men—Dean, Bowman, and Melville.

The arid nature of the country in the interior of Northern Australia compelled us to increase our latitude to 15° S. in order to pass the central parts of Arnheim-land, after which we kept parallel to the coast as far inland as water could be found in the rivers, the greatest distance from the sea not exceeding 100 miles.

Reaching the appointed rendezvous at the Albert River on the 30th August, the schooner had not arrived, and from some marked trees, it appeared that Her Majesty's Ship 'Torch' had sent a boat up the River a few weeks previous, but it was evident that this visit had no reference to the expedition, as the only marks left consisted of the names of some of the crew, which they had amused themselves by carving on the trees and stumps; and the ashes of their fire.

Under these circumstances, I deemed it not advisable to wait the

arrival of the schooner, and having marked trees, and buried instructions for Mr. Baines at a spot which had been previously agreed upon, we left the Albert on the 3rd September, and made some ineffectual attempts to proceed to the south-east, but want of water compelled me to pursue a route parallel to the coast to latitude 17°20' S., when the Gilbert River enabled a S.E. course to be again pursued.

Crossing the Heads of the Lynd in 18°40', we reached the Burdekin on the 16th October. Our route was then along the right bank of that river to the junction of the Suttor River, which was followed up to the Belyando River. Tracing that river to latitude 22°, we then pursued a south-east course to the junction of the Comet and Mackenzie Rivers, and thence our course to the Dawson brought us to Messrs. Connor and Pitt's station, on the 22nd November.

I am now en route to Brisbane, where I purpose to leave the horses until arrangements can be made for their disposal, and proceed direct to Sydney.

(Signed)

A. C. GREGORY,

Commander N. A. Expedition.

To His Excellency the Governor-General.

The PRESIDENT remarked that this was but an outline sketch of the journey; doubtless a much more detailed account would be shortly received.

LIEUT. CHIMMO, R.N., F.R.G.S., said no person could take a greater interest in the paper than himself, as he was sent out in the 'Torch' to leave supplies for Mr. Gregory and his party. But there was one portion of it which he could not allow to pass unnoticed, as it appeared to reflect on the arrangements made by him for the search of that party. Mr. Gregory stated that although he found marks and indications of a party having been in the Albert River, yet he could not ascertain that they came there in search of him. Mr. Gregory's visit must have been rather short, or he would have discovered some of the numerous indications that were left for his guidance. One whole evening—and the evenings were rather long in Australia—two boats' crews were employed cutting marks on trees, hanging up bottles with notices in them on different branches, and one man climbed a cocoanut-tree, the only cocoanut-tree on the river, 63 feet high, and hung a bottle in a conspicuous place. He did not regret that Mr. Gregory's visit was short, because, as it was about the change of the monsoon, his people might have suffered from the serious effects of the climate at that period, on the uninviting and barren shores of Northern Australia.

MR. ROBERT WOOD said he should be exceedingly sorry to say one word that could discourage the interesting endeavour to search for the remains of Dr. Leichhardt. But the accidental circumstance of the Doctor having paid him a short visit at his house at Belmaine, near Sydney, a very few days before starting on the expedition, had put him in possession of Dr. Leichhardt's intentions as to the route he proposed to follow. That route differed materially from the one suggested in Mr. Sidney's paper, and he, therefore, thought it his duty to lay it before the Society. He conceived it necessary to do so, because

he believed that Dr. Leichhardt would under all circumstances follow out this route. He assigned as a special reason for doing so, that it would probably bring him to a tangent with the route formerly taken by Captain Sturt from the southern coast, and he expected to intersect that line at almost right angles by crossing from the east to the west of the continent of Australia. He proposed to start from Moreton Bay, and to diverge slightly to the northwards in penetrating the interior; then, after reaching Sturt's line, to go on to Perth on the west coast. He was accompanied by Mr. Lynd, whose name had been given to one of the rivers on the east coast.

The PRESIDENT asked Mr. Wood whether it was his opinion that, in adventuring westward, Dr. Leichhardt had got lost in some of the saline deserts in the interior?

MR. WOOD was sorry to say that this was his opinion.

MR. HAUG said that the deep interest which he took in the fate of Dr. Leichhardt gave rise to the project which he had the honour to lay before the Council three years ago. If Leichhardt had crossed the track of Sturt, or even advanced more into the interior, it might have been supposed that Mr. Gregory would have come upon some indications of the direction taken by Dr. Leichhardt. Still Mr. Gregory had not mentioned having heard from the natives anything about Dr. Leichhardt. All who cherished geographical enterprise would feel indebted to Mr. Sidney for the plan he had proposed, and he hoped the Council would not be wanting in starting a new expedition for the purpose of discovering something more of the fate of Dr. Leichhardt.

MR. P. L. SIMMONDS observed that he had, during some years past, paid attention to this subject. He well remembered that, in his first expedition, Dr. Leichhardt was given up; and, as in the case of African travellers, he was a little sceptical about the fate of Leichhardt, until more satisfactory proof of his fate had been obtained. Supposing that he did make his way to the westward in the direction he intended, circumstances might have occurred to cause him to diverge in some degree to the northward or the southward of the proposed line of route. Travellers could not always adhere to the plan they laid down for themselves. With regard to the interior of Australia, the means of support were not so hopeless as was supposed, for it was well-known that the aborigines lived on a variety of things produced by the soil. He was glad to see the subject revived, and he could only hope that the Society would not let it drop, without an effort to obtain some definite information as to the fate of the missing party. Taking into consideration the vast extent of Australia, and the slow progress that the party must make, having to find their own sustenance, he did not think the time which had elapsed since the expedition started, should lead to the conclusion that Leichhardt was hopelessly lost.

MR. W. J. HAMILTON, F.R.G.S., rose with considerable reluctance, but having taken a very great interest in the progress of Dr. Leichhardt, and believing that it was now almost hopeless to expect any satisfactory result from the exploration proposed, he should wish—although most unwilling to throw cold water upon any expedition likely to prove useful—before the Society was led away by the hopeful expectations thrown out by Mr. Sidney, to ask a few questions. In the first place, it had always been understood that Dr. Leichhardt would proceed almost in a due west direction from the parallel of Sydney or Moreton Bay. With regard to that point he should like to ask Mr. Sidney where was the point at which the ship was to meet the expedition after one year had elapsed? Next, he wished to know, how it was proposed that the parties composing the expedition, should carry provisions for themselves and fodder for the horses through those arid districts, which constituted the principal feature of the interior? The nature of the country had been sufficiently ascertained to lead to the conviction that, without carrying a very large supply of provisions, both for the men and for the beasts, which would form the staple

of this expedition, it would be impossible to penetrate to any great distance through the sterile regions of Central Australia.

MR. SIDNEY said that they had just learned from Lieut. Chimmo, that Mr. Gregory had even missed the traces of the 'Torch' party, which preceded him a very short time. Therefore, they had very fair reason to conclude that many traces of Leichhardt would also have escaped him, and that up to the present time, no search had been made at all. With respect to the manner in which the proposed expedition should be conducted, he observed that the plan of proceeding was drawn up by gentlemen practically acquainted with the subject, and who were as great authorities on Australian travel, as Kit Carson and Col. Fremont were on travelling in America. As to the point on the coast where the ship ought to meet the party sent in search, it should be selected by the leader of the party. It would be better to leave that to him than to settle it here at home. The blacks, it was well known, could live upon lizards and grubs, and with a pound of flour to each man per day, there would be no difficulty with regard to the support of the party.

MR. GALTON, F.R.G.S.—“Having devoted considerable attention to what I have termed the 'Art of Travel,' I must beg to express my opinion that the arrangements which I have heard proposed this night for an expedition in search of Dr. Leichhardt, and towards the equipment of which the English public is asked to subscribe, do not appear to me to offer any probability of success. I am very willing to grant that the gentlemen who have planned this expedition, may personally be well-qualified explorers, but I cannot think otherwise than that they are far too sanguine and enthusiastic in their estimate of what might be accomplished by the means they propose. In the first instance, they expect to reach in six months a distance which they assume Dr. Leichhardt to have required three years to accomplish. This I think very unlikely. Again, it is proposed to take a caravan of some sixty horses—a number that I believe is very difficult for 15 men to manage efficiently in a broken country. Their estimate, moreover, only professes to allow 1 lb. of solid food (flour) per diem for each man. Human life cannot subsist on 1 lb. of flour per day. Those who are interested in this subject may consult with great advantage the excellent paper by Dr. Christison in the Appendix to the Report of the Crimean Commissioners, where questions of diet are thoroughly gone into and established on a positive basis. By the facts adduced in that paper, it will be seen that at least double the weight of solid food, that it is here proposed to carry, is absolutely essential. Lastly, it is assumed that the track of Dr. Leichhardt still remains so clearly defined, that the proposed party could follow it straight onwards without difficulty or delay. Such might possibly be the case in certain woodland districts, but across most sandy tracts, it is clear that the clue would be entirely broken, and that a pursuing party must, under these circumstances, be prepared to devote considerable time towards recovering it. They would be like hounds slowly hunting on a cold scent, and coming perpetually to fault, while, farther, it must be recollected, that questions of water and of fodder do not admit of prolonged and careful search in desert districts. For these reasons alone, and without entering deeper into the subject, it seems to me, as I said before, that the means proposed for following up the tracks of Dr. Leichhardt are entirely incommensurate with the difficulties of the case.”

MR. SIDNEY said that the black men of the party would pick up food by the way, and partly support themselves.

MR. GALTON.—They would not be able to pick up much sustenance, as they travelled quickly on through a desert.

MR. T. SAUNDERS, in reply to Lieut. Chimmo's assertion, that North Australia was arid, barren, and unfit for human habitation, quoted the opinions of Flinders, Stokes, and Leichhardt, to show that it was just the reverse. He then reviewed at some length the course of Mr. Gregory's expedition, and

maintained that, with reference to the Gulf of Carpentaria, and the south-eastern affluents of the Victoria River, he had failed in the objects entrusted to him. The only thing he had accomplished was to determine the north-west limits of the great desert, as Austin had the south-west limits, and Sturt had the south-east. Mr. Gregory might have waited on the Gulf for the arrival of his tender with supplies, and have employed his time in tracing some of the numerous rivers falling into it, from their mouths to their sources in the interior.

The PRESIDENT, in bringing the discussion to a close, said that Mr. Gregory appeared to have followed the instructions given to him by that most accomplished traveller, Captain Sturt. He had proceeded in two directions to ascertain whether the interior of the country was a saline desert or not. Having satisfied himself on that subject in two or three excursions to the southward, he proceeded to the northward, to mark, as far as it was possible, the nature of the affluents that fell into the Gulf of Carpentaria. Whether he had sufficiently examined them, it was not for the Society to judge until they had received the details of his journey. They all knew it was one of the most remarkable journeys ever performed in that great continent.

With respect to Dr. Leichhardt, he could not entertain hopes of his being found alive, because from all that could be learned, the interior was one vast saline desert; it was only the coast region that was capable of sustaining human life; and if Dr. Leichhardt went to the westward, he must have gone into the saline desert, and probably perished there with all his party.

PROCEEDINGS
OF
THE ROYAL GEOGRAPHICAL SOCIETY
OF LONDON.

SESSION 1857.

Eleventh Meeting, April 27th, 1857.

Sir RODERICK I. MURCHISON, PRESIDENT, in the Chair.

ELECTIONS.—*Major-General A. Alexander ; Dr. Risdon Bennett ; Major-General J. R. Craufurd ; Rev. C. E. Ruck Keene ; Sir George Simpson, Governor-in-Chief Rupert Land ; the Rev. R. C. Trench, Dean of Westminster ; and G. W. Allan ; A. Asher Goldsmid ; H. R. Grellet ; Charles C. Hill ; Richard Hoper ; Austen H. Layard, D.C.L. ; G. A. Lloyd ; Andrew A. Paton ; Edward Purcell, LL.D. ; Thomas Vardon (Librarian of the House of Commons) ; and Charles Verrey, Esqrs., were elected Fellows.*

DONATIONS.—The donations to the Library since the former meeting were very numerous, among which the following more important ones were mentioned :—184 sheets of the Ordnance Survey, completing the county of Linlithgow ; 21 sheets of the Indian Atlas ; 194 charts and other geographical works, presented by the Hon. the East India Company ; 5 additional maps of the Atlas of Bavaria, presented by the Surveyor-General's department in Bavaria ; Reuss and Browne's Map of the Subdivision in and about Sydney and its Environs, in 4 sheets, presented by the authors ; map of the United States, British and Central America, by Professor A. D. Rogers, of the United States, and A. Keith Johnston, F.R.G.S. ; Nos. 9, 10, and 11 of the Royal Illustrated Atlas, by Messrs. Fullarton and Co., of Edinburgh ; manuscript map of South-Eastern Africa, showing the Orange River Sovereignty, &c., by Mr. R. Moffatt, presented through Dr. Livingston ; Memoirs of the Geological Survey of India, presented through Professor Oldham ; Projections of Two-thirds of a Sphere, by Colonel James, R.E. ; Dr. Armstrong's Discovery of the North-West Passage ; maps of the Indian Archipelago and Chile, &c., by J. Bartholomew, Jun., F.R.G.S. ; &c. &c.

ANNOUNCEMENTS.—The President announced that the subscription list in aid of the expedition in search of the Franklin relics, and

towards which 800*l.* had already been subscribed, would be shortly advertised. The Eighth Number of the Proceedings of the Society was laid on the table.

The Chairman then drew the attention of the meeting to the Chinese maps, presented by Consul Parkes, F.R.G.S.

The papers read were:—

1. *Memoir on the Neighbourhood of Canton and Hongkong, and the East Coast of China.* By Sir JOHN FRANCIS DAVIS, Bart., K.C.B., F.R.G.S.

As the seat of the late operations, and the most probable theatre of the future ones, in the existing dispute with China, it may perhaps be of some interest to take a general view of the neighbourhood of Canton and Hongkong, including the whole of the river as far up as the provincial capital of Kuang-tung province. All our troubles since the war (at least, all that have not admitted of a satisfactory arrangement) have been at Canton. Circumstances, which cannot be fully detailed here, have tended to promote both the ill-feeling and the arrogance of the Cantonese. At most of the new ports to the northward the power and the moderation of the British were equally demonstrated during the war, until the growing good feeling of the native population towards their invaders became one of the omens, at least, which induced the Imperial Government to hasten an accommodation with us. Canton, on the other hand, has escaped chastisement, and (as might have been foreseen) attributed this merciful forbearance to wrong motives;—a mistake which the experience of the North has not corrected, because the immense distances and the imperfect means of communicating knowledge (so inferior to our own in Europe) keep the different portions of that empire very much in the dark respecting each other.

A better proof of this almost incurable ignorance could not be adduced, than the account of the English received by M. Huc from a Tartar near Peking, one of a body who had been stationed at Tientsin, to oppose us in case we approached the capital. To the question, “*Vous êtes-vous battus? avez-vous vu l'ennemi?*” he replied, “*Non, il n'a pas osé paraître.*” Les Chinois nous répétaient partout que nous marchions à une mort certaine et inutile. “*Que ferez-vous,*” nous disaient-ils, “*contre des monstres marins? Ils vivent dans l'eau comme des poissons; quand on s'y attend le moins, ils paraissent à la surface, et lancent des “si-koua”* enflammés. Aussitôt qu'on bande l'arc pour leur envoyer des flèches, ils se replongent dans l'eau comme des grenouilles.*”

* Their name for bombshells.

It seems at once good policy as regards the Cantonese, and mere justice and humanity towards the better-disposed populations towards the north-east, that, if a lesson is to be administered, it should be administered in the right quarter. Topical evils require topical remedies: and if we were once more to leave Canton to itself (as we have done before), the question would again be asked, which was so often asked then,—“Why did you not address yourselves to those who had offended you, and were prepared to resist you, instead of attacking us?” At Canton, besides, there is nothing at present to lose, for all trade has left it, and all the foreign quarter is in ruins. The complete capture and occupation of the city and the heights behind by our troops, with Hongkong and its harbour, its barracks and its hospitals, for the base of operations, would at once dispel the delusions of the Cantonese, and supply us with a material guarantee and pledge, as long as it was retained, for all that we have to require from the Peking Government. These two points seem to comprise within themselves the objects of the expedition—that is to say, satisfaction for the past and security for the future; and, as the surest way to the second, the first seems indispensable—viz. the capture and occupation of the provincial city.

Apart from some peculiar disadvantages which conspire to render Canton about the worst place for our trade (a trade which was altogether forced there by the policy of the Tartar Government), that city happens to be placed on one of the finest and most commodious navigable rivers in the world. Some account of this river, and of the islands and principal anchorages in its neighbourhood, with the several points of defence, may be interesting at a time when the public prints contain accounts of naval transactions, and of movements from one place to another whose names and localities are to many unknown.

The whole distance between Canton on the N.W., and Hongkong on the S.E., is about 77 nautical miles, of which 45 extend from Hongkong to the forts at Boca Tigris, and the remaining 32 to Canton. Whampoa, the place of anchorage for trading vessels, is about 10 miles below the provincial city, and this is a great drawback, for in China our trade is always most secure under the guns of our vessels, as at Shanghai and Amoy. Until our war there was only one recognised passage between Whampoa and Canton; but the enterprise of her Majesty's ships in 1840 and 1841 discovered a convenient passage to the south, called Blenheim Reach, from that ship of the line having navigated the greater portion of the way. The principal defences of the river are, first, the famous Bogue forts, which mount some hundreds of very large guns, and, to