

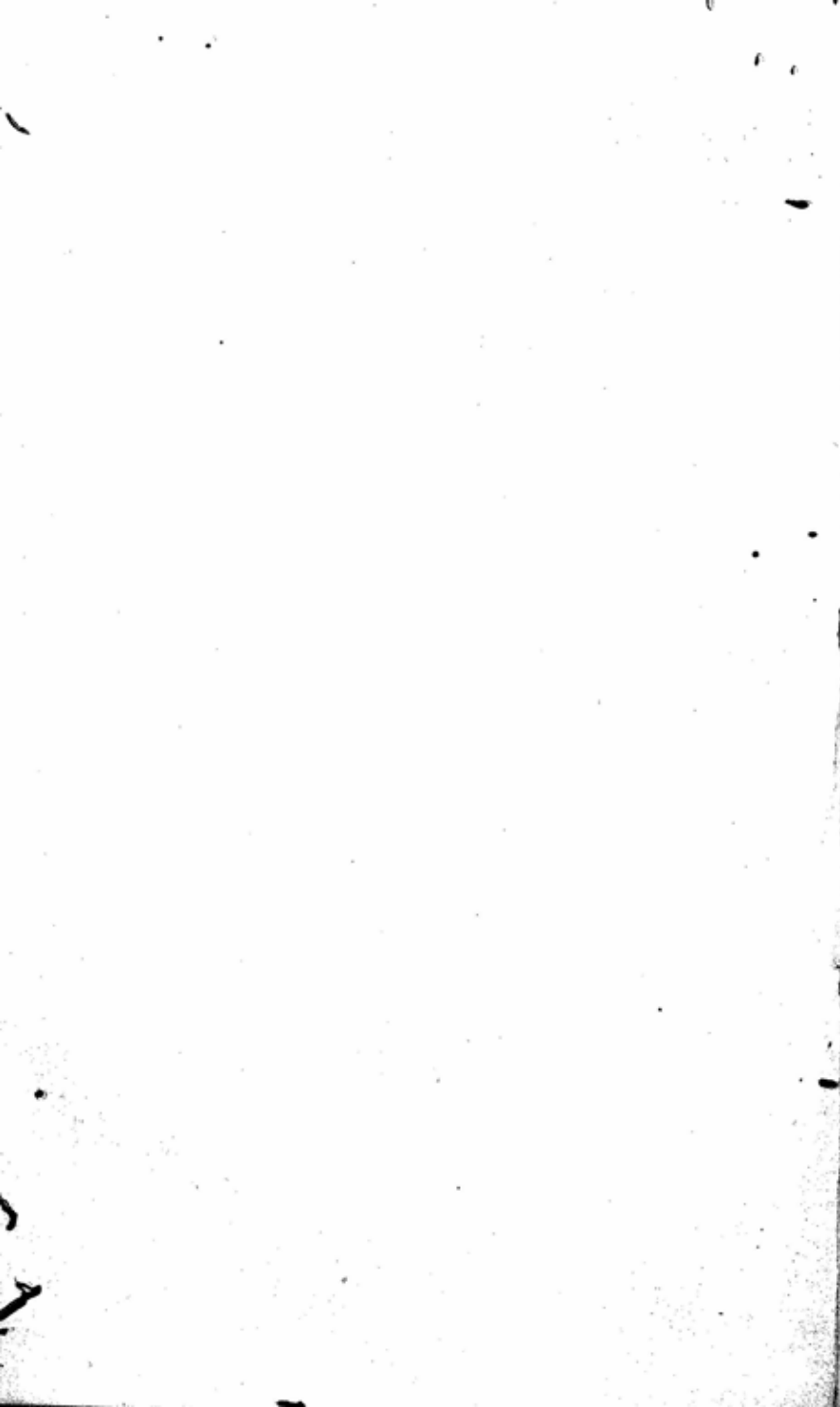
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PROCEEDINGS

OF THE

ROYAL GEOGRAPHICAL SOCIETY.

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VOL. VII.

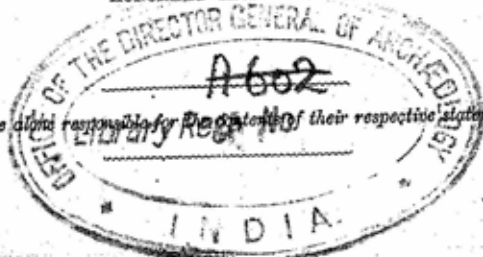
SESSION 1862-63.

Nos. I. to V.

EDITED BY F. GALTON, W. SPOTTISWOODE,
AND CLEMENTS R. MARKHAM,

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N.B.—Home and Foreign Literary and Scientific Societies whose publications are exchanged with those of the Royal Geographical Society, are requested to note the following abstract of the Regulations of the General Post Office with reference to matter sent by Book Post :—

Every packet must be sent either without a cover, or in a cover open at the ends, so as to admit of the enclosures being removed for examination. For the greater security, however, of the contents, the packet may be tied across with string, but must not be sealed, and should have the words "Book Post" marked in legible characters above the address, in all cases in which there is a postal arrangement for the transmission of printed matter between the two countries at reduced rates.

It is also particularly requested that all MSS. intended for publication in the Society's Transactions be written only on one side, for the convenience of printing.

Council of the Royal Geographical Society,

ELECTED 25TH MAY, 1863.

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PROCEEDINGS
OF
THE ROYAL GEOGRAPHICAL SOCIETY
OF LONDON.

SESSION 1862-63.

First Meeting, Monday, November 10th, 1862.

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

ELECTIONS.—*Sir Rutherford Alcock, K.C.B.; Rev. W. B. Boyce; Captain H. Mangles Denham, R.N.; Captain J. George Don Marshall; Commodore Goyens Greville Wellesley; John Peter; H. P. Archibald Buchanan Riddell; John Westwood; and Frederick Woolrabe, Esqrs., were elected Fellows; and thirty-six new Fellows were proposed as Candidates for election.*

ACCESSIONS.—Among the Accessions to the Library and Map-Rooms since the last Meeting were—several splendid Maps of the Austrian Survey, presented by the Vienna Imperial Geographical Society, through the Chevalier de Schwartz; Blakiston's 'Five Months on the Yang-tsze;' Worm's 'Earth and its Mechanism;' United States Reports of Explorations and Surveys for Railroad from the Mississippi River to the Pacific, vol. xi.; Trap's 'Statistical and Topographical Description of Denmark' (in Danish), 5 vols.; Scott's 'Danes and Swedes;' 'Voyage of the Novara,' vols. ii. and iii. (in German); Soldan's 'Geografia del Peru,' vol. i.; Gumpach's 'True Figure and Dimensions of the Earth,' &c.; Transactions of various Home and Foreign Societies; Parts 5, 6, 7 and 8 of Philip's Imperial Library Atlas; Eton College Modern Atlas; 12 Sheets of the Topographical Map of Sweden; 12 Sheets of the Map of Russia; Carte du Liban du Corps Expéditionnaire de Syrie en 1860-61, by the Dépôt de la Guerre; Ethnographical Map of Eastern Europe; Continuation of Government Map of Bavaria; Ethnographical Map of Finland; Carnbée's Atlas; Ordnance Maps and Admiralty Charts, &c.

EXHIBITIONS.—Portrait of Mr. McDouall Stuart, the Australian Explorer, 2 boat-models found in the centre of Australia by that discoverer; Medallion Portrait of the late Mr. W. J. Wills, and Pistol belonging to the same gentleman; specimens of Australian woods; and several Planispheres and Maps, by the Chevalier Ignazio Villa, were exhibited.

The PRESIDENT stated that during the recess a large map of Australia had been prepared; which, while enabling the names of the principal rivers and towns to be seen from all parts of the room, would in some sort be worthy of the remarkable explorations which were taking place throughout that immense portion of our possessions. He congratulated the Society upon the session being opened with papers on that vast continent. It was a continent to which, as a geographer, he had always attached the greatest interest. He admired the Australian colonist for his zeal and vigour, and particularly for his loyalty and attachment to the old country. He made this observation because, somehow or other, it had recently become the fashion to talk of "secession." It was only among a few people, it was true, still the question had been mooted; but he knew perfectly well, from constant communication with friends in Australia, that there was not in any part of the British dominions a people more attached to the Crown and to their mother country than the Australians. He hoped, indeed, that the day was far distant when these glorious colonies should be separated from us. The papers to be read in the course of the evening would include a communication from Sir Henry Barkly; and as there were many distinguished Australian gentlemen in the room—two or more of them who are or have been Governors of these great colonies—he hoped to hear an ample discussion of the subject.

The Papers read were—

1. *The Lower Course of the Burdekin River in Queensland.* By G. ELPHINSTONE DALRYMPLE, Commissioner of Crown Lands in the Kennedy District.

THE author has now completed his examination of the Lower Burdekin River, extending from Leichhardt's Station in s. lat. $20^{\circ} 37'$, E. long. 147° , to its mouth in Upstart Bay, s. lat. $19^{\circ} 42'$, E. long. $147^{\circ} 30'$, including a course of 110 miles. The river is undivided until 15 miles from the sea, when a large branch leaves it on the northern bank, and enters Upstart Bay on the east side of Bowling Green delta; a second similar branch is given off a few miles lower down. The Burdekin is not a navigable river, for even boats cannot ascend it more than 9 miles from the sea. The general character of its bed consists in large reaches of water, alternating with sweeps of red sand, and connected by a shallow stream of 50 feet in width. The whole of the lower Burdekin runs through a richly grassed open forest of the finest pastoral description.

The second Paper read was—

2. *Extracts of a Despatch from His Excellency SIR GEORGE BOWEN to the DUKE OF NEWCASTLE, in reference to the voyage of Captain Norman, and the routes of Mr. Landsborough and Mr. Walker, dated Queensland, March 15th, 1862.*

"I HAVE the happiness to report that Her Majesty's Colonial steamer *Victoria*, Captain Norman, anchored yesterday in Moreton Bay, on its return from the exploring expedition to the Gulf of Carpentaria.

"It will be within your Grace's recollection, that the *Victoria* was to remain for six months in the Gulf of Carpentaria, as the *point d'appui* of the land expeditions commanded respectively by Mr. Landsborough and by Mr. Frederick Walker; the former of which was to accompany Captain Norman by sea in the tender *Firefly*, while the latter was to proceed overland from Rockhampton to the head of the Gulf. Accordingly the *Victoria* left Moreton Bay on the 20th August, 1861, with the tender *Firefly* in company; the latter vessel having on board Mr. Landsborough and his party, with thirty horses, stores, &c. The two ships arrived off the entrance to the Great Barrier reef on the 1st September, but were separated in a heavy gale from the south-east. On the 7th September the *Victoria* found the *Firefly* a complete wreck on one of Sir Charles Hardy's Islands, the crew and passengers, and 27 of the horses, having, however, reached the shore in safety. The *Firefly* was abandoned as past all repair, by her own master, when Captain Norman took the hull in hand, and the crew of the *Victoria* succeeded after great labour in getting it afloat, patching it up, and reshipping the surviving horses. The hull was then taken in tow. In crossing the Gulf of Carpentaria, the hull of the *Firefly* laboured so much that it was feared the horses must be abandoned, and with them the main hope of the expedition. Fortunately, however, the gale, after blowing for 36 hours, went down, when the crew of the hull was reinforced from the steamer, the pumps were cleared, and the leaks kept under, until the *Victoria* reached the Investigator Roads on the 29th September. The trees marked and the wells dug by Flinders nearly sixty years ago, were discovered on Sweer's Island, close to this anchorage. The necessary preparations having been made for disembarking Mr. Landsborough and his party, the horses were towed by the boats of the *Victoria* about 20 miles up the River Albert, where 25 were safely got on shore on the 17th October. The hull was then moored in the stream as a *depôt*. Much labour and care were required to get the disabled and leaky hull up the river, as it appears that in this part of the Gulf of Carpentaria there

is only one tide during the 24 hours, and that high water is always at night.

"On the 16th November, Mr. Landsborough started on his first exploration. He proceeded about 200 miles in a south-westerly direction, towards the centre of the Australian continent, and returned to the dépôt on the 19th January. His Journal reports the discovery of much valuable country. After recruiting his horses and party at the dépôt, Mr. Landsborough again started with provisions for 4 months, on the 10th February, intending to make his way overland to the settled districts of Queensland.

"In the mean time Mr. Walker had arrived at the dépôt on the River Albert on the 7th December, having made his way overland from Rockhampton in 104 days. He proceeded at first in a westerly direction as far as the Barcoo (Mitchell's Victoria) River, when he struck north-west to the Gulf, keeping, it seems, about 100 miles west of Mr. Gregory's track, on the North Australian expedition, of 1858. Mr. Walker was attacked by the natives on several occasions; and it is mentioned that he found "Terry's breech-loading carbines," with which his party had been provided, to be peculiarly serviceable. He also reports the exploration of much valuable territory lying within the western boundary of Queensland, *i.e.*, the 141st meridian of longitude. But the great success achieved by Mr. Walker was in his discovery, on the bank of the River Flinders, of the tracks of Messrs. Burke and Wills, the leaders of the overland expedition from Victoria.

"Captain Norman replenished Mr. Walker's stores with supplies for four months. Mr. Walker started on the 20th December from the River Albert, determined, if possible, to follow up throughout their whole course the returning tracks of Burke and Wills.

"Captain Norman informs me that the mouths of the Rivers Albert and Flinders, like those of most other rivers in Australia, are obstructed by bars, on which there are only 4 or 5 feet of water at low tide, with from 8 to 12 feet rise and fall. Both these rivers, however, are noble streams, navigable for above 30 miles for vessels of considerable burden. In all human probability English settlements will arise on their banks at no distant period, and will form the outlets of the rich pastoral and agricultural country of the neighbouring interior. The climate of this district, though very warm, appears to be very healthy.

"Captain Norman advises me again to press on Her Majesty's Government the urgent necessity which exists in the interests of humanity, and of the general commerce of the empire at large, for the formation of a settlement at Cape York, and for the completion

of the survey of the north-eastern coast of Australia by means of a small steamer. But I have addressed your Grace at length respecting these two undertakings in several previous despatches, stating at the same time how liberally the Government of Queensland is ready to contribute towards the expenses of both."

3. *Extracts of a Despatch from His Excellency SIR GEORGE BOWEN to the DUKE OF NEWCASTLE, in reference to Mr. Landsborough's first Route to the South-West of Carpentaria, dated Queensland, April 12th, 1862.*

"I HAVE the honour to forward herewith two copies of the Journal kept by Mr. Landsborough (the Queensland explorer) on his recent expedition, also a copy of the chart of his route. It will be seen that Mr. Landsborough, starting in a south-westerly direction from the left bank of the Albert River, towards the centre of the Australian continent, penetrated as far as $20^{\circ} 14' 5''$ s. lat., and $138^{\circ} 17'$ E. long., thus reaching a point 250 miles south-east of the point reached by McDouall Stuart on 27th August, 1860, and about 320 miles north of the farthest point reached by Captain Sturt on the 8th September, 1845. Finding no trace of Messrs. Burke and Wills (to search for whom was the primary object of the expedition), Mr. Landsborough returned by a somewhat different track to the depôt on the Albert River. It has been truly observed, in an Australian publication, that the 'cheerful alacrity with which he resumed his arduous labours, the moment his party had been strengthened and provisioned, proves that his heart was in his work.'

"The country traversed by Mr. Landsborough on his recent journey consisted at first of thinly-wooded and well-grassed plains, which were suffering from drought at that period of the year (height of summer), but which bore marks of being occasionally inundated: Farther on towards the interior the travellers, after crossing some basaltic ridges overrun with desert-grass, came upon fine open plateaux, lightly timbered and covered with rich pasture, to which the name of "Barkly Table-land" has been given, in honour of the Governor of Victoria. Much of the upland as well as of the lowland country is reported as well suited for cotton cultivation, while vast tracts are admirably adapted for pastoral purposes. It has been suggested that, inasmuch as the rainfall on the north-eastern coast of Australia occurs at a season when the territory skirting the southern portion of the Gulf of Carpentaria generally appears to suffer from drought, it is probable that a

system of migratory settlement may hereafter be adopted with advantage to the flocks and herds which will eventually occupy both regions. A belt of table-land would seem to stretch from east to west between the 18th and 19th parallels of south latitude; and in the mountain barrier which separates it from the plains of the seaboard are the sources of most of the affluents of the Albert, Nicholson, Flinders, and of the other rivers flowing into the Gulf. Messrs. Burke and Wills, as well as Mr. Landsborough, crossed this table-land, and were much struck with the beauty of its landscape, the richness of its vegetation, the amenity of its climate, and the indications which it presents of the existence of mineral wealth. Although it is within the tropics its elevation is sufficient to insure a mild temperature; while the peculiar formation of the country, with deep basins surrounded by chains of hills, would render comparatively easy the construction of reservoirs to hold the great annual fall of rain. On the whole, this region holds out the promise of being ere long overspread by that tide of population which is gradually creeping up the eastern seaboard of Queensland, and which will naturally flow round towards the Gulf when it reaches the York Peninsula.

“The projected establishment of a settlement at Cape York, and the proposed temporary annexation to Queensland of the territory sketched above, will vastly accelerate its colonization by securing to the intending settlers the advantages of certain communication, of armed protection, and of regular civil government.”

4. *Extracts of a Despatch from His Excellency SIR H. BARKLY to the DUKE OF NEWCASTLE, in reference to Messrs. Burke and Wills, Mr. Landsborough, Mr. Walker, Mr. Howitt, and Mr. McKinlay, dated Melbourne, April 23rd, 1862.*

“I AM happy to be enabled to state that Her Majesty's colonial steamer, *Victoria* has since returned from her voyage, bringing the most satisfactory account of the operations both of the party under Mr. Landsborough, which she carried round from Moreton Bay, and of that under Mr. Walker, which travelled overland from the Fitzroy River, and reached the appointed rendezvous on the Albert early in December, after discovering traces of Mr. Burke near the mouth of the Flinders, the river he was supposed to have struck.

“A full report of this most important and interesting journey will be found in the Parliamentary Papers which I enclose; as also of the expedition to the South-west, on which Mr. Landsborough, as

arranged, started shortly after arriving in the Gulf, and from which he was driven back by want of water at the end of three months, after penetrating about 200 miles. A map of both routes is appended to the Reports.

"Ignorant of the fate of Burke and his companions, Mr. Walker, of course, lost no time, after replenishing his stores, in returning to the Flinders with the view of following up the tracks he had found, whithersoever they might lead him. He left on the 20th December, and has not since been heard of; but as he had five months' full rations, and expected it would take him four at least if he had to go the Cooper Creek Dépôt, there is no reason to fear as to his safety. On returning from his attempt to reach McDouall Stuart's tracks in the south-west, Mr. Landsborough likewise felt it his duty to proceed in quest of Burke, although Captain Norman of the *Victoria*, who had been placed in command of the whole expedition, was very reluctant that any needless risk should be run, and gave his assent solely on the ground that the first party might possibly miss the trail.

"Mr. Landsborough would leave the Albert about the middle of February, and cannot therefore be looked for until two months hence, unless, following an erroneous idea which he seems to have imbibed, that certain tracks seen far to the eastward by Messrs. Cornish and Buchanan, of Queensland, were those of Burke (instead of, as is far more probable, notwithstanding the lapse of time, those of Leichhardt), he finds his way back to Brisbane without coming to the dépôt on Cooper Creek at all.

"To guard against every contingency, however, instructions have been sent to Mr. Howitt to remain at that spot until tidings as to the safety of both the return parties from Carpentaria are obtained: and as that gentleman has skilfully contrived to open up communication with the out-settlements of South Australia, from which he is enabled to procure ample supplies, there is no doubt of his holding his ground till directed to retire.

"At the date of the last accounts he was about returning from Mount Hopeless to endeavour to ascertain what had become of the expedition under the South-Australian leader McKinlay, which has not been heard of since January; and as he has established most friendly relations with all the Cooper Creek tribe of aborigines, there is every prospect of his being able to afford aid if needed.

"Your Grace will thus perceive that the country between Lake Torrens and the Gulf of Carpentaria is likely to be thoroughly explored in almost every direction; whilst the further it is examined the less reason there appears to be to suppose that any great por-

tion of it is hopelessly barren, or even ill-suited for pastoral purposes. Walker passed through much rich volcanic soil; whilst Landsborough describes even the poorest and driest he traversed as "fair sheep country."

"It only remains that I should notice the highly valuable Report made by Captain Norman himself on the whole expedition, including his ascent of the Flinders River in boats for nearly 50 miles; and it will be impossible, I am sure, to peruse his Journal without perceiving, in spite of the modest and plain language in which it is kept, that to the prudence, energy, perseverance, and skill of this officer the successful issue of the voyage and the safety of the exploring parties are mainly due.

"But for the exertions of himself and those under his orders in getting off the *Firefly* tender when wrecked in Torres Straits, and towing her round to the Gulf, the horses on board must have been lost, and the designs of Mr. Landsborough frustrated; whilst to his timely forethought, in at once putting all hands on reduced rations after the delay and loss of stores occasioned by this accident, is solely to be attributed his ability to keep his ship a month at least longer on the berth than was anticipated, so as to admit of that gentleman's return to the Albert, and also his being enabled to supply both expeditions with fresh supplies for a five months' return journey overland."

5. *Extracts of a Despatch from His Excellency SIR GEORGE BOWEN to the DUKE OF NEWCASTLE, in reference to Mr. Landsborough's arrival at Menindie, and Mr. Walker's arrival at Port Denison, dated Queensland, July 8th, 1862.*

"I HAVE the honour herewith to transmit a copy of the letter in which Mr. Landsborough, the Queensland explorer, reports his arrival in the settled districts of New South Wales, with the entire party under his command, 'in safety and in good health,' after having crossed the Australian continent from the Gulf of Carpentaria.

"This eminent success will be most important in its results to the progress and settlement of this colony, while it is very gratifying to myself and to the members of my Government, as Mr. Landsborough (a resident for many years past in Queensland) was selected by us, and his equipment and instructions were prepared under our personal directions and supervision. The safe return of this exploring party and of that under the command of Mr. Walker (which reached Port Denison in Northern Queensland a short time back) are also subjects for general congratulation. It will be remembered

that the primary object of both expeditions was to search for Messrs. Burke and Wills, the Victorian explorers; and it would have been sad indeed if the Australian wilderness had swallowed up fresh victims, and especially if men had perished while seeking for other men who had been already long dead.

"Mr. Landsborough's triumphant and comparatively easy success proves, moreover, that for Australian exploration a practical 'bushman' as leader, and a lightly-equipped party, are to be preferred to costly and unwieldy preparations. Some judicious remarks have been published by a perfectly impartial witness, a public writer in the colony of New South Wales, which bore no small share in the recent expeditions. They are as follows:—'Few disasters have happened to expeditions headed by practical bushmen. Experience seems to show plainly enough that that sort of ability which is only to be acquired by long residence on the outskirts of civilization is, after all, the best qualification for an explorer. Scientific knowledge, courage, and enthusiasm, are excellent qualities; but, even when possessed to the full, they do not compensate for the absence of practical experience of bush life.'

"It has been farther remarked, with equal truth, that since the lamentable fate of Burke and Wills had left no object to be gained by following their footsteps, it is a subject for congratulation that both Walker and Landsborough failed to trace them; for by the independent journeys into which the last-named explorers have thus been diverted, they have added largely to our previous knowledge of Australian geography. Landsborough's route lies intermediate between those of Burke and Walker. Five separate routes have now been traced from the settled districts to the head of the Gulf of Carpentaria; those of Leichhardt and of Augustus Gregory by the valley of the Burdekin; that of Walker from the River Alice on the Western water-parting; that of Landsborough more westerly still; and that of Burke from Cooper Creek to the River Flinders. When what is now known of the interior of the North-eastern quarter of the Australian continent (forming the territory of Queensland) shall have been fully delineated, there will not be much blank space left on the map of this colony. 'The main features of the physical geography of this district have now been determined, and all that remains is to fill in the details. This will soon be done by the squatters, who have before them the encouraging assurance that the land is well grassed and sufficiently watered. Grass and water—these are the two great requisites for pastoral occupation. Let these be furnished, and Australian colonization can enter upon its first phase.'

"The able writer from whom I have already so largely quoted sums up thus:—'The process of discovery has been expedited, first, by the successful journey of Burke and Wills, and, secondly, by the two expeditions that were sent out to look for them before their untimely fate was known. The result has been to show that Queensland possesses an immense range of good pastoral country, and, as the laws hold out sufficient inducement to squatters to take up the land, the future prosperity of that colony is placed beyond all doubt. In fact, there appears to be no large amount of desert or sterile country within its territory. There are considerable patches of "scrub," of sand, and of stony ground, but nothing that is worthy of being called by the name of a desert.'

"On the whole, the recent discoveries have not only opened a safe and easy route from the already settled districts of Queensland to the new territory lately annexed to its north-western boundary (between the 141st and the 138th meridians of longitude), but they have, in fact, practically added to the known resources of the British empire in Australia millions of acres, presenting a fresh and noble field for English capital and enterprise."

The PRESIDENT said this Expedition of Mr. Landsborough was projected in Victoria, at the suggestion of the Governor, Sir Henry Barkly. The despatch of Sir George Bowen described the remarkable journey which Mr. Landsborough afterwards made from north to south, completing, for the first time after the great Expedition of Burke and Wills in the previous year, the extraordinary feat of traversing entirely the continent of Australia. In mentioning the names of Burke and Wills it was his duty to say, though Burke was at the head of the Expedition, that equal merit was due to Wills, as a daring, adventurous, and successful explorer. The Gold Medal of the Society was awarded to the representatives of Burke, for it could only be given to the head of the party; but at the same time every geographer felt that a medal was equally due to Wills, as the astronomer and geographer of the Expedition. He had obtained the consent of the Council to write to the father of Mr. Wills, stating expressly their conviction upon this point, and the regret that they had not two medals to give, or they would certainly have presented one to Wills.

The PRESIDENT then read portions of a letter from Sir Henry Barkly, under whose government the Landsborough Expedition from Victoria emanated. It was from this colony of Victoria that Captain Norman was sent with two vessels round to the Gulf of Carpentaria. That was the commencement of the series of successes of which they had just heard the details. In his letter Sir Henry Barkly alluded to the reception of the present of a gold watch, which the Society made to that fine old soldier, King, the only survivor of the Expedition of Burke and Wills.

The PRESIDENT added that he had taken the liberty of informing the Premier of the existence of Cape Palmerston in Queensland, of which his Lordship was not cognisant; and, as two important rivers had been discovered to the north of it, he begged to call their attention to the spot. With regard to the observation immediately preceding, he was happy to see present Sir Richard McDonnell, the Governor, who had recently returned from South Australia; and he would ask him to explain the objects he had in view in

sending out Mr. McKinlay, who appeared to have deviated from the instructions he had received, and, like a true bushman, to have found his way through in a different direction. They had heard in the course of the evening of the great exploration of Stuart, which also took place under the auspices of Sir Richard McDonnell. That explorer was the first to reach the watershed of the north, but he did not absolutely reach the sea. He understood that Governor Kennedy, of Western Australia, was also in the room. It was under his government that Frank Gregory made most remarkable explorations on that side of the continent. Though the subject of Western Australia had not been touched upon, he hoped Governor Kennedy would give them some account of what had been done in that colony, so that they might have in one view the great additions to our geographical knowledge which had been made by these various adventurous explorers.

SIR RICHARD McDONNELL, late Governor of South Australia, said, in reference to the excursion of Mr. McKinlay, it appeared from a telegram lately received that that gentleman had come out on the east coast of Australia, near Rockhampton. The instructions to Mr. McKinlay were that he should, after an exploration from Adelaide to the east, make for Central Mount Stuart; then he was to examine the west of Lake Gregory, and to search in the adjacent country for gold, which Mr. Stuart had stated was likely to be found there; he was then to return to Adelaide if he met with Mr. Stuart, whose destiny was now a subject of very great anxiety, and if he did not meet him near Central Mount Stuart, he was to return south to Adelaide. It was only fair to anticipate that McKinlay, who was a very able and experienced bushman, would be able to give very good reasons for his deviation from the route which it was intended he should follow.

He might observe with reference to the name of Stuart, which is given to the mountain that was considered by its discoverer, Mr. Stuart, to occupy the most central point of the continent, it was a proof of the modesty which is so often allied to true greatness, that when Mr. Stuart brought the map to him he called it "Mount Sturt." He, however, thought it was only fair, as he did not see Stuart's name upon any part of the map, that he should insert another letter, and give this mountain the name of Stuart.

The Papers which he had heard read had brought most vividly and satisfactorily to his mind a truth, of which he had long been convinced. He knew there had been great advocates for a desert in Central Australia, and great advocates for large central seas; but he thought that, before the light of recent experience and increased knowledge, both the deserts and the inland seas were fast disappearing. He was surprised to read in Australia some accounts of the proceedings of this Society, in which great stress had been laid on the magnitude of an inland sea reported by Mr. Stuart, which was in his opinion identical with Lake Gregory, and was part of Lake Torrens, the original horseshoe lake that Mr. Sturt gave upon his map. Mr. Stuart had now left on a great expedition, the entire cost of which was defrayed by the South-Australian Government, on the condition and understanding that all maps and charts, and in fact everything of discovery connected with it, were to become the property of the South-Australian Government; and he was very naturally surprised to find that in London there were many persons who possessed the information of the existence of a large inland sea, with which the Government, who had fitted out Mr. Stuart, were totally unacquainted. He imagined that that inland sea was fast drying up: in fact, he did not see any great reason for the advocates of the inland sea to congratulate themselves upon it; it is a mere depression of land which at one time was found by Mr. Goyder full of fresh water, and at another time by Mr. Stuart and others just a basin, with a little liquid brine in the centre. No doubt at one time, as the members of the Society were well aware, it was supposed that there was a large horseshoe around the inhabited

and settled districts of South Australia, which barred all ingress into the interior, and that to advance into it was to advance into a region of slush, liquid brine, and mud. All this has disappeared. We now knew of three crossings over it. He had himself crossed over and had gone a considerable distance north, and he was one of the first that went across. It had long been a matter of great interest to him to know what was in the interior of Australia, and, as far as he knew, it was neither that rich country nor was it so barren as many had been in the habit of supposing. There were, however, materials enough for the development of wealth hereafter; but he imagined that development would be slow, from the purely pastoral character of the country. He would advert to a fact in which he felt a just and natural pride, namely, that the Government of South Australia, with which he had recently been connected, was the first to give life and impetus to those movements which, commencing with the explorations of Mr. Stuart, had been succeeded by those of Burke and Landsborough. It was to the colony of South Australia, neither so wealthy nor so populous as Victoria and New South Wales, that we were indebted for this new movement, for there had been an apathy about these matters since the explorations of Mr. Sturt many years ago. The instructions given to Mr. Stuart by the South-Australian Government, which differed widely from those given by the colonists of New South Wales and Victoria to their explorers, were that he should make his way to the Victoria River, and not towards the Gulf of Carpentaria. He might appeal to their common sense whether it was not of very great consequence to this country, to open a direct route by the island of Timor with our Indian possessions, in connection with a river which is more navigable than any to be found at the Gulf of Carpentaria. The distance was many hundred miles shorter between Victoria River and Adelaide, and there was a large amount of stock ready to cross the continent, consisting of cattle, sheep, and horses, which have become great articles of commerce with India. It was evident by a reference to the map that it was much easier to pass up Lake Gregory to the Victoria River than to take the cattle and sheep to the Gulf of Carpentaria, from the shores of which there was a long and somewhat dangerous navigation. If cotton was to be grown in any part of Australia with success, it would be eminently so in the neighbourhood of the plains near the Victoria River, which were exceedingly fertile in consequence of an alluvial deposit; and he had no doubt, if a communication with India were established, that part of Australia would become the site of a very flourishing colony. The Society should bear in mind that South Australians had always had before them the idea that their explorations should connect Adelaide with Victoria River. It could not be denied that they were moved to these considerations somewhat by motives of self-interest, and he had no doubt the South Australians thought that eventually they might establish a telegraph, by the nearest route to the Victoria River, with India and Europe, much more readily than by the circuitous route which has been before the public for some time. When that plan was read before the South-Australian Government, he had influence enough with its ministers always to say, "When we see the reason why we cannot go straight across the continent, we will then consider why we must go two or three thousand miles round." He hoped, on Mr. Stuart's return, he would be able to satisfactorily prove the practicability of the scheme to which he had alluded.

He had heard with very great pleasure an observation which had fallen from Sir Roderick, to the effect that he could not understand any people in this country talking of a severance from colonies which had always manifested the most loyal disposition towards the mother country. Having administered the government of several of Her Majesty's colonies for the last thirteen or fourteen years, he must say that nothing was more painful to his feelings than the levity with which that subject had been treated by some of the highest in the land. In the Australian colonies there was a depth of feeling and a depth of affection

for the mother country, which was in no way better evinced than when there was suffering at home, to the relief of which the colonies were always so ready to subscribe. If the colonies did not add to the power and strength of this country, it would be simply because our statesmen did not know to avail themselves of them. It would not be the fault of the colonists, but the fault of those who ought to be able to make use of the connection in a manner to increase the power of the mother country, by uniting in one common brotherhood the different members that compose this great empire. He assured the Society that nothing could be more untrue than that there is any talk in Australia of severance from the mother country: they never discussed such a subject—nothing could be more unpopular. If any one were to broach such a subject, he would be scouted by every one. It was only at home, he said, and occasionally in Parliament, that such things are mentioned. He must say, having filled the responsible position he had for so many years, he was happy to embrace this early opportunity of expressing the great pleasure with which he had heard the President make that observation, and the great pleasure with which he had listened to their expression of sympathy with that sentiment.

SIR CHARLES NICHOLSON, Bart., said that during the last eleven months he had had an opportunity of visiting a portion of the north-east coast, as far as the new settlement of Port Denison. This was the extreme northern point of colonization on the eastern coast at present. The progress of settlement in Queensland along the coast had been very rapid and was most encouraging. A most magnificent country had been discovered, and the estuary of two or three rivers had also been lately traced. It was thought when Mr. Dalrymple fell in with the Burdekin, that a navigable mouth of the Burdekin might be found somewhere about Cape Upstart; but it had since been ascertained that the estuary of the river consisted of a number of small branches, not any one of which was navigable by a boat. However the country around Port Denison is exceedingly fine, consisting of rich pastoral and open forest-land. He was there in December last, and he saw a party of young squatters who had been exploring as far as the table-land behind Rockingham Bay, what is called Leichhardt's Basaltic Table-land, about 100 miles to the west of Rockingham Bay. They had been absent five months in making this exploration, accompanied by a black boy, and of course they had to undergo a great many trials during that period. This, however, was a matter of course with those who are occupied in searching for runs. There was no doubt that the most successful explorers are the old bushmen who have been so engaged.

One of the most interesting tracts lately opened up is the valley of the Fitzroy. The Fitzroy River is certainly the largest tidal river that has been discovered, with the exception of the Victoria in the north-west, in any part of Australia. The Victoria River drains a tract of country of not less than fifty millions of acres, and the whole of that country is of the finest possible description.

Sir Richard McDonnell had just suggested that the great field for the growth of cotton was likely to be on the north-west near the Victoria River. Possibly that might be the case; but certainly a finer country and one better adapted for the growth of cotton could not be found in any part of the world than in the central and northern parts of Queensland. He might observe, as an interesting fact, that the growth of cotton is no longer a speculation in that country. There are now 200 bales of cotton shipped at Moreton Bay, which are expected daily in England. The legislature of Queensland had shown a most commendable anxiety to promote in every way the cultivation of this great staple, and in doing so they had perhaps transgressed against some of the maxims of political economy. For instance, they had offered a bounty of tenpence a pound upon sea-island cotton, and fivepence a pound upon all common cotton that might be grown in the colony within the next two years. The only thing the colonies are deficient in is the common want of labour.

With reference to the Papers which had been read, he would venture to ask Sir Richard McDonnell whether he was quite satisfied as to the fact of Stuart having reached the extreme point to the north laid down in his journal, because Mr. Landsborough and many of the best judges in Australia had very great doubt as to his having reached that point. He had been informed that Mr. Stuart was not expert in taking observations, and that, in point of fact, his calculations were formed on the mere "dead reckoning."

SIR RICHARD McDONNELL said he must state at once that Mr. Stuart is an accurate observer, and is considered one of the best practical surveyors in South Australia. He was brought up to the profession.

SIR CHARLES NICHOLSON, in continuation, said he differed from Sir Richard McDonnell as to the route he had indicated being the great highway from India to Australia. He believed the only mode of access into the interior will be by following the dividing range. Now, one of the great results of Mr. Landsborough's journey was this: he demonstrated that the great eastern coast range, instead of being limited in the north to Cape York, bifurcates and extends towards the north-west, forming the watershed of the rivers which flow into the Gulf of Carpentaria on the north, and of the affluents of the Darling on the south. It is by following that dividing range, a great portion of which consists of open forest-land fit for pasture, that he believed will be made the great high road between West Australia and Australia generally, and India; because certainly, from the evidence we had of Mr. Stuart's account of the land, the country he passed through, if not a desert, is of a very unpromising character. There is a great deficiency of water, and it is a country not likely to be available for the transit of commerce or passengers. It is an unfortunate circumstance that none of the rivers which flow into the Gulf of Carpentaria are navigable. They all have bars at their mouths, and are consequently inapplicable to the purposes of commerce.

The Legislative Council of Queensland were very anxious to establish a settlement at the head of the gulf, and they obtained all the evidence available upon the subject. It appears that the greatest depth of water at the bar of the Albert, Nicholson, and Flinders, and of all the rivers that flow there, does not exceed 5 feet, and that the only safe anchorage is in Investigator Straits, just off Wellesley Island. He quite agreed with Sir Richard McDonnell, that the most eligible and interesting spot to which the attention of colonists should now be turned is the valley of the Victoria River. Looking to its proximity to India, to the fact that it is undoubtedly the largest tidal river in that part of the north coast, that the tide there rises some 30 feet, and that according to the evidence of Mr. Augustus Gregory there is a fine country there, it is most desirable that steps should be taken with a view of determining its character and forming a settlement in that place.

The Government of Queensland were quite alive to the interest attaching to all these great questions, and he believed that at this moment Sir George Bowen, influenced by the representations made at the instance of the Geographical Society, was at Cape York, with the view to form an establishment there. In this way the whole of the east coast might be said to be more or less occupied. It was proposed by Mr. Herbert, the Colonial Secretary of Queensland, who was now in England, that the local Government should form another establishment in Rockingham Bay. That would form the extreme settlement at present, the next point being Port Denison. One additional point of occupation between Cape York and Rockingham Bay would complete the chain of settlements, so that steamers could navigate the whole distance, and take in a supply of coal; in short, open up the whole of that coast.

He might also mention another fact with reference to the line followed by Burke and Wills. There are certainly some doubts whether they were quite so far to the west as they represented. Mr. Landsborough told him just before

he started on his expedition that he had fallen in with their tracks on some former excursions of his, made on his own private account, at a point to the east of the 141st meridian, and his impression was that they were much further to the east than they believed themselves to be.

He would just take the opportunity of adding his tribute of admiration for the zeal and ability of Mr. Landsborough. Among Australian discoverers he was as an explorer *facile princeps*. He had been engaged for years in bush-life; he had been out for months together, simply with a black boy, searching for country; and he possessed in every respect those qualities which are calculated to fit him for the task of the most difficult explorations.

He ventured, with great submission, to subscribe the impression of his opinion as to what had been said by Sir Richard McDonnell with regard to the feelings of attachment entertained by the whole of the Australian colonies towards the parent state, and the deep regret which he, in common with others, felt at hearing the speculations indulged in by various persons in England as to what can hardly be otherwise regarded than as a dissolution of the British empire. It was nothing more nor less than a proposition for abandoning those colonies in which there is as much loyalty and deep affection towards the institutions of England as there is in any part of Britain itself. He had been in Australia twenty-five years, and such a thing as separation was never alluded to in the colonies. It was only when he came to England that he heard gentlemen in high office and holding distinguished positions propound these theories, which, he was glad to say, are not in any degree responded to by the colonists.

SIR STUART DONALDSON said he was not going to take the part of South Australia against the North, or of Queensland against Victoria; but there had, in the course of the discussion this evening on Australian discovery, been what appeared to him a *casus omissus*, which they ought not to separate without noticing. Among the explorers to whom so much credit was due there was one name which had not been mentioned—that of the unfortunate Leichhardt. With all due respect to those whose names would no doubt become immortalised, he thought the name of Leichhardt ought not to be forgotten. He recollected the colony long enough to remember when Leichhardt went out—unaided by Government, with nothing but private subscriptions and his own indomitable pluck to guide him through the untrodden wilds of the North-Western interior—on an expedition in 1846. He was lost, to all appearance, and for eighteen months was never heard of. He not only went from the centre part of Queensland right up to Cape York, but he descended again to the south along the peninsula; he coasted the Carpentaria Gulf, and then went across all the northern watershed which empties itself into that gulf, until he arrived at Port Essington, where he was first discovered to be alive. His track, on the map, would appear three times the length of any except Landsborough and Stuart's, but it had not even been mentioned during the discussion. He desired to rectify the omission. He could not forget the sensation in the colony when it was thought Leichhardt was lost, nor the joy that prevailed at Sydney when the news came, "Leichhardt is alive!" Again he started from New South Wales, resolved to cross the entire continent or perish in the attempt, and has never since been heard of. Now that he was no more, the couplet of the poet on the possibility of finding Leichhardt's grave seemed to him to be singularly appropriate under present circumstances:—

"How shall the pilgrim hail the hour,
Beneath the drooping myall's gloom *
To sit at eve and watch an hour,
And pluck a leaf on Leichhardt's tomb!"

He felt he could not sit still and hear all these encouraging eulogies on modern

* *Myall*, the scented tree known as "violet wood."

explorers without alluding in a few words to the honour and glory of the man who, under great difficulties, and with no one's track to assist him, was one of the greatest and most successful explorers in the whole of Australia, and intreating this great assemblage, while honouring the living, not to forget the lost Ludvig Leichhardt.

The PRESIDENT begged to assure Sir S. Donaldson that before the next meeting the line of Leichhardt's route would be properly delineated on the map. And when delineated it would be seen that his excellent friend had somewhat exaggerated the amount of exploration of that most illustrious traveller. Leichhardt had received the gold medal of the Society, which would show the high estimation in which he was held by us. Besides Leichhardt, the name of Sturt had not been mentioned in the papers which had been read; and, for his own part, he considered Sturt one of the greatest of Australian explorers. They had not gone into the whole history of Australian exploration, but were confining their attention to the labours of Landsborough and Stuart.

MR. KENNEDY, the Governor of Western Australia, observed that he had lately returned from that almost unknown part of Australia called Western Australia, a district which, he believed, could justly boast of being less known than any other part of her Majesty's dominions. He expressed his regret at being unable to add much to their information respecting that portion of Australia; but this ignorance of Western Australia was no fault of his, for during the time he held the reins of government there had been no less than three explorations, more or less important. The first was undertaken towards the eastern district, directly from the west to the east, to the place called Mount Kennedy. That was carried out by a very enterprising band of young settlers, and they found a very fair country in that direction. Up to that time—and that was a matter of a year or a year and a half ago—it was believed that that part of the country was barren and unfit for settlement. He had, however, come to the conclusion (which was wholly the reverse of what had formerly been currently believed) that it was a fair country, and fit for settlement. Another exploration farther to the west and north was undertaken by Mr. Frank Gregory up the Gascoigne. During that expedition he discovered some very fair country. The same gentleman, within a very recent period, attempted to join his exploration from Nichol Bay with that towards the centre of Australia, reached by his brother, Mr. Augustus Gregory. He, however, failed in this attempt. But what he discovered had been fully placed before the Geographical Society by Mr. Gregory and by the official reports. Mr. Kennedy added, he had no doubt that a very large portion of that unknown tract would turn out to be perfectly suitable for settlement and habitation; and that, in all probability ere many years had passed, that now almost unknown part of Australia would become the happy homes of thousands of Englishmen.

Western Australia was generally supposed to produce very little; but he might be permitted to inform them that among other things it had produced those two very remarkable explorers, Mr. Frank Gregory and Mr. Augustus Gregory. If not born there, at all events they had been reared and educated in the colony. They learned their craft there before Mr. Augustus Gregory went farther east, and explored towards the Gulf of Carpentaria. He is now placed in a position in Queensland which no doubt would be occupied by him with honour to himself and advantage to the colony.

Western Australia had some very particular traits. They had succeeded in doing, what there was a very strong popular disbelief in in this country—they had turned thieves into honest men. He believed it was the only place and the only means by which such characters could be reformed. It was by a very simple process—because there was nobody to rob and nothing to steal. It was a known fact that upwards of 6000 or 7000 of these characters had been introduced into that part of Australia; and it was a fact which could be

vouched by statistical reports and records of the Colonial Office, that the percentage of crime was as low there as in any other part of Her Majesty's dominions. This arose from the simple reason that these men are compelled to work; compelled to earn their bread; and they had plenty of room to do so. If they had possessed the same advantages in this country, he believed a very great majority of them would never have been criminals at all. Western Australia also produced a remarkable kind of oyster, specimens of which he was happy to lay before the Society, and he was informed that their commercial value was about 140*l.* per ton. He believed if these could be imported into this country, and a commercial relationship of this kind established, that Western Australia would be almost as valuable as the gold districts of Australia. That the Western part of Australia was less rich than others was perfectly true, but he could assure the Society that there were many instances within his own knowledge of men who had struggled hard in this country for an existence—men of the very lowest class—who had succeeded in nine or ten years in obtaining 800*l.* to 1000*l.* a year for their clip of wool. In Western Australia there is plenty of room for labour, and it only required that part to be better known to encourage a larger emigration. Her Majesty's Government had always been most liberal in that respect. It was true they sent convicts, because the colony wanted them, but they at the same time sent as many free men and free women, which counterbalanced the convicts; and, as long as that was satisfactory to this country it would be satisfactory to these colonists: there is plenty of room for ten times as many.

He would just say one word in conclusion, and that was in corroboration of his friend Sir Richard McDonnell, that there is not in that country, as far as he knew, a shadow of a desire for severance from the mother country. He had never been in any part of the world where there was a deeper and more devoted loyalty than in that part of Australia which he had had the honour to govern. He had never heard a dissentient voice upon the subject; but on the contrary, whenever Her Majesty's name had been mentioned, it had always been received with as much enthusiasm as it would be in any assembly of Englishmen at home. He could not understand upon what ground it would be advantageous to have a noble country like that severed from the parent State in the days of its infancy. Such an agitation and such a proposal ought to be deprecated by every sane and honest man in this country. Australia, even as an outlet for our superabundant population, was invaluable; and by a proper and judicious management, by giving the Australians that which Her Majesty's Government, of whatever politics, had hitherto given them—fair play and right of self-government—he had no doubt that they would be as long and as warmly attached to the British Crown as any dependency which owns her sway.

The PRESIDENT expressed his regret that, owing to the late hour, they could not have the pleasure of hearing Colonel Gawler, whom he intended to have called upon, with regard to the question of separation from this country. If it had been stated that some person high in office had given expression to such a sentiment, he knew that Mr. Herman Merivale, the Under Secretary of the Colonies, had read an admirable paper before the British Association for the Advancement of Science, at Cambridge, in which he showed the utter futility of the notion of separation, and how injurious such a separation would be to the mother country. Mr. Merivale had argued the question upon broad statistical grounds; and, for his own part, he was happy to find, from all the authorities who had spoken, that there was not a seceder in the great continent of Australia.

Before adjourning the meeting, he must beg to congratulate them upon having had this interesting discussion on the anniversary of the birthday of the Prince of Wales. He mentioned this circumstance because His Royal Highness was the only heir-apparent—at least within the reach of his recollection in history

—who had made himself so good a geographer by his extensive travels. It was, therefore, well that they should wish him prosperity and long life. Above all, he hoped very soon to be able to announce that His Royal Highness would condescend to accept that post which was held by his illustrious Parent, and become, under Her Majesty, the Vice-Patron of the Royal Geographical Society.

The meeting was then adjourned to Nov. 24th.

Second Meeting, Monday, November 24th, 1862.

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

PRESENTATIONS.—*General W. Marcus Coghlan; J. Lewis Franklin, and John Flint South, Esqrs., were presented upon their election.*

ELECTIONS.—*Colonel Thomas Addison, C.B.; Captain Bagot; Lieut.-Colonel G. Clement Baillie, R.E.; Captain C. E. Barrett-Lennard; General W. Marcus Coghlan, R.A.; Commander H. A. Fraser, I.N.; Captain C. Webley Hope, R.N.; Major-General Edward Macarthur, C.B.; Lieutenant Mervyn B. Medlicott, R.N.; Rev. John V. Povah; Captain Leveson E. H. Somerset, R.N.; Captain C. Freville Surtees; John B. Baillie; Lucas Barrett; J. Comber Browns; John Cargill; Walter Cope; Sedgwick S. Couper; J. H. Eaton; William Eaton; Henry D. Erskine; John Fletcher; James Griffin; Samuel H. Hinde; William Kershaw; Chessborough C. Macdonald; George F. M'Dougall, R.N.; Daniel Mackinly; Francis Muir; Frederick Rasch; John Shaw; John Thomas; P. G. Van der Byl; E. Wingfield Verner; Samuel Woods; and Heathcote Wyndham, Esqrs., were elected Fellows.*

ACCESSIONS.—Among the donations to the Library and Map-rooms since the former meeting were—Markham's 'Travels in Peru and India;' Brine's 'Taiping Rebellion in China;' Dhanjibhai Framji's 'Origin and Authenticity of the Arian Languages;' Barrett-Lennard's 'British Columbia;' Gether's 'Gedanken uber die Naturkraft;' Maps of the Victorian Mining Districts, Australia; Admiralty Charts, &c. &c.

EXHIBITIONS.—Several sketches of natives and zoological specimens, made by the East African Expedition; a sample of Abyssinian cotton, obtained by Dr. Beke, F.R.G.S.; and a specimen of lead from the Bight of Benin, sent by Captain R. F. Burton, F.R.G.S., were exhibited.

The Papers read were—

1. *Exploration of the Niassa Lake.* By DR. LIVINGSTONE and his Party.

AFTER establishing the members of the University Mission in the neighbourhood of Mount Zumbo, Dr. Livingstone proceeded with his party to explore the Lake Niassa. They carried a four-oared

boat in three weeks past Murchison's Cataracts, which extend through 35 miles of latitude, and launched her on the upper waters of the Shiré. They entered the lake on September 2, accompanied by a score of natives, and explored its western coast for 200 miles, travelling until they were compelled to return from want of food, due to the recent extermination of the northern coast tribes by savage warfare. Part of the expedition went on foot and part in the boat: the latter were never able to cross the lake or venture far from shore, owing to the suddenness and extraordinary violence of the storms. They ascertained its breadth by rough triangulation, whenever the haziness of the air allowed the opposite shore to be seen, but no certain knowledge was obtained in regard to its northern extremity. The lake has something of the boot-shape of Italy: it is narrowest at the ankle, where it is 20 miles, and broadens gradually to 50 or 60 miles. Its western shore presents a succession of sandy bays, each divided from its neighbour by a bold headland, with detached rocks, extending some distance out to sea. Much of the land adjacent to the lake is low and occasionally marshy: it is tenanted by water-fowl and some elephants. Eight or ten miles from the shore are ranges of high and well-wooded granite hills, nearly parallel to its course, and presenting in several places a magnificent succession of distances. The intervening plain narrows towards the north; where Dr. Livingstone turned, it disappears altogether. The depth of the lake is readily to be traced by the changing colour of its surface. A belt of bright green water fringes the shore, and varies in breadth from a few yards to several miles: beyond this is the deep blue water of the body of the lake. A sounding-line of 200 fathoms was found insufficient to reach the bottom one mile from shore. The temperature of the water is 72° Fahrenheit; its rise in the rainy season is 3 feet. Five affluents were seen on its western coast, of inconsiderable size: their united volume was far inferior to that of the waters of the Shiré.

Natives, of essentially one tribe and language, throng the southern portion of the lake. Their villages are so close together as frequently to form a continuous line of habitations. They are hard-working fishermen and good cultivators of the land: they were reasonably civil to Dr. Livingstone's party, and exacted no dues for the right of transit. The slave-trade is unfortunately active. An Arab had built a "dhow" (boat) on the lake, in the latitude of Ibo, for the purpose of ferrying slaves across. Dr. Livingstone's present endeavour is to transport a steamer to the Niassa for the purpose of checking this traffic as far as may be practicable, and also with the object of further exploration.

THE PRESIDENT said the object of Livingstone, now that he had accomplished this remarkable journey in a small boat, after carrying it up the Shiré alongside the cataracts which had been alluded to, was to convey a small steamer, which the Government had placed at his disposal, by the same route from the Zambesi to the lake, in the hope that it would enable him to put an effectual stoppage to the slave-trade proceeding across these waters from the westward. Hordes of slaves are brought down from the interior, and carried across the lake at certain passages where the lake is narrowest. The most cruel part of the traffic is that when the lakes are passed; the slave-gangs are driven down to the coast, and lodged in the malarious recesses and bights at the mouths of the rivers, until the slave-ships are ready to take them away. In this way hundreds of them perish, as shown by the skeletons which have been found there. With a single small steamer, still better with two, Livingstone contends he could do more to check the slave-trade than by a number of large vessels stationed off the coast; since it is impossible for these to hunt out every little bay into which the slaves are driven. In this way, therefore, at much less eventual expense, Livingstone may be able to carry out this great object which he has at heart.

2. *Letters from CAPTAINS SPEKE and GRANT, of the East African Expedition.*

THESE are dated at various times between February and September, 1861, during which interval the travellers encountered great difficulties, due to two independent causes. The country had been afflicted with drought and famine to an extent which made all traffic exceedingly difficult, and there were native wars on the occasion of a disputed succession to a chieftainship. As a partial consequence of these, the porters who accompanied Captains Speke and Grant were constantly abandoning their service, either fearing the danger or taking advantage of the general lawlessness of the land. The geographical additions to our knowledge are thus far of little importance. The movements of the travellers have been seriously embarrassed; Captain Speke has also suffered, and recovered from, an attack of weakening fever. The latest intelligence was the most favourable: the party were then encamped in s. lat. $3^{\circ} 26'$, interpreters had been procured, a sufficiency of porters had been obtained, and Speke and Grant were on the point of advancing towards the Nianza Lake. Robberies and desertions had materially reduced their funds; but Captain Speke's last letter, of September 30, 1861, was written in better spirits. He regrets that, as circumstances have turned out, he did not attempt the northern route to the Nianza by way of Kilimanjaro, instead of following his previous track.

3. *Proceedings of MR. CONSUL PETHERICK, F.R.G.S., on the White Nile.*

MR. PETHERICK's departure from Khartum was delayed so long, that the periodical winds of the White Nile had changed to his

disadvantage, and he was wind-bound to the north of the Bahr el Ghazal. Owing to the representations of the British Acting Consul-General at Alexandria, His Highness the Viceroy of Egypt had sent instructions to the Governor of the Sudan to forward such assistance as might be necessary to Mr. Petherick.

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4. *Letters from* SAMUEL W. BAKER, ESQ., F.R.G.S., *on his Travels by the Atbara River and its Tributaries, in Nubia, dated September 10th, 1862.*

THE author spent some months shooting in the neighbourhood of the tributaries of the Atbara River, the single confluent of the Nile, and visited a large amount of country that had previously been undescribed. The chief tributaries of the Atbara are the Settite, Salaam, and Angarep; he considers the former to be the parent of the river. These streams, which are copious near their sources in the high lands of Abyssinia and pour increased volumes of water during the rains, are barely capable of reaching the Nile in the dry season. They are absorbed in sands and lost in fissures. Even the Atbara itself dwindles down to an insignificant stream before entering the Nile. They traverse a land that has great natural fertility, and is cultivated for cotton. A curious colony of natives of Darfur, called Tokrowris, cultivate cotton extensively: they are pilgrims who have settled by the way, on their return from Mecca. The author desires to draw attention to these large and fertile districts as a possible source of an abundant supply of cotton. Mr. Baker had excellent sport in shooting elephants and other game. He dates his letter from Khartum, whence he proposed proceeding up the White Nile for the purposes of exploration. He speaks strongly of the wretched state of lawlessness into which the White Nile races have been driven by the unscrupulous conduct of the native servants of traders on that river.

THE PRESIDENT said there were several other communications which there would be no time to read. They had received a few words from Captain Burton, who had ascended a mountain, which he calls the Elephant Mountain, in the Bight of Benin; then they had a communication from Mr. Moffat, brother of the late lamented Mrs. Livingstone, suggesting the employment of camels for explorations in Southern Africa; and they had received the following communication from the Foreign Office:—

"I am directed by Earl Russell to transmit to you herewith, to be laid before the Committee of the Royal Geographical Society, an extract from a despatch from the British acting Consul-General at Alexandria, relative to the difficulties in which Mr. Consul Petherick and his party were placed in the White Nile, according to information received from Khartum, on the 11th of August last.

"I am to add that, on the pressing representations of Mr. Consul Sanders,

the Egyptian Government has sent orders to the Governor of the Soudan to take such steps as may be necessary to render assistance to Consul Petherick."

When His Highness the Viceroy of Egypt was elected an honorary Fellow of the Society, he mentioned to His Highness the great service he might render to the cause of geographical science by assisting explorers, adding, "But, Sir, our operations extend beyond your frontiers;" upon which His Highness said, "I pray you to consider that my frontiers are very elastic." So powerful a man as he was, it was gratifying to find that his Government had at once supported us in this manner.

Adverting to the expedition of Captains Speke and Grant, the President said he much regretted that so long a history of misfortune had been read to the Society. It was necessary to explain the difficulties that had occurred, and it only showed the uncertainty that attends travel in Africa. On the first exploration Speke and Burton in seven months traversed the whole of the region from Zanzibar to the lakes, both of which they discovered; and now, though equally zealous, Speke had found the greatest difficulties thrown in the way of his progress, owing to the wars which have broken out among the different tribes. The condition of any portion of the interior of Africa at one season is not to be calculated upon for the next season. We could only join in the hopeful wish expressed by Speke in his letter, and in the belief that his energy and that of his associate will enable them to overcome all obstacles.

Should they ever reach Lake Victoria Nyanza, and get to the northern end of it, then the prospects would be most cheering; because not only has Consul Petherick gone up the river towards Gondokoro, but there are three adventurous ladies, who, having freighted a steamer at their own expense, are now proceeding beyond Khartum, up the Nile. From having that steamer at their disposal they are likely to shoot past Consul Petherick; and it is therefore not improbable that the first assistance which will be brought to Speke, if he arrives at that point of his destination, will be brought to him by ladies. It is quite an original adventure; he knew nothing like it in the history of modern travel.

Besides these two expeditions there was a third, which that intrepid explorer, Mr. Baker, was carrying out. Seldom had a paper been read which exhibited a greater amount of gallant and bold exploration on the part of a sportsman. Mr. Baker really went there in the first instance in search of wild animals, but it would be seen what an extensive addition he has made to our geographical knowledge of a large portion of Africa. He has done this entirely at his own expense, with no assistance from the Government; and if in future times the Society should desire to seek a man to carry out explorations in distant regions, Mr. Baker is one of the best men they could select for such a purpose.

As Colonel Rigby was present, the President took the opportunity of acknowledging how much geographers are indebted to him as Consul at Zanzibar, for the assistance he has rendered on all occasions to our African travellers.

COLONEL RIGBY said, as he was resident at Zanzibar for a year after the departure of Captain Speke, he could explain the causes of some of the unforeseen difficulties which the expeditionary party had met with. In the first place, shortly after Captain Speke left the coast, a famine of unusual severity occurred all over East Africa: so much so that the poor famished wretches came from the interior in search of food to Zanzibar; while towards the eastern shores of Lake Nyassa, ten able-bodied slaves were given in exchange for one bullock. The effect of this famine was to prevent supplies reaching Captain Speke from Zanzibar. Supplies of various sorts had been sent out, but neither these nor any letters had ever reached him from the time he had advanced a few days into the interior; the caravans not being able to

come down in consequence of the famine. Another cause was the serious rebellion which broke out at Zanzibar. A chief tribe there, who are all slave-dealers, rose in rebellion against the Sultan; and when that rebellion was put down with British assistance, most of the people engaged in it went over to the mainland, and they have spread themselves over the interior, making slaves of the natives, and selling them. He had received a letter from Captain Speke, written on the 28th of April, explaining the state of that country in consequence of these marauding Arabs from Zanzibar. He had also a letter from Colonel Pelly, dated in July last, stating that he had heard from Speke, who was at Kagwé on the 30th of September, 1861, and that he was sending up at his request a caravan of fifty men and goods. If Captain Speke had to await the arrival of those men at Kagwé, it would of course be a considerable time before he could advance to the north, to Lake Nyanza. It was a lucky circumstance that Mr. Petherick had also been delayed, otherwise he would have arrived south much sooner than Captain Speke's expedition could possibly do. A great many Arabs and Africans at Zanzibar have travelled over that country, and they all agreed that a very large river flowed into Lake Nyanza from the west, which they called, after the name of the country, Ougonda. They state that the Sultan of Ougonda is a very powerful chief, having a large army, and about 2000 war-boats on the lake. It is not known that any great river issues from the lake, either on the north, east, or south; but, from native accounts, he thought it probable that the River Juba comes out of the lake on the east coast. The Juba is entirely unexplored. The Baron Van der Decken, a Hanoverian, who is now in Eastern Africa, has written to Germany to purchase a steamer, and has applied to the Prussian Government for a company of sailors and marines, for the purpose of exploring the Juba. He has already reached the mountains of Kilimanjaro without any hostility on the part of the natives, and he is waiting at Zanzibar till this steamer arrives.

It must appear strange why the slaves who come down to the coast should be all brought from the west of Lake Nyassa. The reason is that the whole tract of country lying between the coast and the east side of the lake is almost entirely depopulated, from the effects of the slave-trade. The Arabs have recently built a vessel on the lake for the purpose of conveying them across. They are brought down to Quiloa, the great slave-port on the east coast, by the M'bisá tribes. They generally drive down young children when they can procure a sufficient number of them, after having put the men and women to death. They bring down 2000 and 3000 children in one caravan, and dispose of them chiefly at Quiloa. If the trade is not put a stop to, in a few years the whole of the rich country whence the slaves are brought, and which Dr. Livingstone has visited and described as producing such beautiful cotton, will become desert. Dr. Röscher was unfortunately killed by some robbers at nearly four days' journey from the east coast of Nyassa: the surviving servant returned to Zanzibar. The murderers were seized by the chief of that country and sent in chains to Zanzibar, where they were put to death.

In reply to Mr. Craufurd, it was stated by Colonel Rigby that of the slave-children brought down to Quiloa, about 15,000 had been taken north to the Persian Gulf and ports on the east coast of Africa, and 10,000 kept in Zanzibar; and, in reply to Colonel Sykes, that it would take four months at least before the convoy of supplies sent from Zanzibar could reach Captain Speke at Kagwé.

COLONEL SYKES, M.P., observed that Captain Speke and Captain Grant were placed in a position of very great difficulty, in which their moral courage and physical endurance had been tried to the utmost. From two letters he had received from Captain Grant he learnt that with all their energy they have been brought to a standstill, and the object they had in view absolutely stopped. Captain Grant was separated for some months from Captain Speke,

and surrounded with difficulties. Under these circumstances the Society would make allowance for the impediments they had met with, for it would be found that nothing has been wanting on the part of these two resolute explorers. He still hoped that they might be enabled to make their way; but from the state of anarchy in which the country now is, the difficulties they have to encounter are no doubt very extensive and lamentable, and it may so occur that they will have to retrace their steps and return to Zanzibar.

Captain Speke in a part of his letter expressed regret that he did not take a different route, and instead of following their former route up to Nianza (and they have not got so far as Captain Speke did on the former occasion, for they have only got to Kagwé,) that they had landed at Mombas, and so cut into the northern head of the lake by the flank of Kilimanjaro. That would have shortened the distance one-half, supposing they could have passed the Kilimanjaro range. Beyond the mountain-range of Kilimanjaro no doubt the route is practicable, and if they had taken that route they might have avoided the difficulties which now beset them. It is a question also whether the Nianza could not be reached by the river Dana. Officers in the survey branch of the Indian navy having ascended the river for a considerable distance.

The PRESIDENT repeated what he had said, that it was impossible for Captain Speke and Captain Grant to advance at present as successfully as before, owing to the changed condition of the country and warlike relations of the inhabitants. If the present route had been found difficult, it was the route of Captain Speke's own choice. He had a high admiration of these gentlemen, and fully concurred in all that Colonel Sykes had said of them. With regard to those adventurous ladies who have gone up in a steamer from Khartum, he hoped Mr. Tinné would be kind enough to tell the meeting what he knew about them.

Mr. TINNÉ said he had very little information to give with regard to what had taken place, and he feared that what he had to say would be of very little interest to geographers. These ladies are not scientific—they have only the virtue of a great love for travel. It is not the first exploit that they have been engaged in, but he believed it is the greatest that they have ever undertaken. Having arrived at Khartum, they did not find the place so agreeable for residence as they expected. It was their intention to have resided there during the four winter months, and to have made explorations from Khartum as their head-quarters, in different directions, including Abyssinia and Upper Nubia. Circumstances, however, obliged them to change their plans, and they proceeded up the White Nile in search of a site for a habitation; but, not meeting with any to their satisfaction, they were driven at last to the plan of hiring a steamer. Fortunately the Viceroy's brother, Prince Halim, who was once Governor of the Sudán, had a steamer there for his own use, and he left her there when he returned to Cairo, in charge of a French gentleman, who was his agent. The ladies were enabled to make a contract with this gentleman for the hire of the steamer. While one of the party returned to Khartum to negotiate and complete the contract for the steamer, the other two were left at Mount Hemaya, where they were still encamped at the date of the last advices in July, just as the steamer had arrived. He believed they intended to proceed immediately further up the river and to go to Gondokoro. If he received any further accounts, he would be happy to communicate the information to the Society.

What surprised him was, as there were accounts of Consul Petherick and of Mr. Baker up to August, that neither of these gentlemen in any of their accounts should have mentioned such a singular circumstance as a steamer at the disposal of any parties at Khartum, or that there was a party of ladies in their immediate locality.

His correspondents described the scenery of the White Nile as extremely beautiful, resembling in many respects Virginia Water, being finely wooded down to the water's edge, with many islands, distant mountains and highlands, water-lilies in the river, and all sorts of attractions for the traveller. He had not heard from these ladies anything of the dangers that had been mentioned in other accounts. In every letter he received they say, "We are perfectly safe; we place implicit reliance in the Government, and the only drawback is the continuance of the horrid slave-trade." The slave-trade was going on there, in spite of all that the Viceroy can do or the laws can say against it, from the causes that had been mentioned. He could only hope that public opinion would be brought to bear upon the Egyptian Government, and thus help to put a stop to this traffic.

The President adjourned the sitting to the 8th of December.

Third Meeting, Monday, December 8th, 1862.

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

PRESENTATION.—*Walter Cope, Esq., was presented upon his Election.*

ELECTIONS.—*Captain Robert B. Baker; Captain Sir John Swinburne, BART., B.N.; Rev. Julian Edmund Woods; John Bramley-Moore, M.P.; Robert Holland; Horatio N. Lay; Edward Burnet Tylor; and M. W. Mills Whitehous, Esqrs., were elected Fellows.*

ACCESSIONS.—Among the donations to the Library and Map-rooms since received were—Baldwin's 'African Hunting,' Du Chaillu's 'Voyages et Aventures dans l'Afrique Equatoriale,' Wallich's 'North Atlantic Sea-Bed,' Report of the U.S. Colorado Exploring Expedition; Maps of the 'Novara's' Voyage round the World; Maps of the entrance to Chicago; Map of Japan, showing the route of Sir R. Alcock, from Nagasaki to Jeddo; Russian Map, from Pekin to Kiakhta; Johnston's Map of Australia, Eastern sheet; Stanford's Library Map of Asia, &c. &c.

EXHIBITIONS.—Several geological specimens from the Gold-diggings to the East of Kiakhta, as well as a Mongol rifle, obtained by Mr. Grant, and Relief Model of the island of St. Paul's, taken by the Austrian frigate 'Novara,' and presented by the Archduke Ferdinand Max, of Austria, were exhibited

The Papers read were—

1. *Narrative of a Journey from Tientsin to Mukden, in Manchuria.* By A. MICHIE, Esq.

THE author followed the coast and reached the Great Wall of China in six days from Tientsin. Here the mountains of the interior approach the shore; and the road to Manchuria, following the narrow plain between them, issues through the Wall at a well-guarded

gate, by the military station of Shan-hai-kwan. At this place the author was brought for the first time in contact with the Mandarins, who gave him willing assistance after his passport had been examined, though they were at first disconcerted at his arrival, and in doubt how to receive him. The road on entering Manchuria continues to follow the coast, and is barren and devoid of interest. After a distance of two days' journey, it reaches a vast mud-plain, barely elevated above the sea-level, and periodically flooded to a distance of 50 miles from the coast. Its surface is smooth, and caked, and whitened with efflorescence, and nothing but sea-birds live upon it. It resembles the low land at the mouth of the Peiho, on a largely extended scale. The author concludes from the existence of these flats, and also from the occurrence of numerous dry channels, that the whole of the Gulf of Pechili and the adjacent coast has been elevated within a very recent period. The appearance of the country improves considerably in the neighbourhood of the Liauhö, where there is abundance of cultivation. The author visited Ying-tse, the newly-established port at the mouth of that river, and found a few foreign residents engaged in a limited trade. Here he left his baggage-waggon, and, transferring his effects to the back of a pony, travelled toward Mukden, which he reached in four days. The city appeared to him unlike anything he had seen in China, owing to the solidity of its architecture, the neatness and cleanliness of its streets, and the thriving appearance of its inhabitants. He compares it to Edinburgh, in the same sense that he compares Tientsin with Glasgow, and either Suchow, Hanohow, or Canton with London.

The inhabitants of Manchuria have an independent bearing that contrasts favourably with the enervated races of central China. They always travel armed, for robberies are said to be numerous, and the Government is weak. In appearance they seem to be Chinese rather than Manchus, for the natives have either been driven into the remote pasture-lands of Manchuria, or become absorbed by the Chinese immigrants. The few that are left are Chinese in language, manners, and customs, though there is little cordiality between the two races.

The material wealth of the country lies chiefly in its crops of pulse, but trade of all kinds is restricted by the cost of transport. Its climate is pre-eminently dry: it is extremely hot in summer and cold in winter, and the air is always pure and bracing.

The author met with no obstruction from the authorities, and was only occasionally inconvenienced by the curiosity of the mobs.

2. *Route from Peking to St. Petersburg, via Mongolia.* By CHARLES MITCHELL GRANT, Esq.

AFTER some years' wandering, Mr. Grant found himself at Peking, whence he determined to attempt the overland route to Russia. He obtained Chinese credentials and a Russian *visé*, and started in a mule-litter, accompanied by two baggage-carts. He had few difficulties and little adventure before reaching the Great Wall. He passed caravans carrying tea to Russia, and met cases of rifles in large numbers coming from Russia, as part payment for the cession of the Amur; and droves of ponies from Mongolia. Coal-pits were at work in the neighbourhood of Suen-hoa-foo, the head-quarters of the French Lazarist Mission in the north of China. His preparations for crossing the Desert of Gobi were made at Chang-kia-kow (called Kalgan by the Russians), which is an exceedingly important town, as all the Russian traffic passes through its gates. He says there is full employment for a sportsman in its neighbourhood in the pursuit of an abundance of wild ducks, antelopes and leopards. Here Mr. Grant dismissed his Chinese servants, who feared the cold of the Gobi Desert, and engaged two Mongols, with five camels and a cart, to take him to Kiakhta for 33l. He had also to procure a store of provisions for his own use, during the six weeks' journey before him. His party combined with four others, forming on the whole a caravan of 100 camels, under the leadership of a man whom they selected as their chief. The routine of travelling was as follows:—In the morning, two men on fast camels collected the herd, which were arranged in five files, for the purpose of being packed, a process that was completed in half an hour. They then started in one long row, each animal being tied by a cord six feet long, that led from its nose-ring to the gear on the back of the one that preceded it. Mr. Grant's cart was drawn by a single camel, and was of the rudest workmanship, without a particle of iron in its composition: its place was in the middle of the caravan, where he was attended by his two Mongols. In the afternoon some encamping station was reached; that is to say, a well of water without any neighbouring village. The camels were then again arranged in files, quickly unladen, and turned loose to graze, with their nose-cords fastened round their necks. A two-poled tent of 18 ft. by 12 ft. was next pitched; a bright hot fire of dry camel's dung was made in a grate in its centre, and a cauldron of water or snow boiled with pounded brick-tea. Each man carried a wooden bowl in his breast, which he used as a tea-cup. Then followed boiled meat and millet, also eaten from the bowls. The

chief of the caravan was the only Mongol who drank spirits, the others had simply water. Later in the evening the camels were collected and secured for the night; more tea was made, and pipes were smoked. The Llamas of the party chanted prayers every night, passing the prayer-book from hand to hand, that each might use it in his turn. Lastly the whole party huddled close to the fire and slept undressed, with their sheepskin-coats for a covering and their boots for a pillow. The cold at night was intense and variable: on April 6th, Mr. Grant registered 10° Fahr. below zero at 6 A.M., and usually on other days between $+10^{\circ}$ and $+18^{\circ}$ Fahr. The violence of the wind was remarkable in the desert of Gobi and in the north of China. The sailors' superstitious belief that whistling brings on a gale, is shared by the Mongols. Ourga, the capital of Mongolia, is the first town on the further side of the desert. The communication onwards to Kiakhta, occupies 4 days. Mr. Grant was, in all, 45 days from Chung-kia-kow to Kiakhta, during the whole of which time he tasted little else besides the provisions he carried. He considers no danger need be apprehended along the route he followed; but he would never recommend his countrymen to attempt it, as he did, alone. Mr. Grant's further journey to the Ural Mountains homewards is described in his Paper. He states that in his many travels he had never met with so much genuine hospitality and kindness as among the Russians. He discusses the proposed telegraph through Siberia, and looks forward to the time, at no distant date, when Pekin shall be connected telegraphically with London.

After the reading of the Papers on China, the PRESIDENT said he could not pretend to follow Mr. Grant in his varied excursion over so large a portion of the globe; but when he came towards the conclusion of it he felt himself somewhat at home, for he had also traversed the Ural mountains and descended the Tchussovaya River. He had also himself borne testimony, long before the Crimean war, to the hearty hospitality and kindness with which Englishmen are ever received by the Russians throughout those regions; and he was delighted to find that, after the close of a war which everybody now regretted, the same spirit of hospitality had been exercised towards Mr. Grant. To turn to the subject more immediately under consideration, we now learned from Mr. Grant that this so-called desert of Gobi is, in fact, a pastoral country. It is, to a great extent, clothed with grass; supporting numerous flocks and herds. It is not the ordinary route taken by the Russian caravans to and from China, of which they had just heard. It is a new route, which this adventurous traveller, depending entirely upon his own energy and his own means, has successfully traversed for the first time. He was glad to see present so many gentlemen connected with China, and he hoped they would favour the meeting with some information on the subject.

SIR HARRY PARKES said he thought the papers were exceedingly satisfactory in one respect, for they certainly established the efficiency and advantages resulting from the new treaty successfully concluded by Lord Elgin, one clause

of which gave to Englishmen and foreigners the right to travel through the length and breadth of that vast empire. It was also satisfactory to find that the passport which Mr. Grant obtained under the provisions of the recent treaty was sufficient to procure protection to that gentleman, that wherever he went the people received him kindly, and, on the whole, assisted him on his journey; and that in the outer dependencies of China, no less than in China itself, the people are not antagonistic to us as a race, and place no serious obstacles in the way of foreigners travelling through their territory. The countries described in the two papers which had been read are very interesting. In the first place, Manchuria is the cradle of Manchus (commonly known to us under the misnomer of Tartars) who conquered China upwards of two centuries ago, and continue to be the dominant race in that country. It is curious that that very country of Manchuria should have since become, in fact, almost a Chinese province; for the Chinese who now form the greater part of the population appear to have engrossed the province, and by peaceable means have almost reconquered the Tartars, who had previously conquered them. It was natural that in agriculture and commerce the Manchus would have to give way before the more industrious Chinese, whose profession is that of arms. He was afraid, however, that even in their own country, the cradle of the race, they exhibited the same martial degeneracy that is to be observed in the Manchu garrisons stationed in the different provinces of the empire. Mr. Michie said he saw nothing whatever of that strong military government, which we had been accustomed to read of, in the province of Shing-king, and that between Tientsin and Mukden he saw scarcely a hundred soldiers. Other travellers during the present year had crossed the same country, and they confirmed Mr. Michie's statement on that point. They spoke of the productive character of the country, and they also spoke of the numerous bands of robbers, who were mounted, and who seemed to career across the province, doing pretty much as they liked. He believed for a long period of time the Manchus tried to check as much as possible the immigration of Chinese into Manchuria; but lately, since the accession of the Emperor Taoukwang, the restrictions formerly imposed had been removed, and the Chinese have now penetrated very nearly up to the Amur river, which we know is the present boundary of Manchuria. Not long ago, Manchuria was nearly twice the size it is now; but by the treaties of 1858 and 1860 between the Chinese and Russians, the greater part of the two provinces Kirin and Tsi-tsi-har have been ceded to Russia. In fact, they have, apparently without knowing what they did or the extent of the concession, given the whole of the sea-coast which they at one time possessed to Russia, and have excluded themselves entirely from the ocean. He dared say many would not regret the change, considering how little the Manchus have done to develop that vast tract, and how much in the cause of civilization and progress the Russians were likely to accomplish. Mukden has been built on the plan of Peking. In fact, it is Peking *in petto*. It looked very much as if they wanted Peking No. 2 to be at hand, in case of their losing Peking No. 1. Lately, however, Mukden has not been so well garrisoned and kept up as formerly; and we know that when we approached Peking ourselves, in 1860, many of the Chinese Ministers protested against the Emperor going into Tartary, on this ground among others—that he would find all the population of the country beyond the Wall in a most disturbed and unruly state.

Looking at the two accounts given by Mr. Grant and Mr. Michie, he thought that the Manchus would compare favourably with the rival race, the Mongols. If we went back into the realms of history, we should find that they have fought against each other repeatedly. The Chinese have called in first the one, and then the other, and have pitted them one against each other on various occasions. The Mongols, however, with all their communication,

with China, remain essentially a nomadic people, while the Manchus have acquired agricultural tastes and habits, are much more stationary than the Mongols, and have certainly done far more in the cause of literature and refinement. In their attempt to conquer China, the Mongols had to withdraw to their deserts after a period of eighty years; whereas the Manchus have kept possession for three times that period. But in Mongolia we observe the same great fact of the irrepressible Chinese settling down in this region which we were accustomed to look upon as a desert, and winning it from its nomade owners just as we see they have done on the other side in Manchuria. It appeared from Mr. Grant that Mongolia is not a waste tract, as has frequently been supposed. The first region entered beyond the Great Wall—inner Mongolia—is a very productive tract. Then we come to a plateau generally called Gobi, or desert, though the word Gobi appears to be applied to any tract that is not cultivated; at least, we do not find vast tracts of sand, and where there is no cultivation, it appeared to be hard pebbly plain. The plateau appears to be crossed, and a descent already commenced towards the Russian frontier, when we reach Ourga, the capital of Mongolia. Beyond that point we re-enter a better country, which is under cultivation, and yields cereals and grain; so that in crossing Mongolia we may divide the journey into three stages: the feeding-lands of inner Mongolia; then the central part, which we may continue to call by the name of Gobi, or desert; and then the third stage from Ourga to Kiakhta on the Russian frontier.

Mr. Grant had not only given us valuable information on the subject of that country, but he had also started a very practical question in which all England and, in fact, all Europe, had a very vital interest. It is the question of the speediest mode of communication with China, which he certainly thought, with Mr. Grant, might be conducted with much greater rapidity by the way of Russia than by our present route. The time occupied in communicating with Peking by the usual overland route is at present not less than 55 days, and Mr. Grant says that, by means of couriers and telegraphs, this time might be very much reduced. We know practically that the Siberian route is already the quickest mode of communication, for the news of the Treaty of Peking reached London *via* Russia a week before it came by the ordinary route, and we thus got the news in some 37 days. If it be the case that, with the existing rude means of travelling across Mongolia, information could reach us earlier by that than by the present steam-route, although the latter is aided by the telegraph from Alexandria, of course it stands to reason that, with improved appliances, the superiority of the Russian route might become much more marked, and communication might be greatly accelerated. We know that the Russians, as fast as they can accomplish it, are carrying a line of telegraph across their own dominions, with the view of reaching the Pacific, so as to communicate with their possessions in America, and that a part of their project, which they intend to effect within the next twelve or eighteen months, is to carry a branch line from Irkutsk to Kiakhta. A line of telegraph from Kiakhta to Peking, or to the Taku ports, would then suffice to complete telegraphic communication between Europe and China. The difficulty lies between Kiakhta and Peking. On his arrival in this country he heard that this enterprise had been thought of and discussed, and that some progress had been made in carrying it out by Mr. Reuter. That gentleman had put some questions to him as to the district between Kiakhta and Peking; and he only regretted that he had not possessed Mr. Grant's information, that he might have enlightened Mr. Reuter more than he was able to do. That gentleman had now an agent at Peking; and if the Chinese Government could be induced to second the plan, we might hope that this means of communication might be carried out. But until the question is fairly put to the Chinese Government, it is impossible to say whether they will be able to give the desired effect to the proposition.

Our present information is imperfect both as to the extent of their authority over the tribes inhabiting outer Mongolia, and over those of inner Mongolia. Between Manchus and Mongols a natural feeling of jealousy exists; and this, combined perhaps with past experience of their own, may have influenced the Chinese Government in declining the assistance of a Mongol force which the Mongol Prince Sangkolinsin lately volunteered to march into China, first against the rebels, and subsequently against the Allies. Still he believed the Chinese rule over the Mongols had always been a lenient one, and that, on the whole, the Mongols feel attached to the present Chinese Government. Their plan is to have all the chiefs of the different Mongol tribes in their pay; they give them large sums of money, rank, and various other privileges, in return for a very nominal tribute. The people had the character of being exceedingly obedient to their chiefs, and of readily submitting to whatever their chiefs required of them. Therefore, it is possible that there might be a sufficient rule in that vast tract of country to secure the protection of a line of telegraph from injury.

Mr. LAY said that there is certainly no country more entitled to the interest of the British public than China at the present moment. We have a very large trade with that country, out of which we make large profits. The trade at the port of Shanghai alone amounted to 29,000,000*l.* sterling in the year 1861; and the trade on the River Yang-tse-kiang in the first year after it was opened amounted to 4,000,000*l.* sterling. At the present moment, especially, the British people should show an interest in China, inasmuch as it is her hour of difficulty. By reason of her weakness and owing to the rebellion which exists in the country, China has shown a disposition to give access to foreigners; and it is our duty now to avail ourselves of that opportunity to introduce such reforms and improvements as will be beneficial alike to them and to ourselves. They had heard probably of the expedition which is being organised in this country to lend assistance to the Chinese Government. The object of that expedition is not only to strengthen the Government, but to be instrumental in introducing those reforms which will be our only security for peaceful relations with China. Prince Kung has shown a disposition, although struggling with great difficulties and with a strong party opposed to him, to avail himself of the services of Englishmen; and has given a promise that he will, in return for the advantages which he expects to gain from our assistance, adopt those reforms in his administration and introduce those improvements which will be our best guarantee, and gain us that access into China which has been hitherto denied to us. The country has suffered during the last few years partly from misgovernment at Peking, and partly from the vastly increasing population, which the productive power of the soil is insufficient to maintain. There has been no outlet for that population. They have gone on increasing, and they must be fed; and, inasmuch as there is no rice to feed them, they rebel. He therefore thought that one measure to which attention ought to be drawn is, the organization of some scheme of emigration from China, so as to relieve the country of its surplus population, and colonise Borneo and other islands in the Indian Archipelago, where there are thousands of acres lying waste for want of cultivation.

A few words with respect to the Tao-pings. They are one of the parties giving the Government trouble at this time. He happened to be well acquainted with the men who formed the nucleus of the movement. Some of them some years ago were members of a Christian Union in Hong-Kong, and circumstances brought him into connexion with them, and led him to form a very unfavourable opinion of them. As members of the Union they were maintained by the money subscribed in this country. They represented themselves as coming from different provinces; and, according to the distance at which those provinces were situated from Hong-Kong, a sum of money was allowed to each.

man, to carry him into his district and enable him to preach the Gospel and distribute tracts, each man receiving in addition a supply of Old and New Testaments. It came to his knowledge that these men never left Hong-Kong, and that they sold the Testaments to the Chinese printer, who in his turn resold them to the Christian Union, the Chinese printer receiving from 500 to 1000 per cent. upon each Bible. This is a fact which, he thought, should be known to the British public, and which certainly produced an unfavourable impression upon his own mind. He asked one of them, on one occasion, how it came to pass that they could reconcile themselves to this species of imposture; and asked him more especially as to the advantage of their change of name, as he found they were all under false names. He was told: "Well, possibly you have a Supreme Being, but we do not know; we worship him now here, and we gain a living by it. If it should happen by-and-by that he really does exist, and he calls us to account for any shortcomings of ours in respect to our profession or otherwise, our answer will be: 'You are quite mistaken; our name is not so-and-so, and so you will find if you will refer to the records of the village in which we were born.'" He thought with reference to the opinions we might entertain of the Tae-pings, that there was but one safe guide. If a disturbance occurred in Ireland, for instance, we should not expect the judgment of America, or Germany, or France, but we should ask ourselves what we thought of the rising. With regard to the Tae-ping rebellion, the question should be, What do the Chinese people themselves think of it? They surely ought to know whether these Tae-pings are worthy of confidence or not. Now, everywhere they have pronounced against the rebels. In no one case, so far as he knew, had they received any support or assistance from the people; and this he thought an unanswerable argument against them. As he said before, we went to China hoping not only to strengthen the Chinese Government, so as to enable it to give the protection that we require for our trade, but also to be instrumental in introducing the telegraph, which he thought a great lever by which to open the country to commerce. The first thing that should be done was, if possible, to introduce the telegraph-wire, and to connect Pekin with the provinces, so as to keep the Court informed of what transpires in the provinces. He hoped that, before twelve months should have passed, that—not the least result of the expedition with which he himself was connected—would be the first instalment of information that would be valuable to the Geographical Society.

MR. CRAUFURD asked Mr. Lay to describe the nature of the system under which the revenue is collected for the European trade, and the amount of the revenue.

MR. LAY said the system under which the revenue is collected at the twelve ports is this: the Chinese Government have appointed him, as Commissioner of Customs, to select for them officers who are placed at the ports. The revenue at Shanghai is at the rate of 1,000,000*l.* sterling by the last accounts. They had not the statistics for the other ports for the last year. The system has been in operation at Shanghai for seven years, and it has only been recently extended to the other ports; but he expected to collect some 2,000,000*l.* sterling, or probably more, from all the ports taken together. The great thing to bear in mind in our relations with China is, to show that we wish them to make a profit as well as ourselves; for it is only in that way that we shall make them willing to introduce those improvements which are so desirable.

MR. CRAUFURD asked what might have been the revenue before.

MR. LAY said that Shanghai last year collected a revenue of 800,000 taels; and, when he took the customs seven years ago, it was only one-third of that amount. He believed the revenue at the other ports would be in proportion.

CAPTAIN SHERARD OSBORN, R.N., said the Papers applied to a part of the world and to an element that he was personally little acquainted with. As a sailor he

ought to know more about the waters and rivers of China than of the land. What he had read of Chin-king and Manchuria confirmed fully the observations they had heard from Mr. Michie. He looked upon that portion of Manchuria to which attention had been directed and of which they could best form an idea, by taking the area of Germany, with a population equal to that of London spread loosely over it, as destined to become a country of great importance in Eastern Asia. It is a great pulse and seed bearing district, and even when he was there at the first opening up of the Lake Petchili, he found the junks carrying down immense quantities of oil-cake to Shanghai and Swatow, so that by the aid of the oil-cake of that northern province was grown the sugar of the Southern States, and that fact was a remarkable proof of the circulation of trade going on in China. He did not think Newchang had answered the opinion we had formed of it, but he believed it would do so by and by. He believed that Manchuria was the Scinde of Eastern Asia, and that Newchang, like Kurra-chee, might take time but would eventually become a most important place of trade. With respect to the forthcoming expedition, with the command of which he had been entrusted, he could assure the Society that he should ever bear in mind that he was a member of this Society, and he was sure that all who accompanied him would do all they could to contribute to the geographical knowledge of this vast empire. In the next place he could assure them that they would not forget that they were both Christians and English officers. Those who fancied they were going out simply to slaughter the wretched Tae-pings were grossly mistaken. He was actuated by nobler motives, and he hoped to see carried out, as had been suggested by Mr. Lay, the development of an organised system of emigration from China, as a safety-valve for its present troubles and miseries. It would be, he should consider it, the greatest feat of his life if, upon taking any one Tae-ping town, he should be able to say that not a single soul had been unnecessarily slaughtered. He felt convinced that if this country would give its aid in providing an outlet for the vagabondage, banditti, and bad characters of China, to another sphere of action, these vagabonds would become good Chinamen and useful subjects in some parts of the Eastern Archipelago, and that it would be found one of the most effective means of suppressing the state of rebellion now existing in that country.

The PRESIDENT said there were yet many gentlemen present capable of offering observations upon the subject, but as the evening was too far advanced to call upon more than one speaker, he would therefore ask his honourable friend, the Chancellor of the Exchequer, to state the impression which had been produced upon his mind by what had passed on the subject.

The RIGHT HON. WILLIAM GLADSTONE, M.P., said he had been, he was afraid, one of the most ignorant, but certainly not one of the least attentive or the least interested of the listeners. In the official situation which he at present had the honour to hold, he had very good reasons—some of them not of the most agreeable description, others more agreeable—to have the name of China deeply engraven upon his mind. In the course of the last two-and-twenty years the history of our relations with that country had been a very chequered history, and even those who took the most favourable view of the circumstances of that period must feel, he thought, that it presented much which we were compelled to regret—at any rate to regret some even of the measures into which we may think that we have been driven; but he trusted we had reached the dawn of a happier day. In some points, and in one in particular which he could not help relating, it had been his lot long ago to learn a lesson of wisdom from the Chinese. It was during the period of controversy on the Corn Laws. At that time, in the course of a regular official correspondence, there happened to come before him a document relating to the dues payable on the tonnage of vessels entering one of the Chinese ports. The vessel in question was laden with rice,

and the language of the letter was singular. It was couched in the tumid style which was usual, so far as we could judge through translations, and especially at that period, with official persons in China. It spoke with the utmost contempt of external commerce in general, saying it was a matter of perfect indifference to the people of the Celestial or flowery land—if that be the true rendering of the Chinese phrase—whether the outer barbarians chose to come there with their cargoes or not. That was the general rule which the Chinese functionary, whoever he may have been, laid down; but he said, “There is one marked exception to be made to the insignificance of foreign commerce in general, that is, in the case where a foreign ship enters our ports laden with food for the people.” He therefore proceeded to lay down that that ship was to be admitted without the payment of any dues or charges whatever. He remembered the writer then wound up his letter with the words, “Your stupid younger brother sends his compliments.” But it was really a matter worthy of remark that at the very moment when we were ourselves so blind to economical truths and to the practical advantage of the country as to think our wisest policy was to use restrictive measures especially against the admission of food from abroad—we, the first of the commercial nations of the world—at that very moment the poor Chinese were teaching us a lesson which at a later period we had learnt and had applied with advantage to the country, how happily all men knew. The President had asked him to testify to any impression made upon his mind by the discussion that had taken place. He confessed he had always had a very deep impression with respect to what one might call the ideal character of the traveller. It appeared to him that no ordinary qualities are required to make a man a good traveller. To travel with profit, even in neighbouring countries, is no easy matter; but when we come to circumstances such as those of Mr. Grant in a remote country, with physical difficulties and social difficulties to contend with, there is required a combination of qualities, a readiness of self-command, a patience, a resolution, an ingenuity, a sagacity—all forming an aggregate of demand upon the mind and body, upon the human faculties in general, which it is by no means easy to meet. He frankly owned he considered it one of the chief prerogatives of the inhabitants of this island that it has furnished to the world so large a proportion of energetic and enterprising travellers. What he had heard to-night, especially in the case of Mr. Grant, convinced him that the breed is not extinct, and that, aided greatly by the beneficial agency of this Society, we are still likely to furnish a large supply of persons both qualified and willing to undertake the exploration of what yet remains unexplored of the surface of the globe. But there was one consideration higher still, for in vain would all that energy, and all that sagacity, and all that self-command be shown in opening up places still unknown to us, if, when we arrived there, we were to carry with us the curses and not the blessings of civilization. He was confident, and he entertained a sanguine hope from what he saw and heard upon every side, that a much higher standard of moral and social duty—of duty incumbent upon us both as Christians and as men—was now beginning to establish itself in the public mind, than what had at certain periods been observed and maintained. He trusted that the power and vigour that were being devoted to the work of travelling will only be the pioneers of a process which will be the means of conveying to foreign countries, so far as it was in our power, the very best of the blessings we ourselves enjoy, and he would say in conclusion, if that general persuasion of his had wanted any special confirmation, he should have derived that confirmation in the fullest manner from the few simple, manly, energetic, and expressive terms in which his gallant friend (if so he might be permitted to term him), Captain Sherard Osborn, had been pleased to announce to the meeting the spirit in which he was about to undertake that mission on which he was shortly to set forth. He was sure he expressed the universal sentiment even while he was speaking in his character of an indi-

vidual, but not, he believed, speaking sentiments alien to those of the statesmen with whom he had the honour to be associated, if he said to Captain Osborn that with all their hearts they bid him "God speed." They were sure the name and fame of our country were safe in his hands, and they trusted and believed that when it pleased God he should come back amongst us, he would come back with a great accession to his personal fame and celebrity, and also with the credit and honour of having added to the character of England in that distant quarter of the globe.

The President then adjourned the meeting to the 12th of January, 1863.

ADDITIONAL NOTICES.

(Printed by order of Council.)

1. *Progress Report of the Exploration Committee of the Royal Society of Victoria for 1861.*

THE Exploration Committee, in submitting their Annual Report, deem it sufficient to sketch merely in brief outline the main incidents which characterised the Victorian Expedition during the year. The glorious achievements, the severe sufferings, and the mournful losses, of the explorers caused universal admiration, anxiety, and grief, and have been recorded already so fully, and discussed so frequently in all their bearings, as to render their repetition now unnecessary.

It was stated in the report of the Committee for 1860 that the expedition had reached Menindie amply provided, and without any unusual difficulty.

The final departure of Mr. Robert O'Hara Burke (the leader), with the advance party from the Darling, took place on the 19th October, 1860. At Torowotto, on the 29th October, Mr. Wright, who accompanied him so far, left and returned to the Darling with the view of conducting the remainder of the expedition to Cooper Creek.

Mr. Wright reached Menindie on the 5th November, and on the 3rd December intelligence of his appointment as third officer and return to Menindie was received in Melbourne. The Committee considering the instructions originally given, ample to provide for any additional requirements which in distant parts of the country might be found needful, and believing that no letter through the ordinary channel could arrive at Menindie previous to Mr. Wright's departure, did not attempt to communicate with him regarding the expedition, at a distance of about 400 miles, as practically beyond their control.

On the particulars of Stuart's route reaching Melbourne, a despatch was forwarded conveying the intelligence to Burke. The disasters which befel the bearers of this despatch involved the necessity of affording them relief, and obliged Mr. Wright afterwards to reorganise his party. Mr. Wright finally left Menindie on the 27th January, and it is needless to recapitulate the difficulties which at a season so unfavourable were encountered by him in crossing the desert intervening between the Darling and Cooper Creek; those difficulties being much aggravated by scurvy, which prostrated several members of the party, and under which the scientific and enthusiastic Becker and his associates (Stone and Percell) succumbed.

Whilst Mr. Wright and his companions were suffering from difficulties of no ordinary character, Burke and Wills, accompanied by King and Gray,

penetrated with rapidity to the Gulf of Carpentaria, and performed, in crossing the continent from south to north, an exploit so brilliant as to have few parallels in the annals of geographical discovery.

On the 16th December they set out from Cooper Creek, leaving Mr. Brahe, with three others, in charge of the *dépôt*. After reaching the estuary of the Flinders River on the 4th February, they deemed it preferable to return on their own track, rather than avail themselves of the ready means of reaching the Burdekin settlements; induced to this decision possibly by a desire to relieve as early as practicable their companions at the *dépôt*.

The return could not, however, be effected within the time originally estimated by Burke, and, through a most remarkable and deplorable accident, the *dépôt* party quitted Cooper Creek on the very day (21st April, 1861) on which, exhausted from exertions and privations, Burke, Wills, and King returned; Gray having died on the journey, apparently from exhaustion, induced by scurvy.

Burke, Wills, and King, supposing that they in their weak state could not overtake the men who had just left the *dépôt*, determined to rest, and proceed towards South Australia. By a mortifying series of disasters the explorers failed to reach any of the settlements towards Mount Hopeless, although they approached to within less than 60 miles of some of the stations. The unfortunate travellers were moreover missed by Mr. Wright and Mr. Brahe, who, on the 8th May, visited Cooper Creek from the camp at Koorliatto, but failed to observe any marks above the *cache* there, and therefore believed that it had not been touched. Accordingly they at once went back to their camp, as in their opinion the precarious condition of some of the members of their party demanded a speedy return to the settled districts.

Burke and Wills, after displaying the most heroic fortitude, fell under the privations to which they were exposed, and died, the former on the 28th, and the latter about the 26th June.

Meanwhile the Committee, anxious to receive intelligence of the explorers, held a meeting on the 13th of June, and fitted out a light party, under the leadership of Mr. Alfred William Howitt, to obtain news of the expedition; and, if necessary, convey succour to it. On his way to Cooper Creek, Mr. Howitt met Mr. Brahe, near Swan Hill, and returned to Melbourne with him, in order to receive further instructions, rendered requisite by the information obtained from Mr. Brahe. Mr. Howitt's party, having been reinforced to meet the emergencies of the case, immediately proceeded to Cooper Creek, and was successful in relieving King, who after most praiseworthy attention and devotion to his dying companions, was supported by the natives with a kindness and solicitude which should never be forgotten in our future dealings with the aborigines. The journals of the explorers, preserved by King, were saved and rendered available.

The Committee, on the arrival of Mr. Brahe in Melbourne, represented to the Government the desirability that nothing which could tend to afford relief to the missing party should be left undone, and the sanction of the Government was accordingly obtained for a search, by Commander Norman, in H.M.C.S.S. *Victoria*, along the north coast. Arrangements were also effected by the Committee, under the supervision and with the aid of the Queensland Government, for organizing a land-party under Mr. Landsborough, with the view of co-operating with the expedition by sea.

Furthermore, under the apparent urgency of the case, the Committee were induced to engage the services of Mr. Walker and his aborigines to search for any traces of the explorers between Rockhampton and the Gulf of Carpentaria, in case they should have returned, as might have been expected, by that route.

The *Firefly*, conveying Mr. Landsborough and his party, was unfortunately wrecked at Sir Charles Hardy's Group, but with no further loss than two

horses, and, through the aid of Commander Norman and crew of H.M.C.S.S. *Victoria*, the party finally reached the gulf shores, and formed a dépôt on the Albert River.

Mr. Walker, on his way overland from Rockhampton, having struck Burke's tracks, on the Flinders River, came, in accordance with previous arrangement, to the rendezvous, and there obtained from Commander Norman the supplies necessary to enable him to follow up those tracks. Mr. Landsborough, pursuing the instructions furnished to him by the Committee, instituted a search for 200 miles south-west from the Albert, and was compelled from want of water to return to the dépôt. Another party was organised by the South-Australian Government, under the command of Mr. M'Kinlay, with a view of searching the northern districts of South Australia, for the possible relief of the Victorian Expedition.

Finally, to perfect all arrangements, the Committee caused Mr. Howitt to renew his journey to Cooper Creek, for the purpose of re-establishing the dépôt there, and maintaining it so long as the northern search-parties might stand in need of succour. On that officer devolves also the mournful duty of conveying, in compliance with a unanimous vote of the Legislative Assembly, the remains of the fallen leaders of the expedition to an undisturbed and honoured resting-place in the metropolis.

The exertions of the brave men now in the field for the purpose of conveying relief can be of no avail; nevertheless the Committee reflect with gratification on the prospect of these exertions tending to augment the geographical knowledge of the continent which we inhabit, and to promote the expansion of science, and the progress of civilisation and peaceful settlement. They refer, with no small degree of satisfaction, to the fact that the explorers of the Victorian Expedition have been the means of opening a path from the southern settlements to the northern shores, which they hope will, at no distant day, be made available for telegraphic communication, by way of Batavia and India, with the mother country; and they rejoice that now, through a broad belt of fertile land, a connexion has been established between the discoveries of Leichhardt on the Burdekin, those of Burke towards Carpentaria, of Stuart towards Arnheim Land, of Augustus Gregory towards North-Western Australia, and thence by the route of Francis Gregory to the northern tracts of Western Australia.

The important services rendered by King, the sole survivor of the ill-fated expedition, have not been overlooked by your Committee. From the date of Burke's death, in June, to the end of the year, a salary equal to that of the leader has been paid to him.

The Committee have also recommended him to the favourable consideration of the Government, and they have learned with much pleasure that it is the intention of the Government to apply to Parliament to grant him an annuity of 180*l*.

King has not as yet, your Committee regret to state, recovered his health, but it is pleasing to know that the sufferings and privations which he so heroically endured have in no respect lessened his zeal in the cause of exploration.

Your Committee have further the gratification to record that the Government have placed the sum of 4000*l*. on the Estimates, towards the erection of a suitable monument to the memory of Burke and Wills, this sum to be conditionally granted on the additional sum of 2000*l*. being raised by public subscription for the same object; and they would strongly urge on the members of the Royal Society to aid as far as possible any public measures that may be adopted for this purpose.

Your Committee have had the satisfaction of receiving Commander Norman, on the return from Carpentaria of the *Victoria*, after a very successful cruise, the results of which are now before the Society. The Committee are advised

of despatches from Mr. Howitt, dating from Mount Hopeless, to which place he had, in pursuance of instructions, paid a flying visit. On the receipt of these despatches, your Committee will promptly make such arrangements as may be necessary to provide for the possibility of Mr. Landsborough's party reaching Cooper Creek. They left Carpentaria two months after the departure of Mr. Walker, being provisioned for four months with supplies from the *Victoria*.

Having thus submitted a short narrative of the leading events of the past year, your Committee do not wish to conceal from themselves that their conduct, in connexion with the disasters which befel the Expedition, has been censured both by the public and by the Royal Commission which was appointed to inquire into the cause of these misfortunes.

The Victorian Expedition, though crowned with success as regards the extent and value of the country explored, having proved disastrous to human life, your Committee were fully prepared for that condemnation by the unreflecting public which invariably awaits the originators of enterprises similarly unfortunate. Anxious for the fullest investigation, your Committee hailed with satisfaction the appointment of the Royal Commission; and, while they freely admit that that body conducted its investigations with ability and impartiality, they confess they were scarcely prepared for the very grave censure which is conveyed in its Report.

While, therefore, your Committee believe that they are in a position fully to justify their own conduct, they feel that they are precluded from reviewing the Report of the Commission, constituted as it was, and they would prefer silently to submit to unmerited obloquy, rather than reflect on the memory of the lamented leader.

In justice, however, to themselves, as well as to the Society by whom they have been appointed, they are constrained briefly to express their own views as to the causes which led to such unfortunate results.

The fundamental principle which guided your Committee in all their arrangements was the formation of a safe base of operations by establishing a permanent depôt at Cooper Creek, and securing a communication therefrom with the settled districts.

According to instructions, all the efforts of the expedition ought in the first instance to have been directed to effect this important object. It has, therefore, been a source of great regret to your Committee that, in the ardour of his zeal to reach the goal of his ambition, the leader entrusted to others the equipment and stores which should have been taken up to Cooper Creek by himself. This and this alone, your Committee regard as the primary cause of all the calamities which followed.

Mr. Wright failed to reach Cooper Creek in time to relieve Mr. Brahe's party, not solely because he was too late in leaving Menindie, but mainly because he could not find his way there.

In his journal, dated 3rd April, Koorliatto, he says that he resolved on the following day to push on to Bulloo, which "from his northern position he conjectured would be Cooper Creek." From Koorliatto to Bulloo, a distance of 20 miles, Burke's track pursued a course some few degrees to the east of north. In places it was hardly perceptible, but no difficulty was found in regaining it. On arriving at Bulloo, no traces could be found of the advance party having camped there. Beyond Bulloo, which is described as a large "sheet of water extending some five miles to the north, the plains became extremely stony, and the track, turning rapidly to the west, completely obliterated."

From the absence of any certain indication that the leader had changed his route to the westward at this point, Mr. Wright felt convinced that Cooper Creek lay still further in advance, and he made two attempts, one north-

east and the other north-west, for the purpose of tracing the course of the track.

It is obvious, therefore, that Mr. Wright never could have reached Cooper Creek, even if he had followed up the leader immediately, as he was expected to do.

From Bulloo a west-north-west course was taken to Cooper Creek; this it was impossible for Mr. Wright to have discovered except from the tracks, which, unfortunately, from the extremely stony character of the plains, became obliterated at this very point: without them, and unacquainted as he was with surveying, it was impossible for him either to follow the party or ascertain where Cooper Creek lay.

The Committee regret that on their leaving Bulloo their instructions "that their route should be marked as permanently as possible, by leaving records, sowing seeds, building cairns, and marking trees at as many points as possible, consistently with the various other duties," were not observed.

Great allowances have been made for Mr. Brahe leaving the depôt at Cooper Creek, "because a responsibility far beyond his expectations devolved upon him." Your Committee are of opinion that similar allowances, though perhaps in a less degree, might have been extended to Mr. Wright, because, in accepting the command to convey the remainder of the party from Menindie to Cooper Creek, without any surveying knowledge to guide him, he was justified in expecting either that no great deviation would be made from a direct route between those places, or that such deviation would be sufficiently indicated in some conspicuous manner. Had Mr. Wright, on his arrival at Bulloo on the 4th April, exactly known his position and the distance from Cooper Creek, there is no doubt that at all hazards he would have conveyed his party there. On the 3rd April, in his journal, he expresses his anxiety and his determination to move forward, because "he feared Mr. Burke's stores acquired replenishment, and that any party left at Cooper Creek would be anxiously expecting his arrival." At this date the sick (Becker, Stone, and Purcell) were quite capable of being moved forward to Cooper Creek, a distance of 80 miles; and even had they been unequal to the journey, there was nothing to prevent Mr. Wright, who is admitted to be an experienced bushman, if he had known the direction in which Cooper Creek lay, pushing on there by himself, and communicating with the depôt party.

Reassured by the proximity of Mr. Wright's party at Bulloo, with medical aid and an ample supply of stores and equipments, your Committee cannot doubt that Brahe would have gladly held out for a longer period at the depôt.

Your Committee are not conscious of having justly laid themselves open to censure for omitting to urge Mr. Wright's departure from the Darling, sensible though they are of the error he committed in lingering there so long.

Mr. Wright returned to Menindie from Torowotto on the 5th November, and Burke's despatch did not reach the Committee until the 3rd December. They were impressed with the belief that Mr. Wright, in following out his instructions, would leave Menindie as soon as he possibly could; this despatch, therefore, appeared to the Committee to require no action on their part. Mr. Wright had not communicated with them, and his omitting to do so was conclusive evidence to their minds that he wished for nothing, and required nothing from them. Believing, from the tenor of the despatch, that Mr. Wright had left Menindie for Cooper Creek before the despatch itself reached Melbourne, it was clearly unnecessary, in their opinion, to open any correspondence with that gentleman.

The Committee were in receipt, up to the 10th of December, of letters from Dr. Becker of various dates: the latest being the 28th November, one fortnight later than was expected, they could not by any legitimate reasoning arrive at the conclusion, that, because he had not left on the 28th of November, one fortnight later than was expected, he would con-

tinue at Menindie until the 21st of December, the earliest time at which a special messenger could have reached from Melbourne.

Your Committee intrusted the fullest authority to the leader; he appointed Mr. Wright; personally gave that officer definite instructions; and in his despatch to the Committee stated that if Mr. Wright was allowed to follow them out, he felt confident the result would prove satisfactory. So far from imagining that Mr. Wright, at a postal distance of 570 miles from Melbourne, required pressure to carry out instructions received from the leader himself, your Committee were under the impression that the less they interfered with such instructions the better; the more especially as these instructions, though referred to in the despatch, were not forwarded to, or seen by, your Committee. And they are confident that any other persons, not judging *ex post facto*, but placed in a like position, would have arrived at a like conclusion.

They will ever recur with painful memory to the saddening incidents which surrounded the death-scenes of Burke and Wills; and, worst of all, to the imputation that these brave explorers sank under the mortifying conviction that your Committee had faithlessly withdrawn from them that succour and support upon which, in the hour of their need and in the moment of victory, they had confidently relied; but, conscious that they have acted throughout with calm deliberation, and with the most anxious desire to secure the safety as well as the success of the Victorian Expedition, your Committee cannot admit that the disasters of that expedition are to be traced to any oversight on on their part.

Pending the investigation of the Royal Commission, your Committee abstained from presenting at the usual period of the session the Report they have now the honour to submit,

WILLIAM F. STAWELL, Chairman.

2. *Extracts of Despatch from MR. LANDSBOROUGH to the Hon. the COLONIAL SECRETARY, Queensland, dated Bunna-pannah, Darling River, June 1st, 1862.*

I do myself the honour to inform you that the expedition party under my command arrived here yesterday in safety and in good health.

Our route from the Gulf of Carpentaria, Mr. Gregory's route to South Australia, and the routes of other explorers, demonstrate the fact that sheep, cattle, and horses can be taken at a small cost and in the finest condition, from South Australia, Victoria, and New South Wales, and the inland districts of Queensland, to stock the country near the Gulf of Carpentaria, or for exportation to India or elsewhere.

The road we came was so easy from the richness of the pasturage and the abundance of water, that a foal, named "Flinders" from his having been foaled on the Flinders River, followed his mother most bravely from the time he was a few hours old until his arrival here.

When we were on Gregory's route to South Australia, and for some time previously, we took many opportunities of inquiring from the blacks respecting the explorers they had seen. This we were enabled to do, as Jemmy, the native police-trooper, could speak their language. We learned from them that they had seen, during the last ten moons, explorers to the eastward, but that they had seen none with larger animals than horses.

I am sorry to have to inform you that our familiarity at last led to our having a hostile collision with them on the Barcoo River, near where the blacks attempted treacherously to take Mr. Gregory's party by surprise during the night. They tried to take us at night by surprise. If they had succeeded, they would, no doubt, have overpowered us; but it was during Jemmy's, the native trooper's, watch; and, as he always keeps his watch well, he woke us

when they were within a few yards of our fire, and we fortunately succeeded in driving them away. Next morning, very early, two of them came near our camp. At my request, Jemmy warned them to leave us, for that now we had a most hostile feeling towards them. Instead of their showing the least symptom of leaving us, they got their companions, who were in ambush, heavily armed with clubs and throwing-sticks, to join them. Under these circumstances we fired upon them, and, in following them up as far as to where the horses were feeding, one of them was shot and another slightly wounded in the leg.

I had very little assistance from Walker's previous discoveries, as he had left instructions that while his chart and journal were in Captain Norman's charge no one should be allowed to take notes from them. I tried to follow Mr. Walker's tracks to the Flinders River, where he reported he had left the tracks of Burke's party. After tracing them with considerable difficulty for four days we reached plains near the Leichhardt River, where so much rain had fallen on the rich soft soil that it was impossible to trace them farther. From the Leichhardt River we travelled over well-watered country to the Flinders River then up that river through fine rich pastoral country to about latitude $20^{\circ} 30'$, from which we reached "Bowen Downs" in a few miles. The creeks and the river that water that country I knew previously to a certain point down the river, but beyond this point I did not know where the river flowed. On this expedition I followed it down to near its junction with the Barcoo River, and discovered it to be the Thomson River. After leaving the well-watered country of "Bowen Downs," with the assistance of one of the blacks of that locality, we came through a fine rich country to the Barcoo River; then, without following the river farther, or searching ahead for water, we went across to the Warrego River, the horses being for a day and part of a night without water. The country is, therefore, I have no doubt, on the whole, well watered. From the Warrego we tried to go to the south-eastward, but, from not knowing the country, and not finding water, we returned. On this occasion, although the weather was cold, the horses suffered very much. We travelled almost incessantly day and night in going from and returning to water; the horses were without water for seventy-two hours. In returning we found water in a creek in which we found no water at the place we crossed it on our outward route. If I had had plenty of rations, I probably would have searched with one of the aborigines for water before taking the whole of the horses on a journey of that kind.

Afterwards we followed the river down to near Kennedy's No. 19 Camp, to the station of Messrs. Williams, where we received a most hospitable reception, learned the melancholy fate of Messrs. Burke and Wills, sold some expedition supplies which we thought we should not require any more, and bought rations to take us to this. Following the Flinders River up from the Gulf of Carpentaria took us for a long distance in a more southerly than easterly direction, then in a more easterly than southerly direction. About twenty miles below where we left the Flinders River we saw horse-tracks, which were probably made by Mr. Walker's party when on his route from the Nogoa River to the depôt at the Gulf of Carpentaria. Where we saw the tracks of Walker's party the channel was about 120 yards wide, with a sandy bed and a shallow stream flowing along the surface. Lower down and higher up the river we saw the fresh tracks of a steer or cow, and on "Bowen Downs" saw similar tracks. We had so little meat that we would have tried hard to have found the beast to kill it for provisions, if I had not thought, from seeing the tracks of a dray in the same locality, that we were near a station.

The point where we reached the Barcoo River, in latitude $24^{\circ} 37'$, is nearly south from where we left the Flinders River.

Last night I learned that Mr. Howitt had received instructions to wait for

us at the depôt on Cooper Creek. If I had known that there was to have been a depôt there, I would have gladly gone to it from the Thomson River. Now I intend proceeding down the river to Menindie, where I purpose, if necessary, to take the most advisable mode of letting Mr. Howitt know of our return from the Gulf of Carpentaria.

There is a camel on this run, which I will endeavour to get and take to Menindie.

Mr. Bourne, who is a good bushman and a good judge of country, has read this letter, and does not think that I have given a too favourable account of the country along our route from the Gulf of Carpentaria.

3. *Extract of a Letter from JOHN KENT, Esq., to Sir RODERICK MURCHISON, dated Brisbane, Queensland, 17th August, 1862.*

I HAVE sent two tracings, showing Mr. F. Walker's route from the head of the Barcoo to the Gulf of Carpentaria; and as it is the first reliable information given of this portion of the north-eastern interior of New Holland, will prove interesting. It shows conclusively that it is not "all barren from Dan to Beersheba," and proves that if the interior be regarded as a plain, that its greatest elevation would be found at its north-eastern angle. The tropical rains must send down large quantities of water during the north-west monsoon from the nucleus on the granitic range in 19° s., 144° e.; and so long as the interior preserves the character of an elevated table-land, the streams would be perennial. I think there can now be little difficulty in explaining the water-worn appearances on Sturt's desert.

The recent explorations of Burke and Walker prove that between the meridian 138° , to the eastern coast, and south to the Barcoo, is included the most valuable portion of the interior of Australia. For its development, the immigration of Indian coolie labour is essential, and this object will be promoted by establishing a steam-route to Singapore (linking on with the Calcutta and Ceylon line) through Torres Straits; and as the attention of the great cotton interests of Manchester and Paisley is now directed to Queensland, it is much to be desired that they will forward the views of a company recently formed here for placing a line of steamers on that route.

The discovery of auriferous fields near Gladstone, and the Peakdowns of Leichhardt, show that the riches of the Australian Cordilleras are not confined to the southern and central portion; while, the recently proved existence of many thousands of red oxide of copper on the surface, near the latter locality, indicate the extent of our mineral wealth.

I have lately drawn the attention of the Rev. W. B. Clarke to the fact that the eastern coast of New Holland is rising at the rate, say, of an inch per annum, as ascertained by the height of rocks in the Brisbane, above tide-levels, through a period of twenty years; and he assures me that to the south the same result has been inferred, though the observations have not extended through so long a period.

4. *Partial Ascent of Um Shaurur in the Peninsula of Sinai in 1857. By the Rev. FREDERICK HOWLETT.*

MR. HOWLETT has communicated to the Society a coloured sketch of Um Shaurur, taken on the occasion of an attempted ascent to its highest peak. The following are the particulars of the route taken by his party. They left the Convent of St. Catherine's on camel-back at 8.45 A.M., April 30, 1857, and, passing through the Wady Sebayah, Rotik and Rufferah, gained the top

of Nubk Jebel at 12-20, and obtained the first view of Um Shaumur in 25m. later. At 1-30 they rested for an hour, at a good spring under a rock in the Wady Râhabah, 300 yards west of the track, and reached an excellent watering-place in a rocky glen, called Wady Ghadu, at 4-55. The next morning they started at 4-55 A.M., and, delaying an hour for breakfast, descended to the ruined convent of Tiwahat el Deir at 9-15. Thence they attempted the ascent, and reached the small central peak; but were checked by a rock that blocked the only access in attempting the main summit. They returned, and finally reached their former bivouac in the Wady Râhabah at 6 P.M.; and seven hours' travel in the morning of the next day brought the main body of the party back to St Catherine's.

There was a good sprinkling of aromatic herbs on the mountain, but no fennel was observed to justify the presumed derivation of the word Um Shaumur (Mother of Fennel); neither were any of the mysterious sounds heard, which are said to be of frequent occurrence in its neighbourhood. As regards the hypothesis once entertained of Um Shaumur being the Mountain of the Law, Mr. Howlett states there did not appear to be an acre of ground anywhere near Um Shaumur fit for the purposes of an encampment.

5. *The Alps of Dauphiné.* By F. F. TUCKETT, Esq., F.R.G.S.*

Few portions of the mountain system of Europe have been less thoroughly explored than the lofty group of peaks included between the rivers Durance, Drac, and Romanche, and occupying portions of the ancient province of Dauphiné,—the modern departments of the Isère and Hautes Alpes. The area of the entire massif may be roughly computed at about 1100 square miles; but the glacier-developing portion to which the accompanying map is confined, covers little more than half this surface. The mean elevation is very considerable, as the following statements and the general narrowness of the valleys would indicate:—4 peaks above 13,000 and under 14,000 feet; 17 peaks above 12,000 and under 13,000 feet; 29 peaks above 11,000 and under 12,000 feet. Its glaciers (primary and secondary) exceed 100; and under this head, as well as in the height and number of its summits, it may almost challenge comparison with the system of the Finsteraarhorn, though, as respects glaciers, the latter has certainly the advantage in size from the greater extent of névé, a result of its less precipitous formation.

From time to time notices of its topography and physical features have appeared, and the writings of Ladoucette, M. Élie de Beaumont, Professor Lory, and our own countryman, Principal Forbes, have called attention to many of its more striking peculiarities. Within the last four or five years various members of the Alpine Club have penetrated still further into its recesses, and a series of papers in the second series of 'Peaks, Passes, and Glaciers' give evidence of their activity and enterprise. Up to the present time, however, the absence of any reliable map, added to the really intricate relations of the principal summits and valleys, and the fact that few of the explorers had an opportunity of intersecting the district in various directions and studying it in detail, have rendered it difficult to arrive at a clear conception of the mutual relation of its parts.

Under these circumstances I ventured to think that a fresh examination by one who could avail himself of the labours of his predecessors would supply some desiderata, and I therefore devoted ten or twelve days of last July to this

* A photographic reduction of the unpublished M.S. map of Dauphiné, by the Dépôt de la Guerre, has been presented by Mr. Tuckett to the Society. His routes and corrections are marked upon it.

special object. It was important before getting on the ground to obtain all the preliminary information possible, and I was especially desirous of consulting such MS. maps or notes as might be available for my purpose in the Dépôt de la Guerre at Paris. Thanks to the kindness of my friend, Principal Forbes, in putting me in communication with M. E. de Beaumont, and the influence which the latter gentleman was good enough to exert in my favour, I met with the most courteous reception from General Blondel, chief of the Dépôt. Not only did he grant me the utmost liberty in making extracts from the notes of the officers engaged on the national survey, but he allowed the draughtsmen of the bureau to execute for me a beautiful copy of the most important portion of the MS. sheets from which the "Feuille Briançon" will, in the course of five or six years, be produced. I was also furnished with a theodolite by Troughton and Simms (kindly lent by my friend, Mr. W. Mathews, jun., of Birmingham), a mountain-barometer by Negretti and Zambra, an aneroid by Secrétan, boiling-point thermometer by Casella, a "knapsack sleeping-bag" for bivouacking, a supply of portable soup, and a boiling-water apparatus with Russian furnace by Stevenson, of Edinburgh.

Thus equipped, I proceeded through the Vaudois valleys to the scene of operations, testing the capabilities of my knapsack sleeping-bag *en route* by spending a night of snow, fog, and wind, on the summit of Monte Viso. Thanks to the beautiful weather which prevailed throughout my stay in Dauphiné, I was able to pursue my investigations under the most favourable conditions; and in the map now presented to the Royal Geographical Society, together with the hypsometrical table and outlines, are combined the principal results, as well as the important mass of information for which I am wholly indebted to the authorities of the Dépôt de la Guerre.

It is almost impossible, within the limits of a short notice, to explain in detail the conclusions at which I have arrived; but a few additional remarks seem essential. In the first place, I have much pleasure in stating that I find the MS. map of the officers of the État Major extremely accurate on the whole. Nevertheless, there are some mistakes in nomenclature, a few errors in the hypsometrical details, and several omissions, which it was necessary to correct or supply, whilst my expeditions enable me to add three new and very fine passes, the height and position of which I have laid down on the map. In other respects this is merely a photographic reduction of the MS. of the État Major (scale $\frac{1}{250,000}$); but as the engraved sheet will not be accessible to the public till 1867 or 1868, it appeared desirable to deposit a copy with the Royal Geographical Society for general reference.

In order to obtain a survey of the whole district, I first ascended the highest peak of the Grand Pelvoux (previously reached by Messrs. Whymper, Macdonald, and Reynaud, in 1861), and installing the theodolite and barometers on the summit, succeeded, during a stay of four hours, in obtaining a series of observations which enabled me to determine the previously unknown height of the point in question, as well as many other details which need not be enumerated here. The results of the theodolite and barometer are remarkably accordant, and justify the belief that 3954 mètres (12,973 feet) represent very nearly the absolute altitude of my station. This mountain must, therefore, take rank in future as the third in order of height of the group; the Ecrins lying about 4000 mètres to the north-west, and the Meije or Aiguille du Midi de la Grave still further to the north, being both of superior elevation (13,462 and 13,081 feet respectively). At the same time I was enabled to detect an error in the identification by Mr. Whymper (in the paper in 'Peaks, Passes, and Glaciers,' already alluded to) of the mountain known in the valley of La Berarde as l'Alefroide or l'Aillefroide. The peak so designated by him proves on examination to be only one of half-a-dozen summits in the ridge constituting the Pelvoux proper, and stretching out in an easterly direction at

right angles to the watershed, which divides the valleys of La Berarde and Vallouise. The true Alefroide is situated about a mile further to the west, and is the highest point of the main ridge or watershed south of the Ecrins. A comparison of the map, and the outlines taken from the Col de l'Agnello, and near Guilestre, with the description and sketch of Mr. Whymper, will, I think, prove my correctness and explain the misconception.

The series of theodolite readings taken on the Pelvoux, establish beyond question the supremacy of the Ecrins, and completely confirm the altitude of 4103 mètres (13,462 feet) assigned to it by the French engineers. This, the culminating point of the entire group, has three summits, all of which are higher than the loftiest peak of the Pelvoux, being respectively 4103, 4083, and 3980 mètres (13,462, 13,396, and 13,058 feet). As will be seen by the map, it lies in a north-westerly direction, and at a distance of about 4000 mètres from the Pelvoux, from which it is separated by the whole width of the Glacier Noir. The principal summit appears to be a three-sided pyramid, with precipitous faces of rock on the side of La Berarde, and the Glacier Noir, and a more rounded form covered with enormous masses of snow and névé towards the north-east, or in the direction of the upper plateau of the Glacier Blanc (L'Encula). Lastly, it is the identical mountain figured by Forbes in his 'Journal of Excursions in Dauphiné,' under the name of "Montagne d'Oursine," as may be at once seen by comparing my outline from above Les Eclages, with his drawing taken from nearly the same spot. There is no "Montagne d'Oursine" (the name found on the antiquated map of Bourcet, which, however, is the only tolerably accurate one accessible to the public); or rather, this name, that of the "Pointe d'Arcines," and "Les Ecrins," all refer to one and the same summit immediately behind, and nearly due east of, La Berarde.

It only remains to allude to the new passes effected by me. The first, which I have called the Col des Ecrins, leads from Ville Vallouise to La Berarde, and crosses the main ridge which separates their respective valleys at a point to the north of the Ecrins, and between it and the St. Roche Faurio. On the eastern side of the Pass, the route lies up the course of the Glacier Blanc; whilst on the west the descent is accomplished by the Glacier de la Bonne Pierre. The time occupied from Ville Vallouise, exclusive of stoppages, was 10½ hours, and the height, deduced from a comparison of the barometer reading with four inferior stations, is 3415 mètres (11,204 feet), though I have some reason to believe that 3350 mètres would probably be nearer the truth.

Two days later, on the 14th July, I ascended the Glacier de la Pilatte (the Condamine of Bourcet), at the head of the valley of La Berarde, and recrossed the watershed to Ville Vallouise by another new pass, which I have called the Col du Selé, from the glacier of that name, which descends from it on the east to the head of the Combe de Sapièrre. It lies at the south foot of the Alefroide, and furnishes the easiest existing means of communication between the respective valleys. The height deduced from the mean reading of two boiling-point thermometers, carefully corrected and compared with several inferior stations, is 3802 mètres (10,834 feet). The time occupied, excluding halts, was only nine hours, and no difficulties of a serious nature were encountered. The Col de la Tempe, at the head of the Glacier Noir, and nearly intermediate between the Ecrins and the Alefroide, was formerly the only pass by which a direct intercourse was carried on between the inhabitants of the Val St. Christophe and those of the Vallouise, and the discovery of an easier means of communication will, I hope, prove of local advantage.

The third Pass is probably not likely to prove so available for general purposes, but its extreme grandeur renders it very attractive to the mountaineer. This route, which is the same as that of the Col des Ecrins as far as the upper plateau of the Glacier Blanc, leads direct from Ville Vallouise to La Grave in

ten to eleven hours, traversing the ridge which forms the north boundary of the Glacier Blanc, at a height of 3308 mètres (10,853 feet), and descending precipitously to the Glacier d'Arsines. The views to the south and south-west of the Pelvoux, Alefroide, and Ecrins, and to the north-west of the Grande Ruine and Aiguille du Midi de la Grave (La Meije), are unsurpassed in sublimity and interest by any in the whole range of the Alps with which I am acquainted.

It is worthy of remark that in the case of each of the three passes just described, the névés of the Glaciers on the side of the Val Vallouise (the Glaciers Blanc and du Selé) are situated at an elevation of from 900 to 1500 feet above those of the reverse slope (the Glaciers de la Bonne Pierre, de la Pilatte, and d'Arcines)—a circumstance clearly attributable to the greater abruptness of the declivities of the latter, which prevents the accumulation of snow. I owe it to my guides, Michael Croz, of Chamouni, and Peter Perrin, of Zermatt, to state that my success was, in a large measure, due to their assistance; and I cannot conclude without a word in praise of the admirable efficiency of the knapsack sleeping-bag which constituted my almost habitual dormitory during my stay in Dauphiné. It was slightly modified in construction and material from a pattern kindly lent me by Mr. Galton, who imported the general idea from the Pyrenees.

Much yet remains to be accomplished in the way of exploration amongst the mountains of Dauphiné. I have done little more than introduce some sort of order into the confusion in which the district was previously involved, and shall be amply rewarded if I may be allowed to hope that I have contributed, in however slight a degree, to facilitate future research. Of the large number of lofty peaks enumerated in the hypsometrical table, none but the two highest summits of the Pelvoux and five or six others of inferior rank (used as stations by the officers of the *État Major*) have been ascended. A spirited assault was, indeed, made on the Ecrins by Messrs. Mathews and Bonney, a few weeks after my visit; but the state of the snow rendered it abortive, and the monarch of the group still remains as an incentive to the adventurous climber, whilst the Aiguille du Midi de la Grave (La Meije), the Alefroide, and a score of other lofty peaks, challenge attack.

6. *Latest Intelligence from Mr. BAKER in a Letter to J. ARROWSMITH, Esq., dated Khartum, 8th Nov., 1862.*

I LEAVE this on the 1st December with three vessels conveying my transport animals—four horses, four camels, ten mules, ten asses, with an escort of forty-five picked men all armed with double-barrelled guns and rifles, and about the same number of sailors. All my pack-saddles, leather-bags, &c., are so well arranged that I hope to have no trouble in rapid travelling. My animals are of various kinds for various work—thus, if the climate be unpropitious for some, it may nevertheless agree with the others. I have taken such care in preparing for the journey, to the minutest detail, that I trust to succeed.

Hitherto all attempts at an extended exploration beyond Gondokoro have broken down for want of means of transport, the expense of conveying animals from Khartum being very great. My expedition, as it sails from Khartum, will be able to disembark and march on the same day, if necessary. Thus I shall not lose a day upon the White Nile voyage, except at the junctions of the Sobat and the Gazal for observations. I shall push direct for Gondokoro, and from thence to the Cataract. At the last point I shall disembark, and order all the boats to return to Khartum, while I proceed on my land-journey. My first point will be the ivory dépôt of one Andrea Debono, which is the

farthest spot yet reached, and is, I imagine, in about $3^{\circ} 30' N.$ lat. From his men I hope to obtain some information of the adjacent country; but I shall push on, ever south, keeping as near the river as possible until, I trust, I may reach its source. This I hope to accomplish by the end of March. The rains commence at that time in Gondokoro; thus I have no time for delay as I *must* reach the Equator, if possible, before they begin. I shall there construct a zareeba or camp, secured by a stockade, as head-quarters during the rainy season, from which, when weather permits, I may make a reconnaissance of the adjacent country until a return of the dry weather allows further progress. My first objects will then be the Lake Nyanza and traces of Captain Speke. Should I happily reach the Lake, I hope to return to Khartum by striking toward the east, and then, by a northerly course, to reach the head of the Sobat, in the Galla country; in which case I shall construct canoes and descend the river to Khartum. I take tools for this purpose, and also a German carpenter who has been many years in Africa, and who formerly accompanied the Austrian mission to Gondokoro.

Mr. Petherick's vessels and reinforcements are nearly ready, and, when loaded with supplies, they will accompany my boats to Gondokoro, forming a total of six vessels with about two hundred men. I shall hurry these up the river, and I trust I may find him and his party safely arrived at Gondokoro after the unpleasant journey during the last rainy season. He suffered great loss in stores destroyed by the rains and by the leakage of his boats. Further progress being impossible during the south wind, he returned all boats to Khartum, except one, and proceeded by land to Gondokoro, where he determined to await reinforcements.

I have advised the British Consul at Alexandria of the frightful state of affairs upon the White Nile caused by the slave-hunting expeditions of Khartum, in which unfortunately Europeans as well as natives are engaged. This slave-hunting is the cause of all my difficulties. Both Turks and Europeans of Khartum, with few exceptions, being in its favour, together with all Arabs, Syrians, &c., *without* exception, an Englishman is looked upon by this fraternity precisely in the point of view from which a magistrate is regarded by the swell-mob of London.

Mr. Petherick's journey up the White Nile happened to be at the season when other boats were returning; thus one of Andrea Debono's boats loaded with slaves, in charge of the nephew of this estimable British subject, fell directly into his hands. Of course he captured the slaver, and sent him to Cairo; but this has united all classes against him in Khartum, from the Governor down to the commonest White Nile cut-throat.

As Mr. Petherick is the only Englishman in the Soudan, with the exception of myself, the non-discerning public of Africa conclude that I must have some connexion with him: thus I share in the odium which his capture of the Maltese has produced; and for a considerable period I could not obtain a single man, neither could Mr. Petherick's agent engage one for him.

By representations made by the Austrian Consul (Mons. Natterer), and also by me, to the Governor, he was almost forced to issue a proclamation against the slave-trade. This had the effect of frightening the men employed, and they immediately engaged themselves both to Petherick and to me as required.

The spirit of the Egyptian authorities is, however, openly manifested, as the Governor of Khartum (Moosa Pasha), instead of giving the assistance which my firman, sealed by Said Pasha, demands, assumes a totally passive attitude; and I must seek boats from private individuals, at great expense, as I am unable to obtain them from the Government without a responsibility which I decline to accept. I asked for one Government officer to take charge of the boats on the return voyage, without which the crew would assuredly

take to slave-hunting in my absence. This small demand was refused. Thus I must contract for boats to deliver me at the Cataract, the Government declining assistance in a most uncourteous manner. An application made by the British Consul at Alexandria shared the same fate, while French travellers receive assistance in Government troops and cavasses.

I shall, D. V., succeed in perfect independence. It is merely a question of pocket, patience, and perseverance—all of which I shall devote to the object in view. My watch I fortunately got repaired here, and I also purchased two others; my instruments are all in good order, and I possess Nautical Almanacs to the year 1864, inclusive: thus, with good health, and God for my guide through unknown parts, I trust, my dear Sir, to add my mite to geographical science.

PROCEEDINGS
OF
THE ROYAL GEOGRAPHICAL SOCIETY
OF LONDON.

SESSION 1862-63.

Fourth Meeting, January 12th, 1863.

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

PRESENTATIONS.—*Captain L. H. Bagot and Edwin Adams, Esq., were presented upon their election.*

ELECTIONS.—*Commander Edmund R. Freemantle, R.N.; the Hon. Robert H. Meade; Commander Edwin A. Porcher, R.N.; Captain Frederick Sayer; John Osborn Balfour; Wilfred Blunt; William Fridge; Robert S. Gladstone; C. Mitchell Grant; Allan Lambert; Duncan G. Forbes MacDonald, C.E.; Alexander Michie; Champion Wetton; and George Worms, Esqrs., were elected Fellows.*

ACCESSIONS.—Among the Donations to the Library and Map-Rooms since the former Meeting were—Magnetical and Meteorological Observations made at the Government Observatory, Bombay, in 1860; Cuny's 'Journal de Voyage de Siout à El-Obéid'; 'Plans of new System of Chinese Telegraph Signals,' by Comte d'Escayrac de Lauture; Hahr's Statistical Maps of Sweden, &c.; Roosen's Map of Norway; Maps of Australia, showing discoveries of Landsborough and M'Kinlay; Black's General Atlas of the World, new edition; Black's New Map of Scotland; continuation of Dufour's Map of Switzerland; Philip's Imperial Library Atlas; Admiralty Charts; Ordnance Maps, &c. &c.

EXHIBITIONS.—Models of Deep-Sea Sounding Machines, by Dr. Wallich; Model of Floating Cylinder for laying Telegraphic Submarine Cables, by Captain H. J. Selwyn, R.N.; specimens of Rattan Telegraph Cables, by Mr. Duncan, were exhibited.

The Papers read were—

1. *Ocean Currents on the North-East Coast of South America.* By J. A. MANN, Esq., F.R.G.S.

THE current or ocean-stream setting along the north-east coast of South America, from Cape St. Roque to the West India Islands, known as the Guiana current, is supposed to run continuously in a north-west direction, at a rate varying from 1 to 4 knots per hour.

In this paper is given an account of a voyage of the brigantine *Monte Christo*, from Cayenne, in French Guiana, to Paranaíba in Brazil, in July and August, 1862, from which the author considers that the current was at that time reversed in a most unmistakeable manner. The departure was taken from "Ile la Mer," one of the islands known as "Remire" off Cayenne, on the 26th; the wind blowing east, with which a direct northerly course was made until the 30th, when the position of the ship was 7° north, and in the same longitude as Cayenne. On this date the wind changed to the south, and continued to blow from that quarter to the s.s.w. until the 7th of August, when the ship's position by dead reckoning was $42^{\circ} 14'$ W., and an Austrian ship that was spoken, gave the position as 27° W. It was not discovered until some days after, when a second ship was spoken, that the latter was the actual position. From this it appears that for eight consecutive days the *Monte Christo* was drifted at the rate of $4\frac{1}{2}$ knots an hour in an e.s.e. direction, diametrically opposite to the usual flow of the stream. Throughout the remainder of the voyage, extending over a further period of fourteen days, the same current was experienced. The captain of another ship, the *Loyal*, which came into Paranaíba some days after, having a chronometer on board, had abandoned his observations believing his chronometer to be out of order. Also while sailing on board the French man-of-war steamer *Alecton*, from Surinam to Cayenne, the author met with the same phenomenon, leaving little room for doubt that the current was reversed throughout, and for a considerable time.

Mention is made of unusual winds, south and s.s.w., at Surinam. These coming up from the Cordilleras, were very patent, causing influenza and colds; and for some time previous similar complaints had been prevalent throughout the West Indies.

THE PRESIDENT said there was present that distinguished geographer of the seas, Captain Maury, who had recently arrived from America, and who was perhaps better acquainted than any other individual with the currents and tides of the Atlantic. Any observations he might offer upon the subject would be extremely gratifying to the Society.

CAPTAIN MAURY said he had scarcely come prepared to say anything at the Meeting, because, as they might well imagine, his mind for the last year or two had been occupied with subjects entirely different from ocean currents. In fact, much to his regret, he had now very little to do with the sea. Mr. Mann, in his interesting and philosophical paper, set out with a remark that is perfectly correct, and which every physical geographer who has attempted the study of the ocean has no doubt felt to be painfully true,—that these currents were most capricious things: they not only sometimes cease to run, but they occasionally turn and run backwards. The Gulf-stream is one of the most marked and interesting phenomena of the sea. When he was at Bermuda, on his way to England from South Carolina, he had the pleasure of meeting there the officers of some of Her Majesty's ships who had been cruising on the North American station for several years. One of them told him, as corroborative of what Mr. Mann had said, that he had found the Gulf-stream, on his passage from Halifax to Bermuda, actually running to the southward and westward. It struck him as being very singular. The temperature of the water was all right, but his reckoning was all wrong. So, when he went back he thought he would try it again, taking care to verify his instruments. Singularly enough, he found the Gulf-stream not running in its usual course, but running backwards. That the Gulf-stream is this capricious thing of creation needed no other evidence than the singularly mild winter we are now enjoying in Great Britain. In studying ocean-currents we have to look at what they do in the long run, because there are many exceptional cases. The case of the Guiana stream, mentioned by Mr. Mann, is almost as peculiar a phenomenon as that of the Gulf-stream running backwards. The current is well known among all Brazilian navigators; and consequently, when they wish to sail from Para, at the mouth of the Amazon, to Rio de Janeiro, they make a stretch to the northward and westward until they get up to 25° or 30° N., and in longitude 60° ; then getting into the trade-wind they go south again. Thus they dodge those very currents to which Mr. Mann had drawn our attention. Since he had been in England he had received one of the most valuable contributions to our knowledge of the currents of the Equatorial Atlantic that he had ever seen. It was the result of a great deal of patient observation and research by Mr. Capella, the head of the Meteorological Observatory at Lisbon. That gentleman has constructed a wind-chart of the Equatorial Atlantic between the coast of Africa and the coast of America; he has discussed hundreds of observations, and he has established a well-marked current just on the north of the equator setting to the east, and another equally well-marked current just to the south of the equator setting to the west. At the same time he discussed the force of the wind; and he has found, just a little south of the Cape de Verd Islands, taking the form of an ellipse, a region in which the north-east trade-wind blows with the greatest force; and so in like manner he finds between St. Helena and Cape St. Roque a region where, as Jansen had shown, the south-east trade-winds blow with the greatest force. Now, if we have so many exceptions with the winds which have so much to do with currents, we may well expect to find occasional exceptions in the currents themselves.

The PRESIDENT, in presenting the last letter he had received from Dr. Livingstone, took a brief review of his operations on the Shiré river, and said that, pending the delay of carrying his vessel to that river from the Zambesi, he had gone northwards along the coast of Africa to the mouth of the river Rovuma. As that river lies to the north of all territories to which the Portuguese lay claim, Dr. Livingstone was anxious to ascertain how far commercial enterprise could be established between its mouth and the countries watered by the Shiré. He then read the following letter:—

"River Rovuma, Oct. 10, 1862.

"MY DEAR SIR RODERICK,—We have just returned from a month's boat exploration of the Rovuma River. We turned at long. $38^{\circ} 3'$ E. and lat. $11^{\circ} 13'$ S.; so, assuming the longitude of the anchorage to be $40^{\circ} 30'$ E., and lat. $10^{\circ} 28'$ S., we went about 114 miles, as the crow flies, from the coast. Adding our longitude and latitude together, we went 156 miles up the river. It was unusually and excessively low, and entailed frequent dragging of the boats at the crossings. When the water split up into three channels the work was grievous; but having chosen the dry season, when we cannot do much in the Zambesi, we put 'a stout heart to a stey brae,' never stopped except on Sundays, and after 15 days up and 10 down find ourselves rather tired and brown.

"The bed of the river is about three-quarters of a mile wide. It is flanked by a well-wooded table-land, which looks like ranges of hills, 500 feet high. Sometimes the spurs of the high land come close to the water, but generally there is a mile of level alluvial soil between them and the bank. So few people appeared at first, it looked like a 'land to let;' but, having walked up to the edge of the plateau, considerable cultivation was met with, though to make a garden a great mass of brushwood must be cleared away. The women and children fled; but calling to a man not to be afraid, he asked if I had any objection to 'liquor with him,' and brought a cup of native beer. There are many new trees on the slopes, plenty of ebony in some places, and thickets of brushwood. The whole scenery had a light gray appearance, dotted over with masses of green trees, which precede the others in putting on new foliage, for this may be called our winter. Other trees showed their young leaves brownish red, but soon all will be gloriously green. Further up we came to numerous villages, perched on sandbanks in the river. They had villages on shore, too, and plenty of grain stowed away in the woods. They did not fear for their victuals, but were afraid of being stolen themselves. We passed through them all right, civilly declining an invitation to land at a village where two human heads had been cut off. A lot of these river-pilots then followed us till there was only a narrow passage under a high bank, and there let drive their arrows at us. We stopped and expostulated with them for a long time; then got them to one of the boats, and explained to them how easily we could drive them off with our rifles and revolvers, but we wished to be friends, and gave about 30 yards of calico in presents, in proof of friendship. All this time we were within 40 yards of a lot of them, armed with muskets and bows, on the high bank. On parting, as we thought, on friendly terms, and moving on, we received a volley of musket-balls and arrows, four bullet-holes being made in my sail; but finding that we, instead of running away, returned the fire, they took to their heels, and left the conviction that these are the Border ruffians who at various points present obstacles to African exploration—men-stealers, in fact, who care no more for human life than that respectable party in London who stuffed the 'Pioneer's' life-buoys with old straw instead of cork. It was sore against the grain to pay away that calico; it was submitting to be robbed for the sake of peace. It cannot be called 'black mail,' for that implies the rendering of important services by Arabs; nor is it 'custom dues.' It is robbery perpetrated by any one who has a traveller or trader in his power, and, when tamely submitted to, increases in amount till wood, water, grass, and every conceivable subject of offence is made occasion for a fine. On our return we passed quietly through them all, and probably the next English boat will be respected. Beyond these Makonde all were friendly and civil, laying down their arms before they came near us. Much trade is carried on by means of canoes, and we had the company of seven of these small craft for three days. They bring rice and grain down to purchase salt. When about 60 miles up, the table-land mentioned above retires, and we have an immense plain, with detached granite rocks and hills dotted over. Some rocks then appear in the

river, and at last, at our turning point, the bed is all rocky masses, four or five feet high, with the water rushing through by numerous channels. The canoes go through with ease, and we might have taken the boats up also, but we were told that further up the channels were much narrower, and there was a high degree of probability that we should get them smashed in coming down.

"We were on part of the slave-route from the Lake Nyassa to Quilca (Kilwa), about 30 miles below the station of Ndonde, where that route crosses Rovuma, and a little further from the confluence of the Liende, which, arising from the hills on the east of the Lake Nyassa, flows into Rovuma. It is said to be very large, with reeds and aquatic plants growing in it, but at this time only ankle-deep. It contains no rocks till near its sources on the mountains, and between it and the lake the distance is reported to require between two and three days. At the cataracts where we turned there is no rock on the shore, as on the Zambesi, at Kebrabasa, and Murchison's Cataracts. The land is perfectly smooth, and, as far as we could see, the country presented the same flat appearance, with only a few detached hills. The tsetse is met with all along the Rovuma, and the people have no cattle in consequence. They produce large quantities of oil-yielding seeds, as the sesame, or gerzelin, and have hives placed on the trees every few miles. We never saw ebony of equal size to what we met on this river; and as to its navigability, as the mark at which water stands for many months is three feet above what it is now, and it is now said to be a cubit lower than usual, I have no doubt that a vessel drawing when loaded about 18 inches would run with ease during many months of the year. Should English trade be established on the Lake Nyassa, Englishmen will make this their outlet rather than pay dues to the Portuguese.

"We return to put our ship on Nyassa, by the Shiré, because there we have the friendship of all the people, except that of the slave-hunters. Formerly, we found the Shiré people far more hostile than are the Makonde of Rovuma, but now they have confidence in us, and we in them. To leave them now would be to open the country for the slave-hunters to pursue their calling therein, and we should be obliged to go through the whole process of gaining a people's confidence again.

"It may seem to some persons weak to feel a chord vibrating to the dust of her who rests on the banks of the Zambesi, and thinking that the path thereby is consecrated by her remains. We go back to Johanna and Zambesi in a few days. Kind regards to Lady M., and believe me ever affectionately yours,

"DAVID LIVINGSTONE."

The second Paper read was—

2. *Survey of the Physical Condition of the Atlantic Sea-bed, with special regard to the Establishment of Telegraphic Communication between Europe and America.* By G. C. WALLICH, Esq., M.D.

In support of the view that the amount and kind of information heretofore possessed by us regarding the bed of the Atlantic, are altogether inadequate to meet the requirements of Oceanic Telegraphy, Dr. Wallich called attention to the fact that, up to the present period, only one reliable line of soundings has been taken to the southward of N. lat. 55°; and in this line only 41 soundings

occur along the central deep-water area of 1300 miles; the unexplored intervals varying in extent from 30 to 70 miles. Laying stress on the purely arbitrary nature of the evidence on which it has been asserted that the sea-bed is free from those alternations of outline which characterise dry land, Dr. Wallich proceeded to show that continuous mountain ranges might be present within such intervals, and yet necessarily be overlooked; it being very obvious that the detection of a steep gradient must depend on more than one observation as to depth. Now, although no very sudden irregularities in outline can be deduced from a profile of the sea-bed based on such distant measurements, it is hazardous in the extreme to assume that they do not or cannot exist. The sounding of 100 fathoms reported by Lieutenant Sainthill, R.N., within about 32 miles of the position at which Captain Dayman reported a depth of 3000 fathoms, may be cited as one out of many examples in corroboration of this view.

Dr. Wallich then enumerated the various kinds of observations he deems essential in a Survey for Telegraphic purposes; the principal ones being directed towards the procural of accurate information regarding the depths of water, the nature and depth of the submarine deposits, and the temperature, density, pressure, and chemical constitution of the water at various depths. In order the more effectually to carry out these observations, Dr. Wallich has invented several new forms of apparatus, which he exhibited.

Passing on to the means requisite for carrying out his proposed method of survey, Dr. Wallich recommends that Government should specially equip two steamships; that these should sail in parallel courses, removed only two miles from each other; and that they should sound alternately, at intervals of 5 miles, on each margin of the two-mile longitudinal belt thus defined. Hence, whilst the interval between any two soundings on the same line could not exceed five miles (that is, taken by the same vessel under ordinary circumstances), there would only be an interval of two and a half miles between the soundings taken on alternate lines. Having indicated how an adequate exploration of dangerous or doubtful areas might be effected by approximating the soundings much more closely to each other, and taking advantage of information elicited at each step, he suggested that Captain Dayman's line of soundings should form, as it were, the base of operations, and be taken as the centre of the two-mile longitudinal belt to be surveyed. By this means the two-and-a-half-mile diagonal intervals would be again reduced by about a half, wherever one of Captain Dayman's soundings might chance to come into play.

With regard to the period requisite to complete such a survey, Dr. Wallich stated that, allowing, at a most liberal estimate, four hours for each sounding and its concomitant observation, and three sets of observations per diem, and reckoning the extent of the deep-water area to be scrutinised at 1200 miles; each ship would effect 240 soundings in eighty days. But further allowing fifty soundings for exceptional cases and lateral deviation if demanded; with forty days for coaling, and twenty-five during which the state of the weather might render it difficult or impossible to carry on operations successfully; the total number of days would amount to 165, or five and a half months. If, however, we reckon three hours, instead of four, as a fair average term for each set of observations, and four sets to be taken daily (all other conditions remaining the same), each ship would be enabled to complete its 300 soundings in 140 days, or five months. Under either circumstances, supposing the expedition to start between the 15th and 30th April next, as recommended, the survey would be completed before the middle of October at the very latest.

Summing up the benefits likely to accrue from this mode of survey, Dr. Wallich pointed out that we should have no less than 640 reliable observations upon an area of the Atlantic of which we know no more at present than can be gleaned from one-sixteenth of that number; and thus establish a basis upon which the contour of the entire basin of the Atlantic might hereafter be approximately mapped out. In conclusion, he said, the task is unquestionably arduous, and its execution may prove costly; but there it was staring us in the face: a task either to be grappled with manfully and mastered, or else to be left unfulfilled for our successors to carry out.

The PRESIDENT reminded the Society that Dr. Wallich accompanied Sir Leopold M'Clintock in his exploration, and had since published the results in natural history obtained by the expedition, by which he had thrown light on the nature of the animals found at the bottom of the sea, and on the great varieties of soils and subsoils which exist there. The ingenious instrument which he had invented and explained enabled him not only to tap the soft strata, but absolutely to bore the rocks at the bottom of the ocean. Seldom had they had a paper more directly connected with the highest objects of physical geography than the one which Dr. Wallich had brought under their consideration. He had properly told them that unless they make this preliminary survey before any attempts are made to lay down telegraph cables they may find themselves involved in great difficulties. Whether or not any adventurous persons chose to undertake this survey previous to laying down a cable, the Council of the Royal Geographical Society thought it was the duty of a great maritime nation like Great Britain to become as intimately acquainted as possible with the bottom of the sea between England and America, with the view of telegraphic communication being established on a sound basis.

REAR-ADMIRAL SIR EDWARD BELCHER said, as this was a subject more

immediately connected with surveying, he, as senior surveying-officer in England, felt it his duty to answer that portion of the paper. The project of Dr. Wallich would answer very well for a passage across the Irish Channel. But his experience in searching for shoals even within 100 yards of his own ship for six weeks and fourteen hours a day, and the difficulty of finding a rock no larger than the President's chair, led him to the conclusion that any such survey as that projected would cost an immense sum of money and entail an amount of labour which few men would be willing to undergo. At these great depths, while the lead was getting down the vessel might have drifted five, six, or ten miles. It frequently happened in crossing a line of soundings that the wind was blowing on one side, and the line ran out at the weather-beam of the vessel at such a rate that it was utterly impossible to get back again to the spot where the paying-out commenced. It appeared to him that the best course for laying down a cable was that of short lengths, carried from spot to spot, along a line of water where they would find, not the deepest soundings, but a muddy bottom and an absence of mountains and hollows. Such a line as was proposed a year or two ago, from the Hebrides or the Orkneys to the Faröes, thence to Iceland, and then to Greenland, could be laid down at a comparatively trifling expense, with less risk of losing any great portion of the cable, and with greater facility for making an accurate survey of the bottom; whereas to run a cable right across the Atlantic was a project which few telegraph authorities thought desirable. With respect to soundings, he had a long experience in the years 1835 and 1836, and a very accurate instrument was then produced, not only for bringing up the bottom, but also for determining the temperature at a great depth. That instrument was a cylinder within a cylinder, made of stout bell-metal, with a valve opening inwards by pressure at the bottom. The two cylinders, when they went down, slid close home to each other. At a depth of 1200 fathoms the action of the water would force open the valve, and fill the whole interior with water. As you drew the instrument up to the surface the expansion of the water inside was so great that it would burst the vessel but for the provision of the second cylinder, which, slipping out and elongating the internal chamber, doubled the space for containing the air evolved from the water. He used this instrument from the year 1836 to the year 1847 without any difficulty, and without the slightest derangement even of the delicate thermometers that were within. And as to bringing up soundings, he believed there were very few men who could show so many shells as he possessed, brought up from depths of 1200 and 1500 fathoms. He thought, before the question was mooted of applying to Government to carry out a line of soundings at an enormous cost, that they should seek the opinion of scientific men whether it was better to carry a line straight across the Atlantic, or to have four separate stations for the cable.

ADMIRAL ELLIOTT believed, if they carried out the plan proposed by Dr. Wallich and obtained an accurate description of the bed of the sea, that they would be no wiser with regard to the laying down of a telegraph-cable. It was idle to suppose that they could thread their way across the Atlantic in the way proposed, and avoid the mountains and hollows that might exist at the bottom. He believed if they were to carry on the survey for a hundred years that they would still have to run the same risks that at present beset the laying of the cable. Moreover, he agreed with Sir Edward Belcher that the proposed plan of sounding could not be carried out, and he should prefer the method recommended by that distinguished officer instead. To hold in abeyance any attempt to establish telegraphic communication with America until the ocean-bed throughout the entire distance had been accurately sounded would, in his opinion, be an error. Let them be satisfied with the information already obtained, and lay down the cable at once, and if it lasted only two years it would repay the outlay and confer a great public benefit. He did not think the failure of the last cable attributable to the irregularities of the sea-

bottom, but to the great weight of the cable, and to its not having been sufficiently tested before being put on board ship.

CAPTAIN SELWYN, R.N., said Captain Dayman's accurate surveys, on account of his diagrams not being thoroughly understood, had given rise to a supposition that a precipice existed off the shores of Ireland. It had fallen to his lot, in company with an officer of the Admiralty high in the Hydrographic Department, to measure the distance in miles between the soundings and the depth in fathoms. The result was, they arrived at the conclusion that the descent was a little less than the descent of Holborn Hill. Now, it could not be imagined that a cable could be injured by being laid on a descent of that kind. As the extreme depth was about a thousandth part of the extreme length, taking this at 1650 miles, it followed that the depth might be represented by the thickness of a sheet of foolscap paper compared with its length. If there existed anything to cause abrasion, it was utterly impossible to say where they were to avoid it, or where they were to seek it. If they once found a shoal in the ocean, they would have the greatest difficulty in ever finding it again. By no possibility could a man pass over a line which he had once surveyed, with a certainty that he was within five miles of it. Not the best instruments, not the most accomplished navigators, would enable them to find their way out of the fogs of Newfoundland with such accuracy as that. Therefore, it appeared to him they were combating theoretical difficulties, while they had before them real difficulties to be met with. Captain Selwyn alluded to some of these difficulties with respect to the laying of different kinds of cables, and then suggested a shorter route for the deep-sea line by making use of the Newfoundland Bank, which at a certain point, 300 miles this side of Newfoundland, had a depth of water varying from 30 to 200 fathoms.

After some remarks from MR. WEBSTER in favour of laying down the deep-sea cable as the most effective mode of ascertaining the nature of the ocean-bed, Dr. Wallich briefly replied in defence of the plan he recommended, and the Meeting was then adjourned.

Fifth Meeting, Monday, January 26th, 1863.

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

ELECTIONS.—*Lieutenant Francis Duncan, R.N.; Major Frederic John Goldsmid; Captain Edward Menzant; the Rev. Frederick Trestrail; Major Quintus Vivian; John Gardiner Austin; Alfred Barry; Thomas Mossley Crowder; John Emslie; William Gillett; Charles Harvey; Moss Joshua; Frederick John Jourdain; George Macfarlane; J. A. Olding; Frederick John Walker; George C. Wallich, M.D.; Frederick G. A. Williams; and John Wright, Esqrs., were elected Fellows.*

ACCESSIONS.—Among the Accessions to the Library and Map-Rooms since the former Meeting were—'Journal of Landsborough's Expedition in Australia;' 'Mercantile Navy List for 1863;' 'Lees' 'Six Months' Season of the Tropics;' 'Ordnance Survey;' 'Map of Route from Kiachta to Pekin,' &c. &c.

EXHIBITIONS.—Several Japanese Native Maps were exhibited at the Meeting from the Admiralty, Lady Franklin, &c.

The Papers read were—

1. *Proposed Route Across the Isthmus of Kraw.* By Captains FRASER and FORLONG; communicated by Dr. DUNCAN MACPHERSON, M.D., F.R.G.S.

DURING his tour on circuit to the Provinces of Taoof and Mergui, Lieut.-Colonel Fytche proceeded as far as the Pakchan River, the southernmost boundary between the Tenasserim Provinces and Siamese Territory, ascending the stream to a distance of 15 miles. Captain Fraser and Captain Forlong availed themselves of the occasion to explore the direct route from the village of Kraw to the Port of Tayoung, on the Gulf of Siam, a distance of only 30 miles, and lying in about the same parallel. Their report and maps show that there is no high land opposing difficulties to engineering skill to prevent the establishment of an easy means of communication between the Bay of Bengal and the Siamese Gulf, thereby not merely facilitating intercourse with Bangkok, but opening a short route to the further east, which would soon become a highway of considerable traffic.

The numerous deposits of coal which are known to exist in the southern portion of the Tenasserim provinces, warrant a belief that similar deposits will be found in the neighbouring regions, which up to this time have been very little explored.

The steamer *Nemesis* anchored about 15 miles up the River Pakchan, in 5 or 6 fathoms of water. The banks are steep and densely wooded, with a stream running between them of about a mile in breadth at this part. There are some 6 fathoms of water over the bar at the mouth. On the right or British bank are the tin-mines of Mulleywoon, which are said to be workable to any extent to which money and labour are procurable. On the other side are the tin-mines of Rahnong, worked by the Siam Government.

The party left the steamer in a native boat, with a flood tide; proceeded up this river, and at 4 P.M. on the 1st April arrived at Kraw, a Shan village of some fifty houses, with a few Chinese inhabitants. On the 2nd of April they commenced a route-survey across the isthmus. There is a good level cleared road for the first two miles, and to the third mile it rises and passes along the right bank of the Kraw River. The forest on each side consists of bamboos and trees. Up to a little short of the eighth mile the road follows the course of the Kraw River, and is difficult. At the eighth mile they arrived at the watershed of the country, a small grassy plain. The Kraw River runs thence west to join the Pakchan at Kraw; and a

quarter of a mile further on, the river called the Bankren flows to the Gulf of Siam on the East.

At Tasan is a zayat similar to that at Kraw, with a few houses and dry cultivation. The party continued to cross and recross the Tsecompyoon River to the tenth mile. At $17\frac{1}{2}$ miles they reached Assay, another zayat, and were glad to rest for the night. At the 22nd mile they came to the end of the hills, and entered upon a fine open country, with patches of jungle, garden and paddy lands, capable of any amount of cultivation. Here the hills stretched away to the southward, and seemed to run east, parallel with their course. At the 23rd and 25th miles they crossed another river of 120 feet in breadth, the margin of which was much cultivated. At about 30 miles from Kraw they recrossed the Tsecompyoon, where it is about 200 feet broad, and arrived at the residence of the chief civil authority of the district. Tsecompyoon is a large place of some 400 or 500 houses, with a water communication of 20 miles with the Gulf of Siam. Here there is a rise and fall of tide of about 6 feet.

At 2 A.M. on the 4th April they proceeded down a very winding stream to the mouth of the river opening into the Gulf of Siam, where they arrived in about $3\frac{1}{2}$ hours with the tide. There is a bar across the mouth of the River Tsecompyoon, with only $1\frac{1}{2}$ fathom over it at low water. There would be no difficulty in making wharves for large ships, it seemed, nor, in constructing roads from Tsecompyoon to this place. They computed the distance from Tsecompyoon to the sea-shore to be 21 miles, making the total distance from Kraw to the shore of the Gulf about 50 miles. At $7\frac{1}{2}$ A.M. the same day they returned to Tsecompyoon, surveying the river roughly, and passing Tayoung about 4 miles from the mouth.

On the route from Kraw to Tsecompyoon they were struck with a remarkable change of geological series. They had observed, as they emerged on the plains of Tsecompyoon, some remarkably abrupt hills, which proved on examination to consist of sedimentary rocks—and all the islands of the Gulf seemed of the same formation—worn into smooth rounded tops, but with perpendicular sides. The rocks across the Pass were mostly a quartzose sandstone.

The Paper stated that the saving in time between Calcutta and Hong-Kong by this route would be 93 hours; and that 56 hours would be saved from Ceylon to Hong-Kong. While coasting it from Calcutta to Hong-Kong, and touching at four ports, viz., Akyab, Rangoon, Moulmein, and Kraw, 34 hours would be saved over the present route, *via* Singapore.

From Ceylon to Kraw, and thence direct to Calcutta, *two extra* English mails might be carried in $9\frac{1}{2}$ days to the mouth of the Hooghly, necessitating only one extra steamer between Ceylon and Aden, to meet the Bombay mail. The capital required for construction was calculated not to exceed 700,000*l*.

[The paper and maps are printed in full in the Journal of the Asiatic Society of Bengal, iv., 1862.—Ed.]

Mr. CRAWFURD said he had never visited the locality of the projected railway, but he knew pretty well what the nature of it was. Though this peninsula was called by the authors of the Paper a strip of land, it was in extent about twice the size of Ireland, containing an area of 60,000 square miles. The greater part of it was thick forest, and the land was not by any means fertile except in minerals, a little tin, iron, and gold.

He could not, however, agree with the authors of the Paper in believing that the projected plan was in the least degree feasible; on the contrary, he was sure it was impracticable. The distance from shore to shore was 65 miles, of which 15 miles were described to be navigable by the so-called Pakchan River. This in reality was not a river, but an estuary of the sea, with only four or five fathoms of water for half the distance, and but a fathom and a half on the bar at low water. Then came the projected railway of 50 miles, at the terminus of which, on the eastern side of the bay, there happened to be no harbour at all. Such a terminus would never do to carry on the great trade of Europe and India with China and Japan. Then, with respect to the monsoons, the rough monsoon in the bay of Bengal is the south-west monsoon, just the very opposite of that which prevails in the China Sea and along the whole of the eastern coast of the Malay peninsula, where the north-east was the boisterous one; its strength is frequently that of an eight or nine knot breeze. A ship could not with safety lie at the terminus, and even a small vessel of about 120 tons, we find from the Paper, had not been able to come inside the bar.

He was afraid these gentlemen had not taken a very clear view of the question of expense. They assumed that the cost of constructing the line would be about 5000*l*. per mile. This he believed was less than one-half the cost of any single line of railway in this country, and about one-third of the cost of a single line in India. The country is a desolate one: the labour, the iron, and everything would have to be imported, for there was nothing to be obtained there but plenty of wood and stone. No doubt the land could be bought cheaply enough; perhaps the King of Siam, to whom it all belonged, would give it to them for nothing, and it would be worth nothing when they got it.

The object of the Paper was to show that the proposed plan would shorten the route from England and India to China by fifty-six hours. This was not much to gain for the expense of constructing a railway at the estimated cost of a third of a million of money. These gentlemen imagined that the transit of goods across the isthmus would be performed in twelve hours; that is to say, that cargoes could be landed, and transmitted and reshipped, all in twelve hours. It was idle to suppose that with one of Green's or Dunbar's ships of two or three thousand tons, it would be possible to accomplish this in twelve hours. The example of the Suez railway, which they quoted, would not apply. Nothing was sent out by that route but valuable commodities, such as high-priced merchandise, gold, silver, and jewellery; and nothing was brought back but raw silk, elephants' teeth, and India shawls. All the bulky commodities still went round by the Cape of Good Hope, as they have been doing from the days of Vasco di Gama.

As to the alleged dangerous navigation of the straits of Malacca. The straits

of Malacca are about 500 miles long and about 300 miles wide at the broadest part. There are no storms: there are variable winds and squalls, called "Sumatras," because they always blow from the coast of Sumatra, which last about a couple of hours. The Peninsular and Oriental Company have been carrying the mails by this route for the last eighteen years. During that period their ships have made between 600 and 700 voyages through the straits, and have met with only one accident, which was caused by two of their ships running against each other in the dark, when one of them went to the bottom. The merchants of Calcutta and Bombay send their opium to China by this route, and out of 300 voyages made by their steamers not a single loss has occurred. Steamers belonging to the Royal Navy are constantly passing and repassing through the straits of Malacca, and he had never heard of one of them being lost. For the last ten years also the Dutch Government have been sending a vessel once a fortnight, and during the whole of that time have never lost a vessel. He, therefore, took it for granted that the navigation of the straits was not so dangerous as had been alleged.

CAPTAIN ANDERSON said he visited Siam in 1826, when he heard of a tradition among the natives that there had been originally a canal across the isthmus of Kraw. He agreed with Mr. Crawford that the line of country was not suitable for a railway, though it might be for a light road.

With respect to the straits of Malacca, he could speak from experience that the navigation, though dangerous to a certain extent, was not dangerous so far as the harbours were concerned. He had navigated the straits thirty-seven times, and had never met with an accident.

The shortening of the passage to China by the proposed route might be very desirable for the trade of Bengal, but it was not an object of national importance. He believed there were better means of getting to China. One was a proposal by Captain Spry to go overland from Eastern Pegu to Hong-Kong, to make a tramroad part of the way, and to take the telegraph the whole way. He had also himself submitted a project to Government to open a communication with China by the Irrawaddy and Assam, which he believed would be the best route.

The PRESIDENT thought Mr. Crawford and Captain Anderson had given sufficient reasons for not advocating this project. The gentlemen, however, who had made this exploration had placed before the Society for the first time a map of the physical geography of a region which was before unknown, and for this they were well entitled to their thanks.

The second Paper read was—

2. *Visit to the Island of Tsusima, near Japan.* By LAURENCE
OLIPHANT, ESQ., F.R.G.S.

THE Island of Tsusima, which forms one of the entrances to the Inland Sea of Japan, lies eighty miles to the westward of the Straits of Simonesaki. Mr. Oliphant's duties led him at once to its capital, Fatchio, a town of 10,000 inhabitants, where he spent an evening in a diplomatic interview, but was jealously restricted in his movements. A subsequent cruise round its coasts afforded materials for many interesting observations. The whole island is the private property of its Prince, who maintains a garrison of 300

men at Chusan, on the Korean coast, and is bound to the Government of that country and to Japan by relations that are still insufficiently understood. He enjoys a monopoly of the trade with Corea, which furnishes a large proportion of the gold in currency in Japan. The formation of Tsusima is volcanic. It is about 35 miles long by 8 or 10 broad, and its total population is 30,000. It is bisected by a fiord of water running into innumerable creeks of great and sudden depth, where all the navies of the world might lie concealed, and even moored to the trees. The shores of these lanes of water, which invited an exploration that Mr. Oliphant had no leisure to give, are thinly inhabited by fishermen. A virgin forest clothes the hills to their summits, 1670 feet above the sea-level. The fauna of Tsusima are said to resemble those of the Manchurian coast rather than the fauna of the islands of Japan.

The PRESIDENT congratulated the country on possessing diplomatists such as Mr. Oliphant, who had given so lucid an account of a territory which was quite new to us. When he visited these islands he was still suffering from the wounds he had received in the performance of his duties in Japan.

SIR RUTHERFORD ALCOCK said Tsusima was an object of some interest to him when he was in Japan, and also to the Government, because they had reason to know that the Russians had for some time been there with their ships, and had made it a sort of careening port where they made extensive repairs. This attracted the attention of Government, who were anxious to know what was the special attraction at Tsusima, and whether it was an advantage that could be fairly shared by other nations. The reports of Mr. Oliphant and others fully convinced him that if we were in search of a magnificent harbour in these seas, which could be made defensible against attack and be a place of resort for fleets in distress, there was no place which could be chosen with so much advantage. The Russians seemed to find it a very pleasant place; but he believed they had since quitted it and left it to its original proprietors.

He saw some charts on the table which would amply repay inspection, and for which the Society was indebted to that most enterprising geographer, Lady Franklin. If ladies were eligible to be Fellows of the Royal Geographical Society, he thought that lady ought to be elected by acclamation. He had the pleasure of receiving Lady Franklin in Japan on her way home to England on her return from America. These maps which she had brought home were chiefly interesting from the evidence they afforded of the progress which the Japanese had made in trigonometry and topography. One was a plan of Jeddo, a city as large as London, 20 miles in circumference: it was most elaborately laid down, and he knew from practical experience that it was exceedingly accurate. Again, when Captain Ward, of the *Acteon*, was making a survey of a portion of the coast, certain surveys were produced by the Japanese Government to show what they had done themselves. Captain Ward was so astonished at the perfect accuracy of the lines, that he immediately put back in order to obtain copies of these surveys, which were ultimately given. These charts enabled Captain Ward to abridge his labours very much, for by whatever means they had been constructed, he found that they could be entirely relied upon. He did not think the natives made them by our method, and if not, they afforded an idea of the astonishing skill, ingenuity, and perseverance of these people.

From what he had seen of the Japanese, he had great hopes of them, if we could only get over one great difficulty that lay as a stumbling-block in our

path, and that was the existence of a rampant feudalism, such as that which flourished in Europe in former times. The mass of the people had attained a degree of material civilisation which rivalled our own in many respects. They have order and law established among themselves; they have a most elaborate system of mutual responsibility. In arts and manufactures they rival Birmingham, Manchester, and Lyons in many of their products: and yet side by side with all this material civilisation there is a military class of feudal nobles who exercise great power and influence; and it is this which constitutes the great difficulty in the way of all foreign nations who have entered into political and commercial relations with them.

The largest of the islands they call Nipon. Japan is a name not used by the Japanese themselves. The name is derived from two words, juh and pun, "the day-dawn or place of the sun." The Dutch when they came wrote it Jipan, but J they pronounced as our Y. The Japanese have softened the sound, for they speak the softest language out of Italy, and they have turned the J into N. The natives in speaking of their country always call it "Nipon," just as we, in speaking of our country, call it "England," because it forms the largest division of the whole territory.

The PRESIDENT, in the name of the Society, returned thanks to Lady Franklin for these admirable maps.

COMMANDER BULLOCK, R.N., said he could bear strong testimony to the great value and correctness of the Japanese charts. Upon close examination it had been found that every town, mountain-range, valley, post-road, every river and island, and sinuosity of the coast, in every part was delineated with extreme accuracy. These charts, obtained by Sir Rutherford Alcock at the request of Captain Ward, had been the means of enabling us to anticipate the survey of these coasts by at least twenty years.

With regard to Tsusima, the Russians look upon it as a point of extreme importance: they say it is a positive necessity to have a harbour of this kind as a resort for their ships, as it lies midway between the Amur and the coast of China; and for that purpose they established a dépôt there. It is well known that our whaling-ships to the Pacific frequent a port on the north-west side of the island, where they go for wood and water and refit.

In reply to Sir Rutherford Alcock as to how the Japanese effected the surveys referred to, Captain Bullock said an endeavour was made to find that out from the six Japanese officers who accompanied the surveying expedition of Captain Ward. They repudiated all connection with the Jesuits or the Dutch, and they gave the following story; he did not vouch for the correctness of it:—A ruined merchant, somewhere in the middle of the last century, having gained some acquaintance with mathematical instruments from Europeans, thought he would undertake a survey of the islands. This occupied him a period of fifty years, at the end of which time, having presented the charts to his Government, he was restored to his former wealth and to honour. All their positions are accurately correct; their latitudes were never found more than a quarter or half a mile in error. Siebold had informed him that he had no knowledge of the existence of these charts, which had been drawn at Jeddo on three different scales. He has probably, therefore, compiled his chart of Japan, which is an exceedingly correct one, from a smaller edition of the same work, the larger ones being very rare, and said to have been almost all destroyed at the great fire at Jeddo a few years since.

It may be useful to add that Tsusima has a climate milder than that of the surrounding coasts and seas, in consequence of being situated in the Kurosiwa or Gulf-stream of Japan, which has a temperature 10° above that of the neighbouring seas. It is, however, not quite free from snow in winter.

CAPTAIN MALCOLM, R.E., said, when he was in Japan, he made the acquaintance of Colonel Von Siebold, of the Dutch Engineers, commonly known as Dr. Siebold, who showed him some original Japanese surveys of

1786, and told him that in years gone by (about 100 if his memory was correct), a Russian officer had been exploring the coast, and had instructed some of the natives in the art of surveying. There was an Astronomical Board at Jeddo, the President of which Siebold had instructed in astronomy, in taking latitudes, longitudes, &c.; and under his auspices it is believed all the good maps are published.

The PRESIDENT said as no other gentleman wished to speak on the subject of the Paper, he desired to make a communication respecting the exploration of the White Nile. Most of them had seen in the papers the report of the loss of Mr. Consul Petherick and his wife. He had only heard of the loss of this truly enterprising man from the papers. It was a melancholy subject for them to consider, and the loss was deeply to be regretted. The Council of the Society, seriously impressed with the importance of carrying out the enterprise which Mr. Petherick had in view, that of carrying up provisions to the succour of Captains Speke and Grant in the country above Gondokoro, and knowing that that most adventurous person, Mr. Baker, after exploring the tributaries of the Atbara River, was about to proceed on his travels in that direction, resolved to request him to undertake the mission that had been accepted by Mr. Petherick, in case that bold explorer should be no more, and to place at the disposal of Mr. Baker for that purpose the balance of the sum of money which remained in hand out of the subscription raised by geographers in this country to furnish Mr. Petherick with the requisite means.

While upon this subject, he begged to add that he had been informed by Mr. Tinné that the adventurous ladies, of whom mention had been made on a previous occasion as having hired a steamer at Khartûm with the intention of ascending the White Nile, had, according to the last accounts, gone for a whole day of steaming beyond Gondokoro, the station which Mr. Petherick had fixed upon to deposit provisions for the use of Speke and Grant. The names of these ladies would be made known hereafter among those of the ardent explorers of the day. They had returned to Khartûm, where they arrived on the 24th of November, and at that time Mr. Baker was about to proceed on his expedition. He had, therefore, every hope that in the end sufficient supplies might reach Speke and Grant, and that at some future meeting they might be able to report the happy termination of an expedition in which the Geographical Society took so deep an interest.

Sixth Meeting, Monday, February 9th, 1863.

SIR RODERICK I. MURCHISON, K.C.B., PRESIDENT, in the Chair.

PRESENTATIONS.—Captains *E. R. Fremantle, R.N., and C. E. Barrett-Lennard*, were presented upon their election.

ELECTIONS.—Commander *William Arthur, R.N.; Commander Charles J. Bullock, R.N.; Captain John Clayton; Captain Richard Bulkeley Pearce, R.N.; Colonel R. C. H. Taylor; Edward Armitage; William Broughall; Richard Corbet; William Eames Heathfield; James Macbraire; and W. H. Wylde, Esqrs.*, were elected Fellows.

ACCESSIONS.—Among the donations to the Library and Map-rooms since the former meeting were—‘Memoirs of the Geological Survey

of India; twelve sheets of 'Siebold's Atlas,' from Captain Malcolm, R.E.; 'Ethnographical Map of Finland;' Admiralty Charts, &c. &c.

The PRESIDENT.—In opening this meeting, I have a communication to make, which I am sure you will hear with very great satisfaction. Those of you who are in the habit of attending will recollect that our first meeting of the Session happened to fall on the day set apart for the celebration of the birthday of the Prince of Wales, and on that occasion I expressed the hope that ere long His Royal Highness would consent to fill the place occupied by his lamented and illustrious father, as the Vice-Patron of the Royal Geographical Society. I also said that seldom had a Prince become so qualified for such an office, inasmuch as His Royal Highness has travelled over larger tracts of the globe than many of us who are here assembled. I am happy now to be able to announce that I have recently received a letter from General Knollys, in which he states the great gratification which it affords His Royal Highness to accept the distinction, particularly as it was a post which had been occupied by his illustrious Parent.

The PRESIDENT said he ought also to make a communication with reference to the fate of the enterprising traveller, Petherick. He wished it were in his power to dispel the reports of his death, which seemed to have reached Alexandria in some way through the natives. He had no great comfort to offer either to those who were interested in the success of the expedition, or to the friends and relatives of Mr. Petherick, except this, that by the last letter received from Mr. Baker at Khartûm, it appeared that Mr. Consul Petherick, after sending back his water-logged boats to Khartûm, containing his injured provisions, had expressed his determination to go forward on foot; and that instead of proceeding to Gondokoro, or due south, he had deviated to the westward, to a place which he had visited for trade in former years. Probably he had gone far to the west, and had got into a country which was very difficult to traverse at that season, owing to the inundations of various streams and rivers. This deviation from the line which he was expected to take, might explain why no trace of him had been discovered by the adventurous ladies who had gone up from Khartûm, beyond Gondokoro; and it afforded the only ground of hope he could offer, that Mr. Petherick might still be heard of, and that the report of his death was premature. Mr. Tinné, who had been so kind as to communicate all the information they possessed respecting these ladies, would read a short extract from a letter which he had received from one of them relating to Mr. Petherick.

Mr. TINNÉ read the following extract:—

"Khartûm, Dec. 1, 1862.

"The Petherick expedition, of which you no doubt have heard, does not, so far, succeed.

"They left so late that contrary wind from the south had set in against them, and brought them at last to a stop at the Catholic Mission of the Keka.

"They were obliged to leave their boats there with all the fine things they had brought with them from England—iron, conveyances, provisions, &c.—and go by land under a thousand difficulties to Niambara. We could not

learn for certain what had become of them, but negroes told us they had been drowned in crossing a river. I do not know if this be true."

The Papers read were—

1. *Report on the Countries in the neighbourhood of the Niger.*

By DR. W. B. BAIKIE, M.D., F.R.G.S.

DR. BAIKIE advocates the immediate formation of a trading station and a consular establishment on the banks of the Niger. He states that it would secure preponderance and priority for English commerce, and would form a basis for English influence in Central Africa. A permanent establishment would serve to keep rude tribes in check, while it would be far from unpopular with the more settled population. It would afford the missionary and the philanthropist a centre for their Christianizing and civilizing endeavours, and finally it would bring to a practical conclusion the various Niger expeditions. He considers the present to be a most favourable time for such an establishment; ground has been secured and occupied, the foundation of a market laid, the navigation of the river has been opened from the confluence upwards, and there is a general feeling among the natives that we are at length really going to take such a step. He considers the confluence to be decidedly the best position for an establishment. It is the most central, is easily reached from the sea, is the point of convergence of many roads from the interior, is already a recognised market-place, and has proved to be healthy during Dr. Baikie's residence of two years.

Extracts from numerous despatches by Dr. Baikie have been printed by the Foreign Office, and are ordered by the Council of the Royal Geographical Society to be placed in their library. Some of them refer to the country whence cotton may be obtained, in which respect Bonu and Nupe are preferable to Yoruba, because in the former three-fourths of the labouring population are free to raise and sell their own crops, while in Yoruba the chief production is in the hands of large traders, who would infallibly add to their slaves in the event of an enlarged demand. Most of the extracts are purely geographical, and extend or correct Dr. Barth's deductions from native hearsay, or his own observations. Baikie gives the following data on the anomalous rise and fall of the Niger, which was first observed by Barth and minutely discussed in vol. v., p. 5, of that traveller's work. The observation of four years at Busa showed the maximum height to be attained at the end of September; early in October the river begins to fall; during November it falls rapidly; it slackens towards the end of December, and is stationary in January. Between the end of January and the end of

February there is a second rise of from 4 to 18 inches. The rains mostly fall at the end of September, and the reason of the delayed rise of the river lies in the length and sluggishness of its course. In these general ideas Baikie agrees with Barth, whom, however, he appears to have partially misunderstood (as explained in a letter recently received from Dr. Barth.—Ed.).

The Benuwe and Niger are called at their confluence the dark and the white river, and the appellation is just, at the season of low water, for the difference of hue between the two streams is strongly marked at that time, and their waters keep distinct for several miles.

[The latest news of Dr. Baikie, who had left the Niger for the interior, has been brought back by Lieut. Lefroy, R.N. That officer proceeded with H.M.S. *Investigator* up the Niger to Rabba, which he reached on September 12. Thence he made his way by a five days' journey to the camp of King Massaba, where he remained a week. After returning to his ship a messenger from the King reached him on October 9, stating that news had been received from Baikie, who was on his journey back. Unfortunately the rapid fall of the waters of the Niger made it impossible for Lieut. Lefroy to retain his vessel any longer in that portion of the river.—Ed.]

The PRESIDENT reminded the meeting that Dr. Baikie went out upon this African expedition nearly eight years ago, and that the *Pleiad* steamer, in which he and his party were embarked, was lost in going through some of the rapids, very nearly at the point from which he last wrote. In no way discouraged by the loss of the vessel, and saving what he could from the wreck, Dr. Baikie set himself down in the midst of these wild people; and ever since then he had been sending expeditions to the right and left, besides carrying out two expeditions himself to the north-west and the south-east. This perseverance on his part was highly creditable to him, and it showed that the Government had really selected a man capable of accomplishing their behest, and of doing justice to the British name in those regions.

Mr. CRAWFORD said great credit was due to Dr. Baikie for his perseverance, industry, and zeal; but, in his opinion, his judgment was not equal to his industry. The station he had recommended for a settlement on the Niger, in the seventh or eighth degree of latitude, where the temperature was at 80° or 90° on the average the whole year round, was not a place for Europeans to live in.

The PRESIDENT observed that Dr. Baikie had been there eight years.

Mr. CRAWFORD thought he must be a very lucky man. At all events he understood Dr. Baikie was in delicate health, and exceedingly anxious to come back. With respect to the productions of the country that had been spoken of, he should be glad to know what they were. Palm-oil was certainly a valuable commodity, and we imported into this country as much as two millions' worth per annum. Of ivory, though England was one of the greatest consuming countries in the world, our import and export annually did not equal 100,000. Cotton had also been mentioned. Did anybody expect that the negroes would ever grow cotton? The cultivation of cotton required capital, ingenuity, intelligence, protection to life and property; and could

these things be expected from a people in a state of barbarism and slavery? No country in the world was capable of producing cotton in any considerable amount, of a quality fit for our manufacturers, except the Southern States of North America; and, of all countries in the world, Africa was the last that he should expect would ever produce cotton for such a purpose. Then there remained gold-dust, of which but a trifling quantity was produced, merely the washings from the sand. For all these reasons he thought it would be impolitic to form a settlement, as proposed by Dr. Baikie.

Mr. GALTON said that, although the individual items might not be large, there was a considerable amount of trade of one kind or another on the West African coast. Various thriving *entrepôts*, of which Lagos was commercially the most important, were dotted along the seaboard the whole way from the Gabûn to the Senegal. The proposal was that an additional settlement should be established by this country upon the Niger, where the opportunities of trade appeared to be greater than were now enjoyed anywhere along the coast. Confessedly, the West African trade was not of first-class magnitude; but it was not a settlement of first-class importance that Dr. Baikie recommended, merely a small trading establishment. Such an establishment, bringing with it, as it would, all the advantages of European and Christian influence, was a project that he considered might be reasonably entertained on more grounds than one.

The PRESIDENT said, even allowing that all Mr. Crawford's objections were valid, we were still deeply indebted to Dr. Baikie for making us acquainted with the physical geography of this remote region.

2. Notes on Madagascar. By LIEUTENANT OLIVER, R.A.

THE Queen of Madagascar having died in 1861, and being succeeded by her son Radama II., a change was made in the policy of that kingdom. Europeans, who had been previously refused admittance, were freely invited to the capital; and our Government sent in the first instance a message of congratulation, and more recently a mission, in which Lieut. Oliver took part. Their duty was to convey an autograph letter of Her Majesty to the King of Madagascar, accompanied by suitable presents. The distance from Tamatave to the capital occupied eighteen days; the Mission travelled in palanquins carried by strong and willing porters, and traversed a country that seems mainly to be uncultivated, largely wooded, and to consist of such deep and slippery clay as to make progress exceedingly difficult after rains. A ridge of 5000 feet was crossed before coming in sight of the capital. The higher Malagase functionaries have adopted a quasi-European mode of life; the troops attempted European discipline, costume and arms, and the bands played European airs. Mr. Ellis, the distinguished missionary, had a congregation of 1000 Christians in the town, and there were six other congregations of a nearly equal size. Lieut. Oliver shows reason to doubt whether the extension of the Christian profession is the result of much sincere conviction.

The PRESIDENT said Lieut. Oliver is an officer surveying in the Mauritius. He was also anxious to survey Madagascar, and to bring forward in a future communication many interesting and valuable details respecting its physical structure; and he had requested the Royal Geographical Society to aid him in this endeavour. The Council had accordingly authorised a request to be made to His Royal Highness the Commander-in-Chief, to extend Lieut. Oliver's leave of absence for a short time, in order that he might prosecute his researches. No doubt many present were well acquainted with that most charming description of Madagascar given us by that distinguished missionary, the Rev. Mr. Ellis. It must be said to the credit of the missionaries that they had instructed the natives in the rudiments of reading and writing. The Malagasi language was never written until our missionaries went there. The Rev. Mr. Ellis, after an absence of many years, on his return found to his surprise, on disembarking, the native aide-de-camp of a general writing a despatch at the dictation of his superior officer, to be sent to a distant part of the island. It was a proof of the diffusion of writing among these people since the introduction of the art by the missionaries. Mr. Crawford would tell them something about the Malagasi language; that gentleman, who had written the first dictionary of the Malay language, having discovered a considerable mixture of that language in the Malagasi. It must be a subject of great interest to naturalists, including geologists, that this great tract of land, separated by a short distance from Africa, should be so entirely different in almost all its natural productions, particularly in its plants, while many of the animals of Africa were totally unknown there. It had therefore been supposed, theoretically, that this tract of land had been, by former convulsions of nature, separated from the countries to the east, and that, though so near to Africa, it has never had any close connection with that continent.

Mr. CRAWFORD said, in the course of his studies he had had occasion to look into the question of the geography and the philology of Madagascar. The subject that he specially wanted to bring under notice was the presence in the Madagascar language of a very considerable body of Malay and Javanese words. That was a very remarkable circumstance, for how these words came there it was difficult to explain. The nearest point of the Malayan country was 3000 miles distant. He should premise by saying that the people of Madagascar are not Malays, nor do they bear any resemblance to them. They are, in fact, negroes; but negroes of a particular description. They are negroes in the same sense that Portuguese, and Laps, and Englishmen, Germans and Spaniards are Europeans, and in no other. They are slender in their form. Their facial angle is not so acute as that of the ordinary negro. Upon the whole it seemed to him that they are incomparably more advanced in civilization than the people on the opposite coast, although at a distance of no more than 240 miles. A proof of their civilization is that a single language pervades the whole island. This is never found to be the case except where there is a considerable amount of civilization. Another proof is, that as long as we have known the country it has been ruled by one authority, and tolerably well ruled for negroes. Like all other negroes, they are ignorant of letters. No negro nation has ever invented an alphabet. To return to the Malagasi language, he found nearly two hundred words of Malay origin, all of them genuine Malay words, easily discoverable, although disguised by a foreign pronunciation. The language was totally distinct, not only from Malay, but from every other language of Africa. Compound words are to be found in it, of eight, nine, and ten syllables; and in one case he discovered a word of eleven syllables, which would require twenty-three letters to express it. In this respect they are the opposite of the Chinese, who have never yet learned to put two syllables together, their whole language being monosyllabic. Of the Malay words that are to be found in Malagasi, he would first mention the

numerals. The numerals extend from an unit up to one hundred thousand, all taken from the Malay language. Now the common negroes of Africa, such as those met with by Dr. Livingstone for example, can hardly count beyond ten, and very rarely up to a hundred. But here we find these people under the instruction of the Malays, in whatever manner the Malays may have reached them, able to count up to one hundred thousand; and he might add, as a still more curious fact, that the words for "ten thousand" and for "one hundred thousand" are borrowed from the Sanscrit, through the Malay or Javanese. This shows that the migration of the Malays took place after the Sanscrit language had been introduced in considerable amount into the languages of the Malay Archipelago. Among other Malay words that are to be found in the Malagasi are the word for a year and the word for a month. The words for "rice," "rice-field," "rice-mortar," and for "cocoa-nut," "yam," and "capsicum," are pure Malay words, from which he presumed that for the rice, the cocoa-nut, and the other vegetable productions, they were indebted to the Malays. His notion of the way in which these Malay words were brought into Madagascar was this—that a fleet of Malay pirates had been tempest-driven from their own coast, and not able to make their way back; that they had been caught in the south-east monsoon, which blows south of the equator, and had made for the first land that lay in their way, which of course would be Madagascar; that in that way they arrived in sufficient numbers to protect themselves, in the first instance, against the natives, then afterwards imparted to them a certain amount of instruction, and conveyed to them a knowledge of the cultivation and use of these vegetable productions, and finally became absorbed among them by intermarriages. The Malay language had not extended beyond Madagascar, for he had looked carefully into Bishop Colenso's grammar and dictionary of the Zulu language, and he did not find a single Malay word in them.

Mr. CONSUL TAYLOR said, he wished to add his approval of what Dr. Baikie had proposed in the previous paper. He had been in the Niger and Tschadda, in command of the *Pleiad*, in 1854, and had been to and from and residing more or less in various parts of Africa since 1844. He believed there were very many advantages to be derived from establishing a commerce on the Niger. He disagreed with Mr. Crawford's opinion that Africa was the last country to which he should look for cotton. It possessed a most suitable soil and climate, abundance of labour and of water-communication, and it was the birthplace and natural home of the cotton-plant. If it was meant that Africa could not, without an influx of capital, produce as much cotton next year as America did before the war, he quite agreed in the assertion; but he maintained that cotton could be produced in Africa if we went there to seek it. Mr. Taylor pointed out the small area on the map, near Cape Formosa, 200 miles in length, by 100 in depth, from which we obtained palm-oil of the value of a million and a half every year, and asked what might we not expect from the whole of that vast continent if the necessary facilities for trade existed?

The PRESIDENT closed the sitting with the announcement that M. Jules Gérard, the celebrated Algerian lion-killer, who was present, was about to undertake an expedition into Africa. He proposed, in the first instance, to go to the country of Dahomey, thence to Ashanti, and finally to explore and follow the so-called Kong Mountains, of which nothing definite was known, to the British colony of Sierra Leone. Should he succeed thus far, and his health permitted it, he hoped to penetrate from Sierra Leone into the interior, and examine the sources and upper portion of the Niger. It was a great undertaking to accomplish; and, as this distinguished Frenchman was partially assisted by our Government, he hoped he would be able to bring back some useful and important knowledge.

Finally, the PRESIDENT announced that, in consequence of numerous com-

plaints received from Fellows of the Society who cannot obtain seats at the Evening Meeting, the Council call attention to the Rule (Chap. v. Sect. 3, Par. 2):—

“Visitors, if introduced by Fellows, may be present at the Ordinary Meetings; but the privilege of introducing Visitors shall be limited to *one* only, and should a Fellow desire to introduce a second, he is requested to apply to the Acting Secretary for a special card of admission;” and the Council have further resolved,—

“That no Visitor, excepting those *personally* introduced by Fellows, be admitted to the Room before 8.15 P.M.”

The Meeting was then adjourned to Monday, February 23rd.

Seventh Meeting, Monday, February 23rd, 1863.

SIR RODERICK I. MURCHISON, K.C.B., PRESIDENT, in the Chair.

PRESENTATIONS.—*Commander Charles J. Bullock, R.N.; the Chevalier Duprat; Alfred Barry; Antonio Gabrielli; W. E. Heathfield; S. H. Hinde; George Macfarlan; and John Thomas, Esqrs., were presented upon their election.*

ELECTIONS.—*Major Francis J. Richard; Arthur Anderson; James P. Brown; A. Bertie Cator; John L. Ellerton; Robert Gillies, C.E.; Rowland Hamilton; Loton Holland; James H. Kerr, R.N.; James E. McConnell, C.E.; Frederick Pearson; John Ritchie; George M. Robinson; William A. Ross; H. Duncan Shrine; and James Thomson, Esqrs., were elected Fellows.*

ACCESSIONS.—Among the donations to the Library and Map-rooms since the former meeting were—Hughes’ ‘Geography of British History;’ Adams’ ‘Geography Classified;’ Wills’ ‘Successful Exploration through Australia;’ continuation of Philip’s Imperial Library Atlas; Clark’s Map of the Holy Land; Admiralty Charts, Ordnance Maps, &c. &c.

EXHIBITIONS.—Several diagrams illustrative of the Formation of Icebergs in Greenland; Clark’s Map of the Holy Land; Railway and Geological Maps of the United Kingdom, by S. Clarke, &c. &c., were exhibited.

The Papers read were—

1. *Rupert Land, the Colony and its Limits.* By CAPTAIN MILLINGTON H. SYNGE, R.E., F.R.G.S.

THIS paper opened with an allusion to those read before the Society by the same author (*vide* vol. xxii. ‘Journal’), which treated of the physical geography of the interior of British North America, as

demonstrating the feasibility of a communication across it from ocean to ocean. The features of the country were therein described, and the fact of an unbroken natural navigation was shown to exist between the Atlantic and Pacific; as also, by way of the Mackenzie River, between the Arctic Sea and either of the above oceans. Telegraphic intercourse was now about to be established between Canada and British Columbia by the joint efforts of these colonies, and an open intercourse would inevitably follow.

The intervening country was now used merely for hunting purposes, and it was alleged that the remunerative character of the fur-trade would be destroyed by the opening of the country. Its present holders were accordingly averse to the impending steps in that direction. It was not the intention of Captain Synge to recapitulate his former arguments on the advisability of opening the country, but to complete the examination of the case under the aspects of historical and political geography.

The first mention of Rupert Land—and Rupert Land, whatever that may be, is the country over which alone any claim can be advanced by a corporate body—occurs in the charter granted by King Charles II. to a company styled that of "Adventurers trading to Hudson Bay." With the Restoration the spirit of maritime adventure had revived, and the prosecution of an enterprise for the discovery of a short passage to the South Sea was again ardently desired. This object had fired the genius of Columbus; had led to nearly all the brilliant enterprises by which America was discovered, seized, and settled; became subsequently an object of research in a more and more northerly direction, until it finally assumed the name of the North-West Passage. To prosecute this search was the object of the applicants for the charter and also of the King. The grant is specified to be for this purpose, as conducive to the good of the whole people. It is also specified that Rupert Land is to be "a colony," and governed in harmony with the laws of England. This grant is worded so as to convey a monopoly of trade and of land upon the seas and borders of the supposed Passage. Read by this light—that of the day in which the charter was granted—it is obvious that its array of geographical phrases is made for the purpose of legal exhaustion of terms necessary in order to prevent any trespass upon the monopoly; but the whole is bounded by the condition of proximity to the supposititious Passage by the express terms of *coasts and confines*. There is also an *excepting* clause, viz. that the country be not at the time granted to or possessed by the other subjects of the King, or of any other Christian prince or state.

The country at the present day attempted to be claimed under these terms embraces, however, the whole head-waters of the Red River and of the Saskatchewan. These countries are in no wise contiguous to Hudson Straits, and they were occupied by the French or by those who inherited the French pretensions, not by the Company of Adventurers.

This enlarged claim rests exclusively upon a very strained interpretation of the word "rivers." The inland navigations of America are by great lakes, and not by rivers. Besides, the word "rivers" is sufficiently clearly shown to signify the embouchures necessary to give rights upon the *confines* of the Straits, first, by the express use of that term; secondly, by the excepting clause; and thirdly, by the total omission of any reference to a land frontier as determined by a watershed. Historical geography entirely corroborates this view, for no exclusive claims to either the trade or land of the interior was set up until the whole of the traders into these regions were amalgamated into one body after the great conflicts with the North-West Company of Canada. During these conflicts the Hudson Bay Company advanced no pretensions of right to a monopoly. All the public instructions both of the Home and Colonial Governments decide that an equal right existed on either side within legal limits, and it was only subsequently to the amalgamation that it became the common interest of all to set up these pretensions under the only document giving semblance to a right on which these enlarged claims could be based. The French posts extended to Fort Piskayac, on the Saskatchewan, besides others seen by Mackenzie as far as Athabasca Lake.

The country required for the purposes of establishing the overland transit, in the first instance, was not within the limits of Rupert Land; but Rupert Land was a grant in trust for the purpose of attaining the objects of that short and rapid communication.

The PRESIDENT said the object of the author of the Paper was to see established free communication between the two great British possessions upon the east and west of North America. The communication involved other considerations of international law and of the effect to be given to the wording of charters and treaties, upon which few of those present were competent to speak. Fortunately he saw his friend Dr. Travers Twiss near him, and he would ask that gentleman to offer a few observations upon the subject.

Dr. TRAVERS TWISS said, assuming that the Hudson Bay Company had under their charter a power to throw impediments in the way of a passage, whether by telegraph or railway, through the Rocky Mountains, there was still a higher power at home which could remove those impediments; therefore he did not at all despair of overcoming them, assuming that they did exist. In addition to the legal and geographical question, there was also the historical view, which was not precisely as Captain Synge regarded it. The real difficulty which arose in regard to almost all charters and treaties of boundary resulted

from the disposition of diplomatists to take a river as a boundary, which, when traced to its head sources, threw everything into confusion. A difficulty of this character arose between ourselves and the United States, when we came to trace the head-waters of the rivers that were to separate the north-east boundaries. In the grant to the Hudson Bay Company, the phrases "land upon the rivers," "territory upon the rivers," were made use of. It has always been understood, both in grants and treaties, when these words are used, that they mean all the land upon the rivers up to their head-waters—up to the high lands where they take their rise. Assuming for the moment that in the grant to the Hudson Bay Company all the land upon the rivers was included, we then had to trace the head-waters of those rivers; and it would be found, precisely as it was discussed at the Treaty of Utrecht, that we should have to commence with Lake Mistassinnie, then come to the Lake Abitibis, then to the Rainy Lake—the waters of which flow into the Lake of the Woods, and thence into Lake Winnipeg, and finally find their way into Hudson Bay. From the Rainy Lake we must trace a line to the Red Lake, follow that up to Lake Travers, which is at the head of the Red River, in lat. 45°, and thence keep on to the lowest sources of the Saskatchewan, in lat. 48°. Thus we get the real geographical boundary, or the head-water-line, of the grant to the Hudson Bay Company, inasmuch as all these rivers flow northwards, and find their way, through a most intricate navigation, ultimately into Hudson Bay. Of course the grant was limited, if it proved to conflict with a previous grant, or with land in the occupation of other countries. Besides the Hudson Bay Company there was the *Nouvelle France* and the *Louisiana* companies, which had been formed by the French. A great contest arose between us and the French in this part of the country, and the first war was concluded by the Treaty of Byawick, in which the French King recognised the title of William III. to the throne of England; and in return for that William III. recognised what we call the *uti possidetis*, agreeing that the land should remain as it was possessed by the French, no question of right or title being raised. But when we came to the Treaty of Utrecht, in 1713, the French King agreed, not to cede, but to restore, to Queen Anne "all the Bay and Straits of Hudson, and all the coasts, rivers, &c." Commissioners were to be appointed to mark out the boundaries, not landwards, in regard to the sources of rivers, but coastwards; for the real question was, in fact, to determine the extent of Hudson Bay, that portion of water into which these rivers flowed. Those Commissioners were never appointed: consequently no boundary was ever determined under that treaty between the English and French possessions. Now, the question which Captain Synge raised about the French possessions extending indefinitely northwards, was the great argument used by the United States Government against ourselves in 1846, in connexion with the Oregon boundary, in regard to which it claimed to have succeeded to the French rights in Louisiana, which originally belonged to the French, and who really penetrated as far north as the Athabaska Lake, where Mackenzie, in his first great exploration, discovered the remains of two small French settlements. The Americans claimed 49° as the boundary, alleging that that was the line agreed upon at the Treaty of Utrecht as the boundary between the English and French possessions, and claiming to have succeeded to the French title under that treaty. But in 1763, after the siege of Quebec, when the whole of Canada was ceded to us, the French Governor, the Marquis de Vaudreuil, named the Red Lake, where the waters commence to flow northwards, as the northernmost point of Canada; and therefore, so far, conceded that the political boundary of the French possessions did not extend higher than the Red Lake. He now came to what really was the meaning of the charter of the Hudson Bay Company. That charter gave the Company all the country, all the coasts, and all the rivers flowing into Hudson Bay and Hudson Straits. Whatever questions might arise as to that definition, about the rivers there was no diffi-

culty whatever, because after the Treaty of Utrecht all the rivers flowing into Hudson Bay were conceded to be British rivers. It seemed to him, therefore, that the historical view was opposed to what Captain Syngé had stated, further than the fact of the extension of French settlements of hunters as far as the Lake Athabaska. Nor was the argument quite consistent with the legal interpretation of the word "rivers." At the same time what he had told us was extremely interesting, because of the great prospective importance of that country; it possessed enormous mineral wealth, which would one day be explored and worked.

Captain SYNGÉ expressed his satisfaction that the question had been taken up in the manner in which it had been dealt with by Dr. Twiss. The opening of the country as a route to the Pacific appeared close at hand, and it was this circumstance that gave so great, immediate, and practical an interest to the subject. He had been greatly struck eleven years ago when first bringing before the Society the physical geography of the country of interior British North America, as proving the feasibility of such a route, and the particulars of the direction-posts and characteristics of the latter, that the discussion which ensued instantly took the form of an attack on the Hudson Bay Company. He subsequently found all those who were in favour of the country, were strongly under the impression that the Company was the obstruction really in the way. Now he himself at that time knew the Hudson Bay Company only by name. He had not then examined the charter at all. Satisfied that no such antagonism existed between the assumed proprietary of so magnificent a territory and those who were strenuously seeking to develop its resources to the utmost, he brought this view under the consideration of the Board of the Company; but without effect. The reply practically amounted to this—that the fur-trade was remunerative and met all their desires. The Company had not, however, been content with a passive opposition. They were, in fact, in many forms the vigorous opponents of every effort to open up the country. The position was, therefore, this:—The Company apparently most interested in the success of the efforts he and others were contending for, were the most resolutely hostile to all those efforts. There appeared, therefore, but one alternative as a solution of this line of conduct. Either we must be entirely mistaken as to the value of the country and of the route, or tenure of that country by the Company was invalid. He had purposely confined himself as much as possible to the geographical investigation of the limits of Rupert Land, and had intentionally glanced as briefly as possible at the historical confirmation of the limits as he had sketched and believed them to be; but he hoped he had shown it to be beyond dispute that Rupert Land was held as a trust only, and that the object of that trust was identical with that which gave its present interest to the question, viz, the opening of a communication with the Pacific. He could not adopt the principle contended for by Dr. Twiss, that the inland navigations of North America came under the category of rivers. The great lakes were not the St. Lawrence. Under any circumstances all the interior country, as he had shown he trusted, sufficiently clearly, however briefly, came under the excepting clause. The Hudson Bay Company evidently had no claim to it; nor, until recently, had they advanced any under their charter. In 1817, when the Hudson Bay and the North-West Companies were brought face to face, the Hudson Bay Company made no pretension to monopoly; they did not call upon the Government to protect them; but the most peremptory instructions were sent by the Home and Colonial Governments that the conflicts of the Companies' servants were to be put a stop to, and all impediments raised on either side against any traders or others of the King's subjects were to be removed. If their monopoly dated from 1803, how could they claim it under their charter? The question could not be avoided, for the settlement of the

country, shown to be imminent, could not take place without the grant and transfer of land. It became indispensably necessary therefore to inquire with whom, if with any one but the Crown, a title to grant lay, and to what that title amounted and over what it extended. To effect a legal transfer there must be a legal title. That title, if legal, extended over Rupert Land. Hence the interest and importance of the question—What are its limits?

The PRESIDENT, in thanking Captain Syngé for his communication, said the Geographical Society, happily, were not called upon to settle that question.

2. *On the discharge of Water from the Interior of Greenland, through Springs underneath the Ice.* By DR. H. RINK, of Greenland.

DR. RINK calculates the yearly amount of precipitation on Greenland, in the form of snow and rain, at 12 inches, and that of the outpour of ice by its glaciers at 2 inches. He considers that only a small part of the remaining 10 inches is disposed of by evaporation, and argues that the remainder must be carried to the sea in the form of sub-glacial rivers. He shows that copious springs of fresh water boil up through the sea in front of the glaciers that advance into it, and states that their positions are conspicuously pointed out by flocks of sea-birds, which invariably hover over them in evident search of some food, whatever it may be, which they always find there. He also specifies a lake adjacent to the outfall of a glacier into the sea, which has an irregularly intermittent rise and fall. Whenever it rises the sea-springs disappear; when it sinks they burst out afresh, showing a direct connection between the springs and a sub-glacial river. Arguing from what has been observed in the Alps, he concludes that an amount of glacier-water equivalent to 10 inches of precipitation on the whole surface of Greenland, is no extravagant hypothesis, and he accounts for its presence partly by the transmission of terrestrial heat to the lowest layer of the ice, and partly from the fact that the summer heats are conveyed into the body of the glacier, while the winter cold never reaches it. The heat melts the surface-snow into water, which percolates the ice, while the cold penetrates a very inconsiderable portion of the glacier, whose thickness exceeds 2000 feet.

The PRESIDENT said this was a most important communication. Dr. Rink brought before them the most convincing proof of the truth of what had been long established by the labours of Agassiz, Forbes, and Charpentier, and other geologists, that glaciers were simply frozen rivers; and, in showing that these frozen masses move to the coast, he has calculated that about one-sixth of their whole volume really consists of water. The subject was of great interest, particularly to persons who, like himself, happened to have been born in the north of Scotland; because geologists had recently satisfied themselves that all the northern part of Scotland has been under pre-

cisely the same conditions as Greenland is now, covered in its centre by great snowy frozen masses, which advanced towards the coast, and emptied themselves by glaciers. They were fortunate in having valuable illustrations of Dr. Rink's Paper, furnished by Colonel Shaffner, who went out with the first expedition to determine the possibility of establishing telegraphic communication with these countries, and to ascertain the nature of the difficulties in approaching these great glaciers. It was the latter difficulty which had been particularly adverted to by the author of the Paper: and he described how in one of these great masses of ice they even found an interior lake. This was a point exceedingly interesting to geologists, for they had recently had under discussion the subject of the parallel roads of Glenroy, in the Highlands, where it seemed impossible to account for certain terraces of gravel at different altitudes, except upon the supposition that there was once an interior lake there, which was barred up by a glacier. This icy lake spoken of by Dr. Rink seemed to throw some light upon the subject. As his friend Professor Ramsay the President of the Geological Society, who had written most ably upon glacial action, both in our own country and in the Alps, was present, he should be happy to hear his observations on the subject.

Professor RAMSAY said the study of glacial phenomena had been for many years a subject of special interest to him, for, as geologists knew, much of the northern hemisphere had at one time been as deeply buried under ice as Greenland was now. He believed that all those appearances which thrust themselves on glacialists wherever they went in the north of Europe, would never be clearly understood until they had been studied in Greenland by a man who, besides being a mere student of ice, was thoroughly conversant with all the glacial phenomena of that period of time when the northern hemisphere was, to a great extent, covered by ice. This ancient ice-covering was positively true; for all the phenomena that glacialists are familiar with in Switzerland, from the days of De Saussure downwards, are as clearly written upon the rocks of our own island, of the Scandinavian peninsula, of the Black Forest, of the Vosges, of the highlands of Scotland and Wales, as they are upon the Alps in places which the ice only left, as it were, last year. Until people went and saw what was going on in Greenland, which was now undergoing the very same process that our own island underwent, there would inevitably be a great many phenomena which we could not clearly understand. The Paper was an exceedingly clear exposition of some part of these phenomena, but he was bound to say it was an exposition of what most men who had studied ice were familiar with. The author wished clearly to show that the country was drained by ice, but drained not by ice alone, but by water flowing under the ice. Everyone who had visited the glacier of the Rhone, or the glacier of the Aar, or the Glacier du Bois, must have seen a ready-made river from under the ice flowing out upon the land. Dr. Rink explained that the same ready-made rivers flowed from under the ice as it floated out to sea, and rose to the surface, as it were, in boiling springs. This rush of water was due, not to the circumstance merely of springs rising out of the rocks underneath the ice, but more to the circumstance that the ice a few feet below the surface, even in the extremest cold of the most Arctic winters, was always just about melting temperature. Dr. Sutherland, who went in one of the voyages in search of Sir John Franklin, observed that the surface of the ice in extreme Arctic regions, unlike the surface of the ice in the glaciers of the Alps, is much more rugged, because the extremest cold never penetrates down below a depth of 8 or 10 feet. To that depth all ice is frozen below the temperature of 32° ; but below that depth, even in winter, the temperature is always at 32° , a little more or less, and the lower strata of ice flowing faster than the upper, the upper strata are broken in this irregular manner. Some years ago Dr. Kane showed that all the winter through, from underneath a glacier which he estimated at 3000 feet in thick-

ness, a stream of fresh water was constantly flowing. Here, therefore, we had a confirmation of the observations made by Dr. Rink, which in this respect are not new, though he has brought it before us in a very prominent manner.

Dr. RAE said one of the glaciers he visited had been evidently an ice-giving-off glacier at one time, but the quantity of mud formed from the trituration of the rocks by ice-action, and carried down by the rivers of which Dr. Rink had spoken, had probably filled up the head of the fiord, so that the ice had not had depth of water enough to float it off. With regard to the number of birds seen at the "springs" usually found near the edge of an ice-blink, the birds went there to feed on certain small marine insects resembling very minute shrimps, which on the Arctic coast are almost invariably found where fresh water flows into the salt. These insects being brought to the surface by the flowing upwards of the fresh water through the salt, in consequence of its less specific gravity, are easily caught by the gulls and other waterfowl.

Mr. ROBERT CHAMBERS said, in his opinion, this Paper and the former Paper of Dr. Rink only partially illustrated the great glacial subject. He thought this glacier spoken of resembled the sub-aerial glaciers which are found in Alpine regions, only that it was spread over a wider extent of country. They had only to imagine the sea about 2000 feet higher than it is round the Alps, and they would have the *Glacier du Bois* discharging itself into the sea in the same way that this Greenland glacier was now doing. What he wished more particularly to remark was, that the early general glaciation of the northern regions, by which the surface of those countries had been moulded, and which was chronicled in Scotland by the boulder clay, was, in his opinion, independent of such explanations as this.

COLONEL SHAFFNER explained the diagrams he had prepared, representing the various glaciers, fiords, and icebergs on the coast of Greenland.

The Meeting was then adjourned.

ADDITIONAL NOTICE.

(Printed by order of Council.)

- I. *Extracts from a Letter of SAMUEL W. BAKER, Esq., F.R.G.S., to Rear-Admiral the Hon. HENRY MURRAY. Dated Khartûm, 24th Nov., 1862.*

"The steamer engaged by the adventurous Dutch ladies returned from Gondokoro on the 19th instant, bringing unsatisfactory news of Petherick. He left Abokooka (in the Kyth country) about the 15th July. The steamer left this spot about 31st last month (October), thus *three months and a half* had elapsed since Petherick's departure. From Abokooka he had been obliged to force porters for the land journey. He left the greater portion of his stores at Poncet's dépôt at that place, and returned to Khartûm three boats with an immense amount of effects damaged by the rains. Instead of proceeding direct to Gondokoro from Abokooka as I had supposed, by a route said to be firm ground, he went to his ivory establishment in the Jamberra, on the Djour, in a s.s.w. direction. This route is said to be almost impassable during the rains, as the tract of country is intersected by numerous large *hors* or rivers and deep morasses, which are at that season flooded. Since

his departure only three or four of the large number of his porters have returned to Abookooka, and they reported the country to be in a flooded state, and that it was impossible to proceed; most likely these rascals had bolted. Beyond this there was no news.

"In this country beyond all others, success in exploration depends upon a knowledge and choice of seasons: delay is fatal. The north wind is fickle until about the 20th November, and even then its force is hardly felt beyond the Sobat junction. Boats leaving this on the 1st December are said to reach Gondokoro as soon as those which start a fortnight earlier, as they carry the wind with them throughout the route. The rains, which do not set in here until August, commence at Gondokoro, and further south, early in April. Thus a successful passage to Lake Nyanza depends upon a start from Gondokoro, not later than 1st February. Leaving Khartûm on 1st December, I should be at the foot of the cataract beyond Gondokoro by the 20th January: i. e. fifty days, including stoppages for observations at the Sobat and Bahr Gazal junctions. This cataract is nine hours' steaming from Gondokoro, by the account kept by the Dutch ladies, and the river is very free from windings; thus the last point to be reached by boats must be upon the fourth degree of N. lat., as nearly as possible, or about 50 miles south of Gondokoro. I shall only remain at Gondokoro a couple of days to discharge my store of corn at the depôt, and I shall at once push on to the cataract and there disembark. Without losing a day unnecessarily, I shall then march for the Nile sources.

"The actual distance from the cataract not exceeding 240 geographical miles, allowing 20 per cent. for deviations of route, will make the journey to the equator about 340 statute miles. Say that I leave the cataract on the 1st February, and that near the equator the rains begin on the 15th March; I have some forty days' dry weather to depend upon, which should bring me there without difficulty—the average being under 9 miles per diem. At the last point attainable before the rains I shall make a fortified camp, and make all snug for men and beasts. During the fine intervals in the wet season I shall make excursions to all points, leaving half my men at the head-quarters. If I get into a good shooting country I have no fear, as the excitement of the chase and the abundant supply of flesh keeps all men in good humour, and ensures the friendship of the natives.

"I have worked incessantly to arrange my expedition with order. The great difficulty in these countries is to establish a regular discipline among the men. Forty of my men are armed with double-barrelled guns and rifles; forty-five form the escort, including one captain and four chourkes, one of the latter to every ten men. I have put them all in uniform, without which it is impossible to discipline them; there is one drummer and one ensign: and I can safely say that a greater set of blackguards never followed the English flag. One great blessing in my intended route is this; when once past the ivory traders' establishments my men dare not desert, as the natives would murder them on the road back. I have expended much trouble in procuring transport-animals, including horses, camels, donkeys, and mules; but I have been disappointed in the expected purchase of ten of the latter, and they are difficult to procure. In all I have twenty-eight animals, and I shall take another couple of donkeys in the cabin if I cannot find room for them elsewhere. With thirty animals I can travel independently of porters, who are the curse of explorations.

The instruments you kindly lent me are in excellent order. I have three watches, which I pack in cotton wool, secured in a small tin-box: thus I trust they will keep their health; but there is a regular epidemic among watches in these parts.

"From inquiries I have made of traders, black, white, and brown, I am of

opinion that the source of the Nile will be found as nearly as possible upon the Equator. I do not believe that the Lake Nyanza has anything to do with the river. The latter must be the effects of innumerable drains from high lands on this side (north) of the lake. I expect to arrive at a network of mountain-torrents, which, though dry at certain periods, bring the entire rainfall of the mountains to the main river during the wet season.

"The Athara brings to the Nile the rainfall of Abyssinia, supplied by the Settite or Tacazzy, the Salaam, and Angarep rivers. The Rahad and Dinder also drain the westerly portion of the Abyssinian range into the Blue Nile, while the latter brings the main supply from the mountains adjoining the Galla frontier. The Sobat without doubt rises in the south-westerly corners of the Galla country bordering the Berri, as the ivory hunters speak of a river about eighteen days' journey east of Gondokoro. This must be one of the Sobat arteries coming from the same elevated land which supplies the White River direct. The Djour runs parallel with the White River west from Gondokoro, evidently coming from the same high land. Thus by analogy one may presume that the main Nile is supplied by the northern watershed of the great chain of highlands running through Abyssinia, the Galla country, and equatorial Africa; and that the Nyanza and other lakes of Central Africa are reservoirs from the southern watershed of the same highlands, at a level so low that there is no escape for the accumulated waters.

"The Sobat runs out so suddenly upon the cessation of the rains that a boat is left in the mud without depth of water for a return to the White Nile. This proves that equatorial mountain-torrents supply that river: in my opinion the White Nile has a similar origin. The steamer with the exploring Dutch ladies (La Baronne Tinné, her sister, and daughter) has been unable to ascend the Sobat for want of fuel. Its course is through vast treeless plains of high grass. With determined pluck they used all their furniture for fuel, in the hopes of reaching some spot of forest, but at length with exhausted fires they floated slowly to the White Nile."

PROCEEDINGS
OF
THE ROYAL GEOGRAPHICAL SOCIETY
OF LONDON.

SESSION 1862-63.

Eighth Meeting, Monday, March 9th, 1863.

SIR RODERICK I. MURCHISON, K.C.B., PRESIDENT, in the Chair.

PRESENTATIONS.—*Rowland Hamilton, Esq., the Rev. F. Trestrail, and the Rev. C. R. Gordon, were presented upon their Election.*

ELECTIONS.—*Brigadier-General John R. A. St. George, C.B.; Colonel Charles Sawyer; R. Brinsley Sheridan, M.P.; D. J. Kennelly; A. H. Barford; H. Bayley; John Burns; J. Duncan Campbell; R. R. Carew; Spencer Chapman; Frederick P. Dalgety; J. Vesey Fitzgerald Foster; Frederick Gascoigne; Edward William Jeffreys; George Scovell; George Stanton; and Robert Swinhoe, Esqrs., were elected Fellows.*

ACCESSIONS.—*Among the donations to the Library and Map-rooms since the former meeting were—Stanford's New Map of Australia, constructed by A. Keith Johnston; Admiralty Charts, Ordnance Maps, &c. &c.*

The PRESIDENT said before calling upon the Secretaries to read the Papers he had a communication to make, giving some slight hopes that Mr. and Mrs. Petherick might be still alive.

A letter had been received by Mr. Lennox Cunningham, of the Foreign Office, from Mr. Sidney Smith Sanders, H.M. Consul at Alexandria, stating that no reliance was placed there upon the incoherent reports of the death of Mr. Petherick, and enclosing a copy of a letter from the wife of a French merchant at Khartûm, dated the 4th of December, in which the writer gave as the latest information of the movements of Consul Petherick and his party that they had passed into the interior of the country with a great many porters, whom they were obliged to manacle at night, and that wishing to cross a branch of a river they might have been upset and drowned; "but," added the writer, "the uncertainty as to their being saved or drowned is still in suspense."

The Secretaries would now read the itineraries of those adventurous Australian explorers, Stuart, Landsborough, and M'Kinlay.

The Papers read were—

1. *Explorations from Adelaide across the Continent of Australia.* By J. McDOUALL STUART.

THIS expedition proceeded along the previous route until they reached the point attained by Mr. Stuart in 1861, from which he was obliged to retire in consequence of the inability of his small party to penetrate further.

The dense scrub that had in 1861 formed an insurmountable barrier was penetrated after six weeks' incessant labour, and the other side was reached in safety and without loss.

On getting into clear country again and taking observations, they found themselves in lat. $16^{\circ} 40'$. Ten miles further on, or lat. $16^{\circ} 30'$, they struck on a large river, apparently a branch of the Roper River, which they followed down until its confluence with the main stream, known as the Roper River. They found that it took its source in some rocky and hilly land, through which they crossed several creeks running in a north-east direction, until they reached the table-land in lat. $13^{\circ} 50'$ and in long. $132^{\circ} 30'$. They crossed this table-land and came upon a large river with a strong current, running through well-grassed country, admirably adapted for grazing and agricultural purposes. The river ran in a north-west direction, and the party followed its course for a considerable distance, until in lat. $12^{\circ} 50'$ and long. $131^{\circ} 40'$ it changed to due north. On this course they travelled for about 30 miles, and then struck due east for about 10 to 15 miles; after which due north to the seaport in Van Diemen Gulf, which was reached on the 24th July, 1862; and on the following day they planted their flag on the beach amid great cheering from the party.

The point on the coast reached was a promontory marked on the Admiralty Charts as being 30 miles east of Cape Hotham.

The river, which they followed, ran about 40 miles parallel with a river marked on the map as the Adelaide, the difference in the longitude being only from 6 to 12 miles. Stuart passed through much good country, well fitted for agricultural and pastoral purposes. Leichhardt had previously seen this tract, and noticed it in terms not less favourable. Even in the scrub water seems to have been found in sufficient quantities to satisfy the wants of all the party, including the horses, obviating any necessity for carrying a supply from camp to camp beyond Newcastle Water.

They were not nearly so fortunate on the return route, being more than two whole days before they obtained a necessary sup-

ply—the only occasion on which they were inconvenienced by its want.

Their provisions held out till the latter part of their journey, when they were compelled to sacrifice three of their horses for food.

Mr. Stuart met M'Kinlay at the Kapanda Station; and at the Adelaide Station Mr. Howitt's party were among the first to welcome him home after his laborious but successful mission.

2. *Exploration of the Interior of Australia.* By Mr. LANDSBOROUGH.

MR. LANDSBOROUGH, who had previously (Proceedings, vol. vii. p. 5) explored south-westerly for 300 miles, started from the Gulf of Carpentaria on the 10th February, 1862, following the Leichhardt for some distance, and turning off near the falls in a direction E.S.E. over a grassy country. This terminated in some picturesque hills, among which it was thought that a sheep establishment would be well placed. Beyond the hills there was more wood and less pasture. The Flinders was crossed on the 19th, followed for some time, and finally left on the 1st March in lat. $20^{\circ} 3'$. Near Mounts Little and Brown the river is deep, and seems perennial. The country is probably thinly inhabited, as the first native was seen on 1st March. The rains in this month were heavy, and rendered the ground soft and difficult. The pasture continued good, with sufficient wood for fuel; but the country would not bear a great amount of live stock, and both water-tanks and annual grass sowing would be necessary. While still on the Flinders a blue range of mountains was visible, and named Branston Range; another mountain was named after Frederick Walker. On the 22nd March the party encamped on the Jardine Creek, an affluent of the river which they had followed so long. On the 26th, while tracing out the neighbouring creeks, draytracks were seen, probably those of persons who have occupied Bowen Down, a district discovered two years previously by Mr. R. Buchannan. On the 29th the party reached Landsborough Creek, leading to Thomson River, where Landsborough came upon an old camp of his own. About lat. $22^{\circ} 58'$ they also fell in with some fine looking natives, who said that they had seen an exploring party, but no camels. Further on the natives possessed some iron tomahawks, which they said they got from another tribe on the river to the southward. Continuing their course in a S.S.W. direction, and partly under the guidance of natives, some of whom, however, seemed disposed to be hostile, the party

on the 15th April reached a creek which they named Dunsmore, and which led them on the 17th to Cooper River. The country passed through and explored during the next four weeks in the neighbourhood of the same river was generally of an indifferent character, and towards the east the horses on more than one occasion suffered from want of water. Marks on many of the trees showed that it had been visited. On the 21st of May they reached the station of a settler on the Warigo River; and thence passed by Bumarannah on the Darling on the 2nd of June, to Menindie and Melbourne by the usual route.

3. *Explorations in the Interior of Australia by the Burke Relief Expedition, under Mr. J. M'KINLAY.*

THE South Australian Burke Relief Expedition was originally organised with the view of ascertaining the fate of, and affording relief to, that portion of the Burke expedition which perished upon Cooper Creek, after achieving the task so unsuccessfully undertaken by previous explorers. It left the South Australian capital on the 14th of August, 1861, and reached the confines of the settled districts on the 26th of the following month. On the 27th of September the party, consisting of nine whites and two natives, with twenty-four horses, four camels, twelve bullocks, one hundred sheep, and a dog, crossed Lake Torrens, and fairly commenced their arduous task. Though not at that period occupied, the country to the north of Lake Torrens had been visited by many of the settlers upon the southern margin; and one of them undertook to guide the party to the first of a series of fresh water lakes, about fifty miles in advance. It took several days to reach Lake Hope, as the heat of the weather completely knocked up the bullocks; but by the aid of the camels the expedition was extricated. During the stay of the party at the lake district, an excursion was undertaken with the view of ascertaining the truth of a report that some whites were living upon a raft in one of the creeks in the vicinity. On the banks of the creek were marks of a European encampment; the dung of camels proving that it must have been one of Burke's, while en route to or from the Gulf to Cooper Creek. The remains of one of the party, since ascertained to be Gray, and showing traces of a violent death, were found slightly covered with earth and boughs; and at a little distance two holes very like graves. A subsequent visit to Cooper Creek left but little doubt about the fate of Burke.

In the course of December the main camp moved to a double

lake, called Appocaldradille. From this point a scout was undertaken to both north and east without finding water for 50 miles. The party consequently moved on to a deep creek, called Appanbara, where, however, they endured much suffering from heat and bad water. After the first rains in February, it was thought practicable to traverse the stony desert. For some days the route lay along a creek called "Cariduro" (probably Eyre Creek of Captain Sturt), where several traces of Burke's party were found. At this period of the journey the main difficulties were due to the floods, which rise very rapidly, and render the whole country a sea either of water or of treacherous mud. Forced by the flood to continue in a north-east direction, over an undulating stony country, the expedition came at length to vast grassy plains, bounded by volcanic hills, among which were obtained some of the most striking views on the journey. On the 7th of May the party reached the gorge through which the Leichhardt flowed towards the Gulf. On the 20th the camp nearest the sea was made, at a point where the tide rose 8 or 9 feet, and where sea anemones floated past in large numbers. On the 21st the expedition commenced its return *via* Port Denison; and on the 2nd of August, after great fatigues and the loss of most of the cattle, the first station in the settled districts was reached.

The PRESIDENT said that after perusing the diaries of these explorers he was astonished at the difficulties which they had overcome, arising from the want of water for many days and the loss of their horses and camels. The results only and the favourable termination of their journeys had been placed before the Meeting. In order to appreciate the importance of their labours their diaries must be read *in extenso*. He hoped some gentlemen connected with Australia would speak to the great merit of these explorations.

SIR CHARLES NICHOLSON, Bart., said the Papers which had been read gave a very clear and accurate summary of the explorations of these adventurous travellers. He had known Mr. Landsborough for several years, and he believed among the whole of the explorers of the Australian continent he was *facile princeps*; he had known him go into the bush, accompanied by only a single native black boy, and be absent for three or four months traversing a country where no European had ever been before.

The results of Mr. Macdougall Stuart's exploration were certainly very interesting; but in awarding to him the praise which was due to his successful exertions, they ought not to forget the first and greatest of all Australian explorers, the lamented Leichhardt, who twenty years ago made an exploration from Sydney along the whole of the east coast below the Gulf of Carpentaria as far as Port Essington. It was entirely undertaken on his own private resources, assisted by a few of his friends, and it was certainly one of the most remarkable, most extensive, and most successful enterprises ever undertaken in Australia.

With reference to the district lately traversed by Mr. Stuart, north of the northern boundary of South Australia, it was not, strictly speaking, within the jurisdiction of any one of the colonies. In the mean time settlers were pressing out in that direction. Several large parties were about to start from Melbourne and Adelaide with the intention of forming a settlement in that country. It was certainly most desirable that Her Majesty's Government should take some

steps with the view to the organisation of a separate and independent colony in that region. There was every inducement to the occupation of that country. It appeared that there were large tracts of land of the finest possible description available for pasture and agriculture, and therefore capable of being immediately taken up, while on the shores of the ocean there were immense areas suitable for the growth of cotton and various tropical productions. There were rivers accessible to vessels of considerable size. With all these inducements to settlers, unless some decided action were taken by the Government, this country would become a complete *Alsatia*: people would be migrating thither from the different colonies, taking possession of tracts of land without law, order, or authority among them, and he conceived that the greatest embarrassments and difficulties would ensue in consequence.

It was urged with great propriety that the establishment of colonies ought not to be made a charge upon the Imperial funds. As an Australian colonist, he in common with all his Australian friends believed that this colony of Stuart's Land might be established and placed upon an efficient footing without one farthing expense to the Imperial Treasury. The people who were ready to go there and take up the country were prepared to pay their licences and assessments and to make purchases of land in suitable positions that might be selected for townships. In this way a large and sufficient revenue could be raised to meet the expenses of a local government.

With regard to the Victoria River, it appeared to be the largest tidal river in Australia, the tide rising in it some 30 or 40 feet. With respect to the Roper River, there must be some little discrepancy between the account given by Mr. Stuart and that given by Dr. Leichhardt. In 1844, when Leichhardt crossed all these rivers, the Flinders, the Albert, the Nicholson, and the Roper, he was able to ford the whole of them, therefore it was difficult to conceive how they could be regarded as rivers capable of receiving vessels of any great size.

MR. MARSH, M.P., also bore testimony to the great merits of Dr. Leichhardt, and then referring to the remarks of Sir Charles Nicholson, said he was afraid that gentleman was a little too sanguine about the capabilities of the interior of Australia. His own idea of the interior of Australia fluctuated between a swamp and a desert—sometimes it was one and sometimes the other, according to the seasons.

He was led to this conclusion not only from the history of the colony generally, but from his own observations. For instance, near where he lived there was a large lagoon two or three miles across: very often that lagoon was dry for two or three years together, and at other times it rose to what is known as the present high-water mark. But above that point there was another high-water mark, perhaps some eight feet higher. Between these two high-water marks were trees of very great dimensions, which would have taken forty or fifty years to grow, and which were all dead. What conclusion must be drawn from this? That between these two high-water marks there was no water for any long period between forty and fifty years; that then the water rose to such a height and remained there such a time as to kill these trees. He believed this to be the case with a great part of Australia. Being somewhat of a meteorologist, he had observed that during some seasons the wind from the north-west was always hot and dry, and at other times it would be damp and bring more or less rain. The conclusion he drew from this was that the country to the west over which Stuart and others had passed was sometimes a very wet and swampy country, and at other times perfectly dry and desert. He was, therefore, inclined to think that a great deal of this country which appeared to be very good, the people having passed it at a favourable season, would turn out to be worthless after all. Another circumstance which led to the same conclusion was that there was no elevated land there, and without elevated land there could be no regular streams and no regular supply of water. It also appeared to him,

that although this country came within the wind of the monsoon, it did not come within the rains of the monsoon; and this conclusion seemed to be confirmed by Gregory, who at 150 miles in the interior from the north-west cape of Australia put it down as desert, at the very point where the height of the monsoon ought to blow.

He might also observe that, in the papers read to them, although the explorers crossed the country at a favourable season, the general cry was "Water! water! water!" They came to fine country where their horses could feed, and yet the cry was "Water!" It therefore became a question how far this country would stand being stocked. Everybody who had been in Australia knew that when you first went on to a run and stocked it, no matter what the season was, if there was no water there was plenty of grass, because nothing had eaten it up. But when you came to stock it with 3000 or 4000 sheep, the country would not stand it; they ate up all the herbage, there was no shade for the ground, the violence of the sun and wind got into it, and rendered it more dry and arid than it was before.

MR. SAUNDERS, alluding to the remarks of a previous speaker on the influence of the monsoon upon Australian climate, said he thought it might be demonstrated that the solstitial action of the sun across the centre of Australia was the cause of the north-west monsoon. In approaching and receding from the tropic, the sun is vertical for 60 successive days within the belt of $3\frac{1}{2}$ degrees of latitude, between the parallels of 20° and the tropic. In passing from the lat. of 20° to the equator, the sun only occupies the same length of time; so that he is vertical over the $3\frac{1}{2}$ degrees next to the tropic six times longer than he is over any equal part of the remaining 40 degrees of his course. One result of the solstice is much more intense heat within latitudes subject to it than elsewhere. This was quite sufficient to account for that divergence of the ordinary course of the wind from the south-east trades to the north-west monsoon. He should like to remind the Society that there were two other names that deserved to be held in remembrance among the earlier explorers of Australia. One was that of the late Sir Thomas Mitchell, whose accounts of the country beyond the Barcoo were thought to be almost too enthusiastic to be true, but which the present concurrence of evidence proved to be within the mark. The other was Captain Stokes, who with a boat's crew succeeded in penetrating within the shores of the Gulf of Carpentaria, and unfolded those beautiful lands to which twenty years ago he gave the name of the "Plains of Promise." His language was also believed to be exaggerated; but Landsborough, M'Kinlay, and others had confirmed his description of the country in the most emphatic manner. It should be remembered, too, that Captain Stokes who discovered the Albert was also the first to explore the Victoria River. The recommendation of Sir Charles Nicholson that there should be a separate and independent administration for North Australia he held to be of the greatest importance, partly on the ground of the nature of the population which would be attracted to that region; for in all probability there would be a large Asiatic element to deal with there, demanding a system of administration unsuitable for the European population of the more southern colonies.

MR. CRAWFORD dissented from the views of Sir Charles Nicholson about the capabilities of this newly-explored region for colonization by Europeans, and more especially for the rearing of sheep. Even Mr. Stuart stated that he found the shores of the Gulf of Carpentaria a marshy country, and everybody knew that a marshy country was not fit for sheep. He once had a favourable opinion of Queensland for the growth of cotton; but he begged to renounce that opinion, for he was certain Queensland could never compete with the southern States of America. European labour would be too costly, and it was a mistake to suppose that labour could be imported from the Eastern Archipelago; for those

islands, with the exception of Java, were underpeopled, and the natives would never be got to work. With respect then to the recommendation of Sir Charles Nicholson that Government should form a new colony in North Australia, he hoped the Government would do no such thing, for no European community would be able to live and labour in a region which was within from 10° to 15° of the Equator.

MR. TORRENS said he had recently returned from travelling through the settled part of the coast line, and he therefore felt emboldened to contradict the last speaker in every respect. First, upon the point of forming a colony on the northern coast, he was persuaded, whether the English Government took the matter in hand or not, that a settlement would be founded there in a very short time. He had no doubt stock-holders would soon be on the tracks of Stuart and M'Kinlay, who had been enabled on a first exploration to take cattle and sheep up with them. Three months ago M'Kinlay told him that he took his sheep up there with the greatest ease, that they continued in excellent condition, and that he lost but one ewe on the entire journey, and this he had to leave behind because it was lambing. This was a practical refutation of the opinion of the last speaker that sheep cannot be grown on the Gulf of Carpentaria. Anybody acquainted with Australia knew that it was the first explorer who had the greatest difficulty in providing for his stock, owing to his not knowing where to find water, whereas those who followed his tracks had the advantage of his previous exploration and knew with certainty where they could hit upon water. In illustration of this, he might mention that a large region in the neighbourhood of Lake Torrens, which Mr. Eyre upon his first exploration pronounced to be worthless, was now some of the finest sheep country in South Australia, and grew very large quantities of stock.

He agreed with Sir Charles Nicholson in thinking that it was desirable for the British Government to establish a local government in North Australia. He certainly should regret to see that portion of country inhabited by an Asiatic population; and if there were high table-lands there, such as he had recently ridden over in Queensland, it would be one of the finest climates on the face of the earth for the European race.

He was fully persuaded of the truthfulness of Mr. McDonall Stuart, who described the country as having continuous ranges, and stated that only on one or two occasions had he to pass a single day without water for his horses. From his own knowledge of Australia he was certain that, if a person travelling there for the first time could say thus much, a man who had been settled in the country long enough to look around and explore the water-courses never need pass a day without water.

From the adaptability of the country for colonization, he thought a colony might be founded there without costing Great Britain a shilling, and he endorsed unhesitatingly what had been said, that the colonists of Australia did not desire one shilling to be expended in founding colonies in that part of the world. There would always be found capitalists ready to advance the first outlay upon the security of the Crown lands of the country; and upon such a system he yet hoped to see a colony founded in Northern Australia so as to prevent those disastrous consequences arising, not only to settlers but to the natives, which would certainly arise unless order and good government and British institutions were imported into that country.

MR. ALFRED WALLACE said he had never visited Australia, but he was well acquainted with some of the adjacent countries which had been alluded to in the course of the evening. He would, therefore, state a few facts, the result of his own experience, which might guide them in forming an opinion as to the availability of Northern tropical Australia for colonization. Two points had been mentioned on which he wished to offer an observation: one was that labour could

be obtained from the Indian Archipelago, and the other that sheep-farming would probably succeed in that district. With regard to the first point, he quite agreed with Mr. Crawford in saying that there was not the slightest hope of obtaining any labour from those islands. The inhabitants were exceedingly few in number and they were extremely lazy: it was impossible to make them work, even in their native islands, and they would not leave their own country to labour elsewhere, except perhaps to live on the seacoast and obtain their livelihood by fishing. The only people who could do the labour were the Chinese; but there were many difficulties connected with them which would not perhaps render the importation of the Chinese advisable. The next point was that the district which it was proposed to colonise was not only tropical but almost equatorial in its character, the Victoria River being in 15° south latitude. He did not believe they would find any country in the world within 15° of the Equator in which the European wool-bearing sheep could exist; consequently the colonists who went to that part of the country with the intention of commencing sheep-farming would be exceedingly disappointed, because even in the more favourable island of Timor, which closely resembled Australia in its physical characteristics, the sheep had no wool. Sheep brought from Australia for the purpose of experiment began to lose their wool after they had been there a year, and in a tropical climate like that they made no fat, which was the only other commodity for which sheep were valuable. Therefore if the wool turned to hair, and if the fat went away, he did not see how sheep-farming could be carried on with success.

SIR CHARLES NICHOLSON, Bart., said no such proposition had ever been made as the importation of native labour from Timor; and as to the possibility of sheep living within the tropics, he believed at this moment there were upwards of a million of sheep actually being pastured within the tropics in the highest possible condition.

MR. HOOD thought some of the gentlemen who had addressed the Meeting were very much astray with regard to the prospects of North Australia. Mr. Marsh seemed to think that the monsoon could not be depended upon in North Australia. He was quite correct, because for several years the tropical rains never reached so far south as Rockingham Bay. But that very fact made tropical Queensland more valuable as a pastoral country and capable of being inhabited by Europeans. In the tropic of Capricorn, at the river Harris, which is about 800 feet above the sea, in the month of September ice has been found two inches thick at twelve o'clock in the day. This peculiarity in the climate from the great radiation makes it exceedingly healthy for the human race, and an excellent country for sheep. This newly-discovered part of Australia promised to be valuable not only as a wool-producing country, but in many other ways. Considerable quantities of gold had been found at several points. There were also large outcrops of copper, in one instance presenting a mass 2000 yards long, 28 feet wide, and 6 feet in height. No one could well conceive the hardships and difficulties which beset first explorers, owing to the uncertainty of procuring water. Landsborough's expedition had been conducted with almost more success than any other had ever attained; but he thought the palm ought to be given to Mr. Stuart.

THE PRESIDENT said before he closed the Meeting that he was very happy indeed to find Australian gentlemen of such intelligence as Sir Charles Nicholson and Mr. Marsh testifying to the great desirability of establishing a colony upon the north coast of Australia. He was proud to think that many years ago he had advocated the establishment of a colony on the northern coast, so that Great Britain might be in possession of the four sides of that vast continent. Mr. Augustus Gregory's expedition had successfully demonstrated that sheep could flourish in that region. He took a large flock of sheep there; they

remained there eight or nine months, and no sheep died. And yet this was the country which Mr. Crawford and Mr. Wallace both said was unsuitable for sheep. Those gentlemen spoke from their experience of India and of the Eastern Archipelago; but they had forgotten the law of isothermal lines. They had forgotten that India was subtended by the ocean, which conveyed heat to lands in the latitude of Madras, while in the very same degree of latitude, south of the Equator, there were great tabular masses of land, which tempered the heat. We had in this physical fact the explanation why sheep and other animals could flourish in that latitude in Australia. The testimony of Australian gentlemen who had visited the country confirmed this fact. To return to the question of establishing a colony in North Australia, he would point out that at the mouth of the Victoria River there was the largest bay along the whole coast, capable of affording an anchorage for large fleets. He had already directed the attention of Government to the subject, for he certainly agreed with Sir Charles Nicholson and his Australian friends that it would be advisable to establish some sort of government there, inasmuch as numerous colonists would be flocking there, and, unless some authority were established, the results might be lamentable.

Ninth Meeting, March 23rd, 1863.

SIR RODERICK I. MURCHISON, K.C.B., PRESIDENT, in the Chair.

PRESENTATIONS.—*The Rev. Thomas Scott, and H. D. Skins and A. H. Barford, Esqrs., were presented upon their Election.*

ELECTIONS.—*Captain Hugh Talbot Burgoyne, R.N., V.C.; Lieutenant the Hon. John Carnegie, R.N.; Lieutenant Charles James Forbes Smith; Rev. Richard Greaves; Rev. Henry F. Tozer, M.A.; Philip Anstruther; Christopher N. Bagot; George C. Brodrick; John Henry Challis; Edward Henry Leveaux; R. Jasper Moore; and Thomas Turner, Esqrs., were elected Fellows.*

ACCESSIONS.—Vol. xxi. of the Transactions of the New York State Agricultural Society; Ordnance Map of Montenegro; Map of the Isthmus of Kraw, presented by Mr. Wise; and the 12th Part of Philip's Atlas, &c., &c.

The PRESIDENT read a letter from Mr. W. Finke, of Adelaide, announcing that the colonists are fully alive to the importance of the discoveries made by Stuart. A private company had already been organised for the transport of stock (sheep, cattle, and horses) overland to the newly-discovered country on the north coast, in Van Diemen Gulf. The party will start in April, overland; and a vessel with supplies will be sent round to meet it on the north coast.

The PRESIDENT said that he had long advocated the desirableness of having some British settlement upon that great north coast of Australia—the only coast of that vast region upon which there was no British settlement. Although a great many years ago they had marked upon the map of the Society of Useful Knowledge the colony of “North Australia,” no such colony had ever been formed; but now these spirited colonists of South Australia had been induced, by the vivid and no doubt accurate descriptions of one of their own countrymen, to set out on this expedition to establish themselves there by sending a ship round, and also by sending overland cattle and stock. He had mentioned that circumstance because he was sure from what fell from his Grace the Duke of Newcastle at their last Anniversary, that as the British colonists showed so much vigour and desire to occupy that country, the British Government would ere long apply to it those laws and institutions under which British people were placed.

The President then proceeded to state that the first paper to be read was one by Major Goldsmid, entitled ‘A March from Kurráchi to Gwadur.’ That country had hardly ever been explored by Englishmen. It was, however, well known to the ancients in the time of Alexander the Great. Major Goldsmid had been deputed to examine that line of country with a view of establishing the electric telegraph. It was the last link of communication of that great line, to the overland portions of which Sir Henry Rawlinson had called their attention at the last meeting of the session of 1861, when he pointed out the great importance of such a line from Constantinople to the British settlements in India. Major Goldsmid, in reading his paper, would allude to some curious archaeological data connected with that country, and point out how much was known of it in times somewhat remote. Colonel Patrick Stuart, under whose direction the whole of that great and important line of electric telegraphic communication had been carried out, was present, and they should be very happy to hear some account of it from an officer who was so much distinguished in India, and of such immense service during the mutiny, in which he, in fact, subserved all the great purposes of their commanders, and without whose aid their successes might never have been obtained. Having also Sir Henry Rawlinson present, they would have such a discussion on the paper as would show its great importance.

The Papers read were—

1. *Exploration from Kurráchi to Gwadur, along the Mekran Coast.* By
Major F. GOLDSMID, F.R.G.S.

THE Expedition, of which the following is a report, was sent to survey a route near the coast of Mekran, from Kurráchi to Gwadur, with a view to a line of telegraph to be thence carried on through the territory of the Imám of Muskat, and finally either through Persia or by the valley of the Tigris to Constantinople and Europe. The journey was made between December 12, 1861, and January 29, 1862.

The country bordering on this coast, and included between 62° and 67° E. long., may aptly be described as a bare and cheerless desert, occasionally intersected by low hills, with a scanty and purely periodic supply of water.

The entire route may be conveniently divided into four parts :—

	Miles.
(1.) From Kurráchi to Sonmeani	45½
(2.) „ Sonmeani to Hormara	172½
(3.) „ Hormara to Pusinf	91½
(4.) „ Pusinf to Gwadur	80½
Total	389½

1. The road to Sonmeani, though difficult in some places, is in dry weather passable for all loaded beasts. Water is obtainable, and indeed plentiful, at all the halting-places for small parties; other supplies must be brought from Kurráchi.

2. The road presents many difficulties to travellers from its circuitous length; the necessity for carrying all supplies from Sonmeani, the uncertainty of obtaining water at some of the halting-places, and the extremely rugged nature of the path, especially between Hingor and Hormara.

3. The road from Hormara to Pusinf is at no place very difficult, though by no means through a level country. It is true the country about the Kalmat River is an extensive plain, but during rainy weather this becomes impassable, and it is consequently safer to proceed by the base of the Tullar Hills.

4. There is but one journey in which any difficulty may be experienced between Pusinf and Gwadur, that of the Kurwat. The hills, through which its course lies, are of salt mud, intermingled with flaky strata of sandstone and gypsum. Their altitude is not great nor their slopes sudden, consequently for telegraphic purposes no insurmountable obstacles need be anticipated.

Great antiquarian interest attaches to the whole line of coast from Kurráchi to Bushire, and further westward. Names to be found in Arrian, Strabo, and Ptolemy, remain to the present day with little change. Of these may especially be cited Malan and Kalmut. Gwadur is supposed to mark the site of the Alam Bater of Ptolemy. The first mention of the place to be found in later years is in the Commentaries of Albuquerque. That conqueror, when at Ormuz, was requested by the Ambassador of Eumuel to assist the Persian Government to recover "Guardara" from a rebellious vassal who held it by force.

The PRESIDENT was happy to find that not the least important portion of this valuable communication was comprised in the last two pages, which contained the correction to a great extent of the physical geography in the course of the rivers, their names and their relative positions; thus making it a strictly geographical communication.

SIR HENRY RAWLINSON said, the paper was interesting in two different

points of view—firstly, with regard to its own geographical merits; and secondly, as giving some actual and tangible information on a considerable portion of the great line of the overland telegraph, of which previously they knew nothing. Major Goldsmid had truly said that this was almost a *terra incognita* before. Mr. M'Leod, he believed, was the only Englishman who had ever penetrated the country, and his observations upon it had never been published. Two years ago, when collecting statistical details with regard to the itinerary of the line, he found the greatest difficulty in getting any information regarding this particular portion, and was, in fact, obliged to rely on the reports of a native agent, who zigzagged about the country between Scinde and Gwadur in different lines, and whose reports were published in the 'Asiatic Journal,' at Bengal; but the reports were so very full of typographical errors, and altogether written in so confused a manner, that it was impossible to derive from them any real information as to the geography of the country. All this had been satisfactorily got over by the labours of Major Goldsmid. He had advanced into a country which before was unknown, and which in all the maps they found almost a blank. He had shown that it was perfectly practicable for a telegraph; and more than that, that the actual preparations for such a telegraph were now being made. The second point of interest referred to the question of telegraphic communication between England and India; and although on a previous occasion he had the honour of explaining in some detail the course of such a line, still, as a considerable period had elapsed since that time—nearly two years—a good deal of it would have fallen out of their recollection. They would see on the map a red line drawn from Constantinople showing the proposed line of telegraph as far as Kurráchi. He did not know whether the public were aware, or whether the Meeting was aware, that over nearly one-half of this line—over a very considerable portion of it at any rate—the telegraphic wire had been in actual working-order for nearly two years. He saw before him a gentleman who had a partner in Bagdad, the city of the Caliphs, and who conversed daily or weekly with him by telegraph. That was an actual proof of what could be done. The distance from London to Bagdad was greater than from Bagdad to Kurráchi. The portion they had heard described was being now laid down, and there thus remained only to fill up the gap from Gwadur to Bagdad, concerning which he hoped to hear some particulars from Colonel Patrick Stuart, who was entrusted with constructing the line. An alternative line was also under consideration. It was well known to all practical people as a point of the greatest possible importance to have alternative lines, in order that, if one broke down, there should be no interruption of communication. It was only after telegraphic communication was once established that its full value was recognised; and if telegraphic communication were thus once established with India, and all the mercantile transactions between the two countries depended on one line, it might be understood what excessive loss, disappointment, vexation, and, he might say, ruin there would be if any sudden interruption occurred. He therefore believed that the public generally would be inclined to support the Government in dealing with an alternative line, and endeavouring to provide against the possible stoppage of communication when once established. The general line now under discussion was to run from Constantinople through the Turkish empire to Bagdad, and thence to Kurráchi. As far as Bagdad it was in working order; but between Bagdad and the Persian Gulf there was a line of country which was peculiarly difficult, not to the engineer, but politically, because it was in the hands of certain Arab tribes, who were perhaps the most unruly and troublesome people in all Western Asia. Those tribes were never quiet for two years together; and if the work depended on the Turkish Government alone, the line could never be carried through the country. He believed, however, that the Turkish Government would be content to leave arrange-

ments, in a measure, in English hands; and there was thus a hope that the Arabs would, as they had often done before, fall in with our views, and perhaps help, not only in laying down the line, but in preserving it, on receiving a certain payment for their services. That, however, was not a certainty. He had no doubt the line would be laid; but whether it could be preserved intact was a matter of doubt. The shores of the Persian Gulf presented another difficulty. The most convenient point for carrying the line would be the mouth of the Euphrates; but that locality was excessively unhealthy, and the maintenance of a permanent European establishment there was almost impossible. They might, however, have European attendants during the healthy months, and then natives might be left in charge. Beyond this point the line was to be submarine; and at present their experience of submarine lines was far from satisfactory. Improvements, however, were being made daily, and it was hoped, by superior methods of insulation, to arrive at some certainty of result; but at present, as they all knew, submarine lines were liable to constant interruption. He was moreover given to understand that when the submarine line was once established, there would be no occasion for any intermediate station—that it would not indeed be necessary that the lines should be laid down in small divisions, and that any political embarrassment arising therefrom would be thus avoided. It would be quite possible to send messages from the marine terminus at the mouth of the Persian Gulf to Bunder Abbas, if not to Gwadur itself. At the mouth of the Persian Gulf there was certainly to be a repeating station. In order to provide against accidents, they were also considering an alternative line, which, in his former paper, he took to be the main line, thinking the other would be found to be absolutely impossible. The alternative line made a considerable angle if continued from Bagdad; but they must remember that distance was of no great consequence in telegraphic communication, as far as time was concerned; its only disadvantage being the additional expense for wires and material. It was proposed then to run the alternative line from Bagdad to Teheran, and thence southwards to Bushire. It had been intended at one time to extend it down to the mouth of the Persian Gulf; but that part of the country was now found to be impracticable: consequently the line would run merely to Bushire; and it was still his impression that ultimately this communication through Persia would be found to be the line upon which the greatest dependence was to be placed. Its only disadvantage was its being in the hands of a foreign country, and thus liable to political dislocation; but so long as matters remained *statu quo*, messages could be sent with perfect safety. He would only remind them, in conclusion, of the real importance of the work. They had been talking about telegraphic communication with India for many years past, and yet year went on after year and nothing was done. In the mean time the Russians were running their line right through Asia, and had approached nearly to the Chinese frontier: their line from St. Petersburg indeed would in a very short time extend to the mouth of the Amúr and to Peking. It seemed strange that Russia should be thus able to carry her lines to this vast extent with comparatively little object in view, and that the mighty empire of England, with her great Indian dependency, which had been often said to be the brightest gem in her crown, should not be able to accomplish a telegraphic line between the two countries. He congratulated the Meeting in particular, and the country in general, that preparations were at last being made for the construction of the line, and also that its formation was entrusted to so thoroughly competent an officer as Colonel Stuart.

COLONEL PATRICK STUART said, the first real physical difficulty of the line commenced at Hinglaj, and it was still doubtful whether a land line could be practically constructed there, and kept up in a way that would be reliable as an unsupported link in such an important chain of communication as that

between India and Europe. That contingency had been provided for to a certain extent, because the tract of country that really offered those difficulties was not more than 16 to 18 miles in length. There was a bold headland of from 1400 to 1600 feet in height, which he visited last year, overhanging the sea; and between it and the sea it was impossible to carry the line. The cliffs, from their sandy formation, were continually falling down in loose lumps which would destroy any line that might be carried along the surface below. A submarine cable 20 miles in length, coated with india rubber, was sent out some months ago, which would, if the difficulty of carrying the line inland continued to be the same, be laid under water along that part of the coast. Sir Henry Rawlinson had mentioned as a wonder that the Russians were able to carry out their lines so quickly. The fact was the whole country was their own; they had to ask no permission. We had been able to commence, and to set to work; and if there had been no political difficulties, it would have been done long ago. These difficulties could not in every case be got over; but it so happened along the whole of that coast the conditions generally were more favourable for a submarine cable than, with the one exception of temperature, any known coast in the world. The sole objection might be that the depths were a little too small. In the Persian Gulf they had a depth rarely exceeding 50 fathoms, and the average depth along the line was from 25, 30, to 38 fathoms. With regard to the cable proposed to be laid between Gwadar and the mouth of the Gulf the difficulties were a little greater, because at a distance of from 8, 10, 20, or 25 miles from the coast the bottom, although uniformly of soft sand, increased very rapidly in depth, and the cable would have to be laid rather tortuously in order to keep it within the depths selected as necessary. If the Persian line could not soon be completed, it was proposed to have a terminus near the mouth of the Euphrates, and at a point to which river steamers could always have access; and it was hoped that by this means we might be brought within two days' communication of India. Even if the Arab tribes could not be conciliated, communication would be delayed only by the time the steamer would take to run from Bagdad down the Tigris. It was always recognised as a most important thing to diminish, as far as possible, the temptation that the stores offered to pillagers. Partly with that view, and also to prevent oxidization, the wire was covered with zinc. This the Arabs were unable to weld, or to use for tying up bundles, on account of its thickness. It had another advantage; being the only metal in that country that was galvanized, it could always be recognised if stolen. If all went on well, long before this time next year the whole line throughout, including the part from Bagdad down to Lower Mesopotamia, would be completed, and the duplicate line through Persia in a few months later.

CAPTAIN CHAMPNEYS said he had travelled with Colonel Stuart from Bushire to Shiraz, and thence to Teheran, and along that line they met with no difficulties of any description. The necessary arrangements were now being made with the Persian Government to carry out the line.

The second Paper read was—

2. *On the Harbour of Sedashagur; and Remarks on the Sea Ports of India.*

By Inspector. DUNCAN MACPHERSON, M.D., F.R.G.S.

BEGINNING at Calcutta, we find the East India Irrigation Company engaged in great works from the Ganges to the Mahanuddy, near Cuttack, a river already navigable for small craft near its mouth.

Further south, at Coringa, the mouth of the Godavery has been so far improved, that ships of large burden can now advance into the centre of this district, from whence a network of navigable canals already communicate with the middle Godavery; beyond this, works of magnitude are in progress to render the upper stream available for steamers, which will run to the great cotton-fields upwards of 600 miles from the sea.

Proceeding down the coast to Nellore, we find the Madras Irrigation Company bringing to rapid completion a grand system of similar channels from the Kistna River at Bellary, to pierce the great cotton and indigo fields of that and the adjoining districts of Kurnul, &c., in order to communicate with the sea at the mouth of the Penar River, adjoining the populous town of Nellore; while at the Presidency City of Madras, the terminus of a railway completed for 400 miles to the west, with ramifying branches to the north and east, a pier now spans the furious surf, alongside of which ships' boats land and embark passengers and goods.

Some 200 miles further south, at Negapatam and Tutecoreen, the Trichinopoly Railway brings down the produce from the rich Delta of Tanjore.

The removal of the obstructions which impede the navigation of the Paunbaum channel still engages the efforts of Government.

At Cochin, which possesses natural inland water communications for many miles, ships of 1000 tons have been built; and the operations of an ordinary dredge on the bar at the mouth of the river would enable ships of that burden to proceed at all seasons to discharge their cargoes on the banks.

The western terminus of the Madras Railway at Beypur—a spot at all times of insignificant value, without population or trade, and unapproachable from sea by even coast craft, on account of the surf—has attained some importance as the entrepôt for the produce conveyed by it from the rich district of Coimbatour. But the position, as an outlet for the rapidly accumulating produce of that coast, can never be of commercial value, owing to the insurmountable obstacles of the sea. The line must be prolonged to the north, some 300 miles to the noble harbour of Sedashagur, receiving in its progress the extensive trade and passenger traffic from several populous native towns, and from the numerous estates which are parallel with the coast into the interior, extending to and embracing the entire Neilgherry range, the Upper and Lower Wynaad, the Principality of Coorg, the Munserabad districts, North and South Canara; also scores of others on the Mysore Plateau, all in the possession of European colonists, engaged in the cultivation of cocoanut, coffee, tea, spices, cinchona, &c.

It will be observed by the chart, that when the projected improvements in the harbour are completed, there will be a space of upwards of 21,000 acres available for anchorage, in a varying depth, reaching close in shore from 18 to 30 feet. The rocks and headlands on the coast are of lateritic formation—an excellent material for buildings; for it can be cut out soft from the mass into any shape, but speedily hardens on being exposed to the atmosphere. Granite exists in quantities as one approaches the mountains, and iron ore in masses on the left bank of the stream.

Carwar Head rises 700 feet above marine level. It is visible 25 miles from shore, and projects about a mile into the sea—the solitary headland on the coast from Bombay to Calcutta. It is to Carwar Head that this great bay is due. Even without the aid of the proposed pier, it secures a good anchorage during the south-west monsoon, while the islands give protection when the north-east winds prevail.

As a climate, Sedashagur is one of the few localities in India where cholera has been hitherto unknown. The projecting headland, with the sea on each side, makes the spot a perfect sea-coast sanitarium; and the neighbouring mountains, which rise some 3000 feet above the sea-level, offer a convenient place of resort for those who desire a residence in a more bracing climate than the sea-coast affords.

The PRESIDENT observed, Dr. Macpherson was a distinguished medical officer attached to the Indian service, who had travelled very largely over Eastern countries, and who was well known for his services in the Crimea and his description of the antiquities of Kertch; and they must thank him for his brief but very clear and valuable notice. He should be happy to hear the observations of any gentlemen present on the subject.

MR. MARKHAM said, the paper had brought to the notice of the Society the only port on the west coast of India that afforded safe anchorage during the south-west monsoon. Along the whole of that coast, from Bombay harbour to Cape Comorin, there was a tremendous surf, and trade was entirely at a standstill during the rainy season, from May to September. To those circumstances the importance of Sedashagur harbour was due. The Bombay Government was now fully alive to its advantages. A wall 300 feet long was already completed on the east side of the Beitkool cove. Within a radius of 200 miles from Sedashagur there were rich cotton-producing districts, having 980,000 acres of cotton under cultivation, for which it was the only port. Its importance, as being the only port on that coast, with the exception of Bombay, that was open during every month of the year, could scarcely be over-estimated; the only matter for surprise was that it had not before been made available. He regretted that Lieutenant Taylor was not present, as to him the chief credit was due of having brought to notice the importance of the harbour of Sedashagur.

MR. FENWICK said there was a large and very valuable tract of country immediately in the rear of Sedashagur—the southern Mahratta country—the only country in India where New Orleans cotton had yet been produced in marketable quantities. That cotton, owing to want of communication,

took generally eight, ten, or twelve months to reach England, the country being closed during the four rainy months. The attention of Government had been directed to the coast to discover a port from which the produce might be shipped during those months, and Sedashagur was the port chosen. Another drawback was the want of good roads between the port and the southern Mahratta country. Government was now constructing roads, but the works had been suspended owing to the prevalence of fever in that district. It was a very curious fact that fever had been more prevalent during the last two years—since a stop had been put by the Government to forest-burning and the destruction of the jungle. He believed the true value of Sedashagur as a port would not be fully brought out until a railway was opened between it and these southern districts, because the most important produce of that country (the cotton) was not ready to be sent down to the coast till very late in April, by which time the rainy season had set in, and the cotton was liable to serious damage.

The PRESIDENT said he had only one observation to make as a geologist, which was, that the rock formation alluded to afforded great facilities for the construction of the necessary works in the harbour. It was one of the younger formations—the youngest certainly in that part of India—and the facility with which it could be extracted, and the manner in which it hardened under the atmosphere, were much in favour of all the works to be carried out in the harbour. The observations that had been made with regard to the railway were very important. He hoped Government would consider the circumstances, and forward such an undertaking with the same liberality with which they had established railways in other parts of India.

Tenth Meeting, Monday, April 13th, 1863.

SIR RODERICK I. MURCHISON, K.C.B., PRESIDENT, in the Chair.

PRESENTATION.—*The Rev. R. W. Greaves was presented upon his Election.*

ELECTIONS.—*Colonel the Hon. St. George Foley, C.B.; George Elder; John Fisher; J. H. Gladstone; Charles Mouhot; and Thomas Ogilvy, Esqrs., were elected Fellows.*

ACCESSIONS.—Among the donations to the Library and Map-rooms since the former Meeting were—Transactions of the Linnean Society, Vol. xxiii., Part 3, and Vol. xxiv., Part 1; the 13th Part of Philip's Atlas; Admiralty Charts, Ordnance Maps, &c.

The PRESIDENT said he was sure that all who had been in the habit of attending the meetings must be well acquainted with the name of Henry Grinnell, of New York. He was a most remarkable man. An American merchant imbued with a strong spirit of philanthropy, and with a love and admiration for those of our countrymen who had explored the Arctic regions, he had spared no expense in fitting out expeditions to search for the relics of the lamented Franklin. He was assured by Captain Sherard Osborn that Mr. Grinnell had spent between 20,000*l.* and 30,000*l.* on this object alone. These were deeds which could never be forgotten, and it was mainly through his instru-

mentality that Mr. Hall, from Ohio, had been assisted in his adventurous enterprise in search of traces of the lost expedition. Mr. Hall went out in a whaler that touched only at parts of the coast very remote from where poor Franklin was lost. He then endeavoured in a little boat to reach that distant region; he, however, lost his boat, and was obliged to confine his explorations to the district in which he was embayed for two winters. During this long interval Mr. Hall made himself acquainted with the language of the Esquimaux; and obtained from the curious traditions which they had long preserved among them—handed down from mother to daughter—information respecting the Frobisher expedition, undertaken in the reign of Queen Elizabeth. Mr. Hall had brought home some relics of that expedition; and he had, moreover, discovered that what was marked on all maps as Frobisher Strait, is in reality a bay.

The first Paper read was—

1. *Frobisher Strait proved to be a Bay, and on the Fate of Five Men of the Arctic Expedition in the reign of Elizabeth.* By MR. C. F. HALL, of Ohio; communicated by HENRY GRINNELL, Esq., F.R.G.S., of New York.

THE object of the Expedition undertaken by Mr. Hall was to make further search for traces of the Franklin party. In this he was supported and assisted by Mr. Henry Grinnell and other friends, and he besides received a free passage in a ship belonging to Messrs. Williams and Haven, of New London. He sailed on the 29th May, 1860, and on the 17th August reached a harbour on the west side of Davis Strait, a little north of "Frobisher Strait." Here he wintered among the Esquimaux, adopting their dress and habits, and learning their language. In the following spring, although he found it impracticable to reach King William Land for the original purpose of his voyage, he made an expedition of 48 days to the north with some natives, living at night in snow huts erected by the party. Obtaining the loan of a whale-boat, he then explored "Frobisher Strait," and after an excursion of 50 days satisfied himself that the so-called Strait was really a bay. He was detained in these regions another winter by the sudden setting in of ice, which imprisoned the ship in which he intended to return. In April and May, 1862, he made a sledge journey over a great portion of his previous year's route; and visiting the Countess of Warwick's Isle, he collected a number of relics, which he supposes to be those of the lost members of Frobisher's Expedition in 1576.

His supposition is founded partly on an identity of locality, and partly on a tradition among the Esquimaux, that very long ago some ships landed a party of white people; two ships are said to have come in one year, two or three in the next, and very many in the following. The natives spoke also of pieces of very heavy stone of a black colour, which he supposes to be iron, and other

relics, to be found on the island in question. The relics consisted of pieces of iron, of coal, fragments of pottery, ruins of a house containing mortar; and many of them were exhibited at the meeting.

The PRESIDENT, having said that the adventurous gentleman who had communicated this memoir was entitled to their warmest thanks, alluded to several naval officers present who had distinguished themselves in Arctic explorations, and first called upon Sir George Back, who, as an associate of Franklin in one of his earlier expeditions, was very nearly wrecked off the southern point of the tract under consideration, which separates Baffin Bay from Hudson Strait.

ADMIRAL SIR GEORGE BACK said he could give very little information respecting the subject of the Paper, for he had not been nearer to the spot in question than Resolution Island, south of Frobisher Bay. On that occasion—so long ago as 1819—in company with his old and dear friend the late Sir John Franklin, the ship, belonging to the Hudson Bay Company, coming in with a fair wind was suddenly becalmed close in under the almost perpendicular walls of Resolution Island. There appeared very little hope of the ship being saved, but a most extraordinary circumstance occurred. The ship, hove up by the swell, struck upon a rock, which unhung the rudder to a certain extent, so as to make it useless. In that way the ship remained some six or eight minutes, when another upheaving of the sea again ran the ship on the rock, and re-hung the rudder. At the same moment a breath of wind off shore filled the sails, glanced her head off, and so she escaped. The ship crossed Hudson Bay, and arrived safely at York Factory, a possession of the Hudson Bay Company. When she was unladen and placed on shore, to the surprise of everybody they found a huge rock of many tons weight fixed in the bottom of the ship. Had that by any chance slipped out in the midst of the bay, the vessel would have sunk instantly.

To return to the Paper, which was a very interesting one indeed, geographers were particularly indebted to Mr. Hall for having corrected a geographical misnomer. Yet, so far as he remembered, at the time when it was called Frobisher Strait a discussion was raised as to the term; and at a subsequent period the celebrated geographer Dalrymple endeavoured to prove that it could not be a strait, but a bay, though probably from a feeling of respect towards the gallant Frobisher, his name remained affixed to it as a strait. There is nothing more perplexing to explorers on entering a piece of water than to know whether they are in a strait or in a bay, from the land-locked appearance presented by islands. An instance of the kind occurred in 1818, when a distinguished naval officer went to Baffin Bay, and described what was then known as Lancaster Sound to be a bay, and certain mountains which appeared to stand at the end of the bay he named after the well-known Secretary of the Admiralty—John Wilson Croker. The following year the error was discovered by Sir Edward Parry, who sailed past these supposed mountains, and arrived at Melville Island, where he was stopped by the ice. To adopt the words of Sir John Barrow, the fountain-head of modern Arctic discovery, the mountains which were named after one Secretary of the Admiralty were sailed past and were proved to be the straits named after another Secretary of the Admiralty.

We were therefore greatly indebted to the gallant American for having determined the character of the so-called Frobisher Strait. He had achieved most of the journey of fifty-one days in a sledge, and the rest he had performed in a canoe or boat; therefore he had in reality gone round the whole of that bay, and had satisfactorily settled the point that it was a bay, and not a strait.

CAPTAIN SHEPARD OSBORN, R.N., said he cordially agreed with the President that we, as Englishmen, were greatly indebted to that distinguished American,

Henry Grinnell, for his cordial and kind support in the endeavours that had been made to discover traces of Franklin and his party. Not only was his heart in the object, but he had employed his means in sending forth expedition after expedition into the Arctic regions; and with an enthusiasm which was honourable alike to the cause and to his country; he was ever ready to back up any effort made either by Englishmen or by his own countrymen. That had been the case with Mr. Hall. Assisted by Mr. Grinnell he went forth to find Franklin, and he said he had found Frobisher instead.

While giving every credit to this gentleman for what he had done, his geographical discoveries were to a certain extent qualified. Looking at the question in a geographical point of view, he might state that eleven years ago, while in the Arctic regions, he was assured by whalers that every one of these sounds were bays. One of the best of them was William Penny, an Englishman, who had fished up to the head of most of them. He was asked why he did not make this truth known. His answer was a good, practical, commercial one; he said, "My knowledge is money." Therefore to Mr. Hall was due the credit, as a geographer, of having made the fact known with respect to the so-called Frobisher Strait, provided he produced latitudes and longitudes. With respect to the discovery of coal on Warwick Island, it struck him that the whole question pivoted on that one fact. Now, it might not be known that on the west side of Davis Strait, from Cape Walsingham downwards, and at many other points, coal is to be found; it abounds near Disco. Mr. Hall would find this circumstance mentioned in the account of Sir John Ross's first expedition, when Parry was one of his lieutenants, and when he was returning down the west side of the strait from that very expedition to which Sir George Back had alluded. It should also be remembered that these early navigators merely found the entrances of these pieces of water, and, as would be seen by reference to a volume published by the Hakluyt Society, they merely marked the headlands in their charts; and it was not until two hundred years afterwards that geographers were pleased of their own accord to call one piece of water a bay, another a strait, and another a sound. Therefore while giving full credit to Mr. Hall for his discoveries, it should not be forgotten that these early navigators are not responsible for the names given to their discoveries.

The PRESIDENT said, as much of the value of the Paper depended upon the evidence of the Esquimaux, he should next call upon the Rev. Peter Latrobe, whose family from the time of his grandfather had been distinguished in missionary exertions, and who was himself connected with the missions to the coast of Labrador, and intimately acquainted with the habits and customs of the natives and the value to be attached to their testimony. He had laid on the table various curious rock specimens from Labrador, including one very peculiar mineral which had been named after himself, Latrobite.

The REV. P. LATROBE then gave a brief sketch of the progress and results of the Moravian mission on the coasts of Labrador and Greenland. He pointed out some of the physical features of the two countries, and the great difference in their respective climates. Greenland was far to the north of Labrador, yet the climate was milder. In Labrador the thermometer often falls during winter to 30° and 40° below zero of Fahrenheit, whereas in Greenland such extreme cold was never known. The inhabitants closely resembled each other, and spoke dialects of the same language, as was shown by Captain Washington, in his interesting vocabulary of the Esquimaux language. To those who wished well to the race, it was painful to observe that they were degenerating. They were becoming better informed, they were becoming more Christianised, their habits were improving in many respects, but they were not equal to their forefathers in point of endurance. This was partly because they had a great tendency to adopt the habits, and especially the food, of Europeans. It is found that train-

oil and blubber suit the Esquimaux constitution far better than coffee and tea, and that as long as they can get that congenial nourishment they are able to endure any amount of cold and hunger or hardship; but as soon as they endeavour to live as Europeans their constitutions begin to get enfeebled. They and their dogs are subject to severe epidemics. As illustrations of the progress of civilization among the Esquimaux, the Rev. gentleman produced copies of Testaments, Prayer-books, and hymns, printed in the Esquimaux language, and stated that the people were very fond of music, possessed good voices, and had excellent memories. They were also very good draughtsmen, in proof of which he had in his possession a chart of 100 miles of the coast, the work of a native; and they also wrote very well. He had with him a very curious book, mainly the production of a Greenlander, illustrated with woodcuts, containing an account of a tradition handed down from generation to generation, in reference to an invasion of Greenland by the Scandinavians six or seven centuries ago. It was known that the Scandinavians formed settlements, built churches and houses, and that after some centuries they disappeared. This book professed to give an account of this incursion of the Scandinavians, of the disputes and wars that took place in consequence, and of the final extermination of the invaders. In conclusion, he stated that Labrador produced a beautiful kind of spar, also hornblende, anthracite, granite, porphyry, jade, serpentine, and other minerals.

The PRESIDENT reminded the Meeting that before Mr. Hall went to examine the so-called Frobisher Strait, he was told by the Esquimaux that it was a bay. It was quite clear, therefore, that the natives were not bad geographers, and were acquainted with the coast-line of their country. He had now to call upon Dr. Rae, who was the first to bring to this country certain very important relics of the Franklin expedition, to read a Paper upon the countries of the Red River and the Saskatchewan.

DR. RAE said he wished to make a remark upon the Paper of Mr. Hall. He fully concurred in all he had said as to the truthfulness of the Esquimaux. When he first brought home information he had gained from them, they were called liars and story-tellers. He knew better. He never in his life found an Esquimaux tell a falsehood unless it was to gain some particular object; and when they did tell a falsehood, it could easily be detected by a little cross-questioning. Where they had nothing to gain by suppressing the truth, you could fully rely upon their statements.

The second Paper read was—

2. *A Visit to Red River and the Saskatchewan.* By Dr. JOHN RAE, M.D.,
F.R.G.S.

DR. RAE's Paper briefly described a hunting excursion to the prairies of the Saskatchewan River, undertaken by two young English gentlemen, whom he accompanied, and during which he established the latitudes of several points on the route, and rectified the positions of other places. He described two lakes of considerable size (both salt), situated among the elevations of the "Coteau du Prairie," which had not previously been placed on the maps. He named them the "Chaplin" and "Johnstone" lakes. He explained what he believed would be the chief difficulties to be met with in colonising the Valley of the Saskatchewan, and in the formation of an

overland route through it, from the Atlantic to the Pacific. He also gave an estimate of the probable time that would be occupied and the expenses incurred in travelling by this route, as compared with the voyage from England to Vancouver Island *via* Panama—viz., 43l. and 51 days against 33l. and 37 days, or 10l. and 4 days in favour of the Panama route.

The PRESIDENT congratulated the Society upon the fact that Dr. Rae, while accompanying two or three gentlemen on a buffalo shooting excursion, had fixed, by astronomical observations, the latitude and longitude of places which were before very imperfectly laid down on the maps. They were therefore much indebted to Dr. Rae for his communication.

The Meeting was then adjourned to April 27th.

Eleventh Meeting, Monday Evening, April 27th, 1863.

SIR RODERICK I. MURCHISON, K.C.B., PRESIDENT, in the Chair.

ELECTIONS.—*Lieut.-Colonel John Charles Downie Morrison; William Hatfield; Henry Pevenil Le Mesurier; George Loch; Henry Salt; and Cromwell Flestwood Varley, Esqrs., were elected Fellows.*

ACCESSIONS.—Among the donations to the Library and Map-Rooms since the former Meeting were—Holmes's 'Magneto-electric Light applicable to Lighthouses;' Pugh's 'Queensland Almanack' for 1862; Map of the Mekran Coast, from Kurráchi to the Persian Gulf; and continuations of Admiralty Charts and Ordnance Maps.

EXHIBITION.—M'Leod's 'Geological Map of England and Wales.'

THE PRESIDENT said he had received a letter from Mr. Tinné, in reference to the explorations of the Dutch and English ladies, his relatives, up the White Nile, which he would read.

"Being unable to attend your next Meeting, I have much pleasure in giving you, as requested, some further information regarding my lady relatives, of whose return from Gondokoro to Khartûm on the 20th of November last you have already been apprised.

"Their last letter is to the 5th of February, at which date they had started on a fresh expedition up the White Nile, but were stopped, about three hours' sail from Khartûm, by an accident which happened to one of their boats and threatened to swamp her. This was caused by the captain and the pilot, who, on being examined, were made to own that they had bored a hole in the bottom, being unwilling to go up the White Nile.

"The damage having been repaired, and a new crew engaged, they were on the point of proceeding on their voyage again.

"One of the ladies remained at Khartûm, and Madame Tinné and her daughter were accompanied by Mr. D'Ablaing, a Dutch gentleman, who had come across from Abyssinia; by Mr. Heuglin, whose communications from Africa are known to the Royal Geographical Society; and by another German gentleman (whose name I am not yet acquainted with), a medical

man and naturalist, who also draws beautifully; so that, as Madame Tinné remarks, 'they hope to make a more scientific, if not a more agreeable, journey than the last.'

"The health of the party that had been at Gondokoro, some of whom had suffered from fever, was entirely restored during their prolonged stay of two months and a half at Khartûm, and all were in excellent spirits. The weather had been cool, rather stormy at times, but agreeable and bracing, and the sky bright and blue.

"Their present expedition is on a larger scale than the former one. They have the steamer and five boats, with 168 people to provide for (50 of whom are additional soldiers), besides 4 camels, 30 mules and donkeys, and 3 horses. The boats had been repaired and refitted with new sails, and they had laid in guns, ammunition, new tents, and ample stores of all kinds. Further on, nothing of that description could be got, and everything therefore had to be procured beforehand.

"The Dutch gentleman intended to proceed up the Nile, and Madame Tinné and her daughter were to turn off at Bahr-el-Gazal. At some point of this river they would find the rest of their party, who had gone on in advance. Disembarking there, they proposed leaving their boats and commencing a land journey into the interior,—to use Madame Tinné's own words, 'into unknown parts.'

"She mentions Mr. Baker having started, and also speaks of the rumour about Mr. Petherick's disappearance, but nothing more decided than we have heard previously as to his fate."

For this communication from Mr. Tinné the President begged the Fellows to return their best thanks, for he was sure there were few persons more entitled to be honorary members of the Royal Geographical Society than those adventurous ladies.

The Papers read were—

1. *Exploration of the Elephant Mountain in the Batonga Country, West Africa.* By Capt. R. F. BURTON, H.M. Consul for the Bight of Biafra and Fernando Po.

CAPT. BURTON visited Batonga Bay in September, 1862, about the commencement of the second rainy season of the year. The bay is a mere roadstead, and the ship (H.M.S. *Bloodhound*) lay 1½ mile from the land. A heavy surf breaks on the whole coast from the Cameroons River to Corisco Island; and landing is almost exclusively effected in light native canoes. The shore shows a long line of densely-wooded lowland, based upon yellow sand. Inland are seen groups of low hills, conjectured to be the spurs of the Sierra del Crystal. This range, never yet crossed by any European, seems to form a line of Ghauts similar to those in Eastern Africa, at about 100 or 150 miles from the coast. The most remarkable among the intermediate hills is the "Elephant Mountain," so called from its resemblance to an elephant couchant. There are two or three factories belonging to European merchants in the bay, but none of the residents appear to have ever penetrated a mile of the interior. Although the country is rich, there is no trade but ivory;

and this comes from a distance, as no elephants are found within four days' march of the coast. The Elobe River pours itself into the bay by a low cataract, above which the party obtained a view of the stream, without however succeeding in obtaining any information about its upper course or its source.

On the 14th September Capt. Burton landed with Lieut. Stokes to explore the Elephant Mountain. After considerable difficulty with the chiefs on the coast, who, as usual, were unwilling that any traveller should pass beyond their own territories, the party started the following day. The path, a narrow line, led them first past some villages of bushmen, and then through an undulating country, densely wooded with a profuse variety of vegetation. Water was abundant in clear running streams, but game nowhere to be seen. The first day's march, which was much delayed by palavers at the villages, and at the ferry across the Elobe, was about 7 miles.

Leaving Labele, their night's halting-place, the next morning the party crossed a deep hollow, and began the ascent of the mountain from the south-east. The path, at first easy, soon became steep and slippery, and the wood grew thinner; and after three hours' march the summit was reached. The elevation was found by B.P. thermometer to be 1707 feet, agreeing with the trigonometrical measurement given in the chart. The party descended by a still more difficult path on the western side, and returned to the coast on the 17th.

2. *Narrative of a Journey to Odé, the Capital of the Ijebu Country, in January, 1862.* By Capt. BEDINGFELD, R.N.

THE object of the Expedition which visited Abeokuta, Porto Nuovo, and Odé, after the cession of Lagos, was to conciliate and explain to the chiefs our views in forming the colony, and to induce them to put a stop to the petty wars, and to open their roads to legitimate commerce.

The Ijebus had never before been visited by any white man, except Mr. Champneys, a Wesleyan missionary. The present party was received in a most friendly manner, and the visit was in every way satisfactory. They were much struck with the beauty of the country, the amount of cultivation, and the industry of various kinds shown by the natives. One large village contained a great number of blacksmiths, occupied in manufacturing hoes.

Captain Bedingfeld, accompanied by Lieut. Dolbin, of the *Prometheus*, and an interpreter, left Lagos on the 12th January in a

canoe, and reached Eginé, at a distance of about 35 miles, the next day. Starting again on horseback in a north-easterly direction, through forest-land extensively cleared, they reached the village of Omu, where a quarrel between one of the porters and a native nearly caused a serious affray. This was, however, prevented by the presence of mind and judgment of the officers in charge of the Expedition. The party arrived at Odé in the afternoon of the same day.

Odé is about 26 miles N.N.E. of Eginé, and is surrounded by a wall about 12 miles in circumference. The houses are substantially built of red clay. The natives are a remarkably fine tall race. Their religion is gross fetichism; and both human beings and animals are occasionally sacrificed. Their principal food is maize, which is produced in great abundance, and is sold for about 2*d.* per bushel.

3. *Travels in Western Africa.* By W. WINWOOD READE, Esq.

MR. READE left England in December, 1861, and arrived at the Gaboon on the 13th February. He first made a six days' excursion into the Shekaní country on the right bank of the river. In March he went to Coriseo, and thence to Bapuka, where he remained about a month. Passing on to the Muni, he followed the main stream for about 30 miles, and then branched off by a tributary which led him to the spurs of the Sierra del Crystal. In May he ascended the Gaboon, and discovered the rapids in the heart of the Crystal Mountains. He then went to the Fernando Vaz, as far as Ngambi. After a visit to Prince's and St. Thomas's Islands, he sailed in a Portuguese schooner to Loanda. Here he was hospitably received by Mr. Gabriel, a Fellow of this Society, who has, however, since fallen a victim to the climate. After a trip to the interior as far as Ambaka, he sailed to the Cape de Verde Islands, whence he crossed to Goree early in December; and after visiting the Senegal, the Casamanza, and the Gambia, he finally returned to Europe in February last.

Mr. Reade made inquiries at Loanda, respecting Dr. Livingstone's supposition that the Quango joins the Zaire, and he found that it received unanimous confirmation. But there seems to be some doubt about the position of Matiamvo; the Secretary of Benguela informed him that the kingdom known by that name is situated to the south-east of that colony, and that a more powerful prince named Domba reigns to the east of Matiamvo. This was confirmed by the Commandant of Quellengues, a Portuguese fort in the interior. Mr. Reade saw at Ambaka a runaway slave of Matiamvo's,

who told him that the name of that tribe was the Boloni. The country itself, he said, was without hills or high trees like those at Ambaka; that the animals found there were lions, elephants, leopards, jackals, giraffes, wild cattle, and small monkeys.

Kikassa, a great river, is said to run from the rising sun to the north; another river called the Matiamvo joins it, coming from the west and running east; another large river, called Rû, passes close to Matiamvo's palace, and runs east and west; and in this river are hippopotami, while in the others are only crocodiles.

Mr. Reade in the main confirmed M. du Chaillu's account of the country and people.

The PRESIDENT said, the Paper showed that Mr. Winwood Reade was an enterprising traveller, who had visited many parts of Africa, but not, as he modestly said, as a scientific man. He had certainly brought before us some remarkable facts and statements respecting the natives. With regard to the concluding observations, he was happy to hear what Mr. Reade had said of M. du Chaillu. M. du Chaillu was about to embark on a new voyage to that country which he had explored on a former occasion under considerable difficulties; and he hoped to go out now more as a man of science than he did before, taking instruments with him, so as to determine some latitudes and longitudes. M. du Chaillu would be very happy if Mr. Reade or some other Englishman would accompany him.

CAPTAIN BEDINGFIELD, R.N., said, the only interest attached to his Paper would be its connection with our new colony of Lagos. He went to Porto Nuovo first of all, then to Abeokuta and Odé, in order to explain our reasons for the cession and to conciliate the different chiefs in the neighbourhood. He was particularly struck with the immense amount of industry of the natives. The whole distance they travelled, as far as they could see, the corn-fields on both sides were beautifully cultivated. They passed through one village entirely of blacksmiths; the whole village was taken up with forges, and the men were manufacturing the country hoes from native iron. They were received very kindly at all these places, and they succeeded in getting the objects they had in view carried out, one of which was to establish a market at Eginé for the trade from the Ijebu country. On their return they had a palaver at this market, and it was opened for trade. All these places had since been destroyed, and he was afraid that the feelings of the king in our favour had been very much modified. With regard to the bar at Lagos, when they first went in they had some difficulty, but afterwards ships came in frequently and with very little trouble. He had since heard by the last mail that another passage of 3½ fathoms had been opened out, so that he believed there would be very little difficulty in merchant-ships getting in. Trade was, however, at present entirely stopped on account of the wars; and those wars would, in his opinion, go on until the slave-trade was abolished.

MR. CRAWFORD asked if the King of Abeokuta or his prime minister could read or write, or whether Captain Bedingfield knew any negro who could read or write.

CAPTAIN BEDINGFIELD, R.N., replied, the king certainly could not, but he knew several negroes who could read and write.

MR. CRAWFORD thought that they must be remarkable, then; for, though the natives had been in communication with Europe three hundred years, it was a very rare thing for a negro to learn to read and write.

M. DU CHAILLU said he was about to undertake another journey in the part of the country which he visited last, up the Fernando Vaz river. He had at

length succeeded in getting a vessel, and it would require two months to prepare his outfit, which would be composed of baggage amounting to from fifty to one hundred tons. He intended to make a settlement at the mouth of one of the rivers, leave one or two white men there, and then go into the interior and explore. He would not promise too much to the Royal Geographical Society, for he might meet with impediments; but he sincerely hoped he should be able to reach a thousand miles, to stay there a time, and study the country, and then return. If life and health should be spared, he hoped to be able to write another account of his explorations. This time he should have more wisdom and more knowledge to apply to the task; still he was sure the book would be full of shortcomings, for which he knew the English people would forgive him. Although they did not agree on the gorilla question, he thanked Mr. Reade for the kind words he had spoken in his favour; and he also thanked the members of the Royal Geographical Society for the feelings they had always expressed towards him. He should work hard, and try to deserve their continued approbation.

The PRESIDENT stated that the next sitting would be on the 11th of May.

Twelfth Meeting, Monday Evening, May 11th, 1863.

SIR RODERICK I. MURCHISON, K.C.B., PRESIDENT, in the Chair.

PRESENTATIONS.—*J. A. Oldling, John Ritchie, and H. Bayley, Esqrs., were presented upon their Election.*

ELECTIONS.—*Rear-Admiral Horatio Thomas Austin, C.B.; Lieutenant I. Sale; Alexander Baring; James N. Dick; William James Farrer; Patrick Douglas Hadow; John Henry Mackenzie; William Simpson, and J. A. Wright, Esqrs., were elected Fellows.*

ACCESSIONS.—‘Notes on Ceylon and its Affairs during a period of thirty-eight years, ending in 1855,’ by James Steuart of Colpetty; ‘A Vacation Tour at the Antipodes, through Victoria, Tasmania, New South Wales, Queensland, and New Zealand, in 1861-62,’ by B. A. Heywood, Esq., M.A.; the ‘Anthropological Review’ for May, 1863; Map of British Columbia; Admiralty Charts and Ordnance Maps.

EXHIBITIONS.—Various curiosities from Australia were exhibited by Mr. Middleton, consisting of fishing-nets, necklaces, girdles, &c., of native manufacture, geological specimens, and sundry relics of Burke and Wills; also a lithographed view of a design for a National Memorial Obelisk to His late Royal Highness the Prince Consort, by George Peacock, F.R.G.S.

The PRESIDENT, in opening the business of the evening, said that there were no special papers to be read respecting one of the most adventurous and successful journeys that had ever been accomplished in Africa. He alluded to the expedition which the Society, aided by the Government, had sent out under Captains Speke and Grant, to proceed from Zanzibar into the interior of Africa, with the view to discover, if possible, the sources of the Nile. After very con-

siderable difficulties, that expedition had, when last heard of, arrived nearly at the position which Captain Speke reached in the previous expedition, under the command of Captain Burton. Instead of finding the country in a state of entire tranquillity, the people ploughing the land and occupied with agricultural pursuits, they found it in a state of great commotion, the different tribes quarrelling with each other, and invading each other's territories. The gallant officers were involved in considerable difficulties, and even the most sanguine of their friends at home began to despair of their success, for they had not then arrived at the great Lake Nyanza, which Captain Speke himself had discovered on his former expedition, and which he had named Victoria Nyanza. We now learned from a telegram, which had been promptly communicated to himself by Mr. Layard of the Foreign Office, that Captains Speke and Grant had arrived safely at Khartûm, on the Nile. He had every reason to believe, and the best African geographers he had consulted were of opinion, that these adventurous explorers had reached the White Nile, and had descended it from Lake Nyanza, and so have traced the sources of the Nile. We could not positively say that the source of the Nile had been discovered until we had fuller details; but he was inclined to believe that it had, because Captain Speke, in another telegram to the Foreign Office, sent word, "Inform Sir Roderick Murchison that all is well, that we are in latitude $14^{\circ} 30'$ upon the Nile, and that the Nile is settled." From these pregnant words he inferred that this great problem had at length been solved. The expedition was sent out by the Royal Geographical Society purposely to determine the sources of the Nile; and as this great Lake Nyanza (said by the Arabs to be 300 miles long) was a fresh-water lake, as its altitude had been proved to be nearly 4000 feet above the level of the sea, and as it trended from south to north, and waters flowed into it from the east and west, its exit must be towards the north; and hence the belief that the explorers had come down in a right line from south to north, and had really discovered the sources of the Nile. Another telegram had arrived, in which, as it appeared by the papers of the day, the discovery was announced in so many words. He sincerely hoped that they had set at rest this great question. In the time of the old Egyptian priests, in the time of the Pharaohs, in the time of the Greeks under Ptolemy, in the time of the Romans during all the imperial reigns of the Cæsars, it was always a great object to discover the sources of the Nile. And, previously to the present expedition, no one had ever succeeded, no one had ever traversed the interior of that country to which he was now directing attention. It was, therefore, one of the greatest geographical feats that had been accomplished in ancient or modern times. Cæsar himself is reported by Lucan to have said he would have given up that which was very dear to him, the civil war in which he was a great and successful conqueror, to have been the discoverer of the sources of the Nile. He thought we had reason to be proud that it was an Englishman and a Scotchman who had solved this great problem. He had another communication to make respecting the last telegram that had come, which contained a very important passage, "Mr. Baker has gone to the south-west." It would be remembered that Mr. Baker was the gentleman who had gone from Khartûm to Gondokoro, to meet and assist this very expedition of Speke and Grant. By putting dates together, he had come to the conclusion that Baker had been of considerable assistance to them; and that, with the true spirit of enterprise which animated him, he had afterwards turned off to the west, possibly following the same line which had been taken by the party of Dutch ladies whom he had mentioned on former occasions as having already been as far as Gondokoro, and who were now exploring that great *terra incognita* to the west. People might naturally inquire if no news had been received of Petherick. He hoped, with such a skilful explorer as Mr. Baker, aided by these Dutch ladies, that we should soon have satisfactory intelligence on the subject, for he had not himself yet given up hope that Petherick might still be alive. The accounts of his

death were not clear and definite: and as it was known that Mr. Petherick was a man of great endurance, he might have gone through great difficulties; at all events, whatever might be the result, we should soon have our anxieties set at rest.

Mr. GALTON doubted whether the source of the Nile would have been found in the Lake Nyanza. The reported size of that river above Gondokoro appeared to him too small to be commensurate with so great a source.

The PRESIDENT stated that in the year 1848, before the Lake Nyanza was discovered, and before the altitude of the great range of the Snowy Mountains was ascertained, Dr. Beke called attention to the possibility of discovering the sources of the Nile by another route, to come out at Sennaar, on the Blue Nile, and also to the possibility of there being a ridge at the northern end of the lake Victoria Nyanza, which would throw off the waters in the direction to which Mr. Galton had alluded.

Dr. BEKE said his idea was first conceived in 1846, that the sources of the Nile should be sought by entering from the coast in the neighbourhood of Zanzibar, and penetrating into the interior—in short, by taking very nearly the route which Captains Speke and Grant had followed. He himself had set on foot an expedition in 1848, which reached Zanzibar, but went no further. He believed that Claudius Ptolemy, the geographer of the second century, knew nearly as much of the sources of the Nile as we were likely to know in a few days. That writer described the snowy Mountains of the Moon as being to the west of the "Barbarian Gulf," near Zanzibar, round which dwelt the Cannibal Negroes, and said that beyond that were the two lakes of the Nile, which received the melted snows from the Mountains of the Moon. Dr. Beke further stated that he had founded his views upon this text of Ptolemy, and substantially they were now confirmed. His opinion was that the mountain-range of Eastern Africa continued to the south of Nyanza; that Captain Speke crossed the ridge in about 35° E. longitude; that the water-parting is to the south of the lake, and not to the north; and that consequently Nyanza drains into the Nile, whether by the river which passes by Gondokoro, or by any other stream, it is impossible to say, till we receive fuller particulars from the travellers. We did not know the longitude of the river at Gondokoro, but we knew that its altitude there is not more than 1700 feet, and that the lake, which is at a very short distance from it, is nearly 4,000 feet. A few days would determine whether his views were right or wrong.

The PRESIDENT, before calling upon Dr. Shaw to read the following communications respecting the most recent journeys in Australia, stated that two of the distinguished explorers of that great continent were then in the room—Mr. Landsborough and Mr. Middleton. Mr. Landsborough, who, as Sir Henry Barkly said, had done more to utilise the colony than any explorer who ever went out, having traversed Australia from north to south, after a previous exploration to the south-west from the Gulf of Carpentaria, had brought before us absolutely the real condition of the "Plains of Promise," and the capability of the land for settlement by Europeans, and for the production of sheep and wool. Mr. Middleton was second in command of the M'Kinlay expedition from South Australia.

The Papers read were—

1. *Extracts of a Despatch from His Excellency Sir George Bowen to His Grace the Duke of Newcastle, in reference to the Colony of Queensland, dated Brisbane, 8th January, 1863.*

"I HAVE the honour herewith to transmit three copies of the Queensland Book Almanack for 1863. The historical and topogra-

phical sketch of the progress and present condition of this colony, including the cotton plantations, therein contained, will be found clear and accurate.

"I would particularly call your Grace's attention to the map accompanying the volumes. It appears that this colony now comprises an area of about 678,000 square miles; that is, a surface nearly six times greater than that of the United Kingdom, and above three times greater than that of France. It is estimated that the pastoral occupation within our limits already covers a surface about twice larger than that of the British Isles; and it is rapidly spreading, for the recent explorations of Messrs. Burke, Landsborough, Walker, and M'Kinlay, prove that almost the whole of our vast territory is available for settlement. In other words, Queensland is by far the most extensive in territory, while it is undoubtedly the most favoured in soil and climate, of all the provinces of the British empire.

"They beg to suggest that one of the accompanying volumes should be presented to the Royal Geographical Society; and that the attention of that body be particularly directed to the prefixed map, as exhibiting the only authentic description of the boundaries and divisions of Queensland which has hitherto, so far as I know, been published."

2. *Extracts of a Despatch from His Excellency Sir H. Barkly to the Duke of Newcastle, in reference to Mr. Landsborough's Expedition, dated Melbourne, 24th August, 1862.*

"AGREEABLY to the instructions in your Grace's despatch of 26th May, No. 31, I placed the watch therewith forwarded, on behalf of the Royal Geographical Society, in the hands of King, the explorer, and have now the honour to transmit a paper containing a copy of the proceedings on the occasion, which were of a very gratifying nature.

"It will be perceived that I availed myself of one of the meetings of the Royal Society of Victoria, under whose auspices the Burke and Wills Expedition was despatched; and that Mr. Landsborough, the leader of one of the parties sent to its relief, who had just reached Melbourne after a most successful journey from the Gulf of Carpentaria, happened fortunately to be present, and added additional interest to the same.

"I stated when I last wrote that Mr. Walker had started on 20th December from the depôt on the Albert River, with the view of following up the tracks of Burke and his companions, which he had

found on the Flinders River, on his outward journey; and that Mr. Landsborough, who subsequently returned to the Albert from a fruitless journey to the south-west, intended to leave it about the middle of February on a similar errand, in case the first party should miss the trail.

"This extra precaution was not unnecessary, for after tracing Burke to his second or third Return Camp with difficulty, owing to the rains which had fallen, Mr. Walker was obliged to abandon the attempt in consequence of not finding any signs of his farther progress southwards; and striking off towards the north-east, managed, not without many hardships and dangers from the exhaustion of his stores, and loss of his horses, to reach Port Denison safely, by the end of April. Mr. Landsborough likewise, as will be seen from the narrative, failed to discover the route pursued by Burke, though he travelled up the banks of the Flinders for about 400 miles, the heavy floods which prevailed having even obliterated the recent traces of Walker and the large number of horses which he took with him. Notwithstanding this failure, however, Landsborough continued his course in a southerly direction, merely crossing the hills for about 20 miles, till he reached the source of the Thomson, a river known to flow towards the south-west, and found by him to be one of the main tributaries of the Cooper. When within about 150 miles, however, from the dépôt formed by Mr. Burke prior to starting for Carpentaria, fearing for the sufficiency of his provisions, which from the first had been short, he turned off, and striking the River "Warrego," followed it down until he struck the Darling itself, above Fort Burke.

"By this journey, in which he was the second to cross the Australian Continent, through a country so favourable, and with such facility that a foal dropped on the Flinders accompanied its dam all the way, Mr. Landsborough has not only made a most important addition to our geographical knowledge, but has practically accelerated in a remarkable degree the formation of a northern settlement.

"With regard to the first, he has taught us that Sturt's Desert extends but a short distance eastwards, and that between it and the foot of the eastern chains of mountains, spreads a fine pastoral country, watered by rivers which find an outlet in lakes to the south-west; whilst, more unexpected still, the water-parting between those streams trending southward, and those which flow north to the Gulf of Carpentaria, proves to be scarcely more than 20 miles in width, and may be crossed at an elevation of about a thousand feet.

"As to the second point, already stock are being driven from New South Wales to these fresh pastures, and the best informed newspapers here predict that, before another year shall have elapsed, the whole continent east of the 140th degree will be mapped out and occupied for grazing purposes.

"It may appear strange that with large tracts within the limits of existing settlements yet but nominally stocked, the exodus to tropical Australia should be so rapid, but the rainfall of the new country is believed to be heavier and more regular than on the Darling; and at the same time the Australian air is so comparatively dry, even in the tropics, and the all-pervading forests of "gum-trees," so open and free from jungle, that the climate is far healthier, and more endurable by European constitutions, than in similar low latitudes in other portions of the globe.

"Moreover, the prospect of easy access to the sea on the north coast is a great attraction to squatters, and it will be seen from the accompanying pamphlet, that plans for a city at the mouth of the Albert River have assumed something like a definite shape, and are encouraged, I believe, by the Queensland authorities.

"The task of Australian exploration, as undertaken by this colony two years since, having been thus effectually performed; the veil lifted from the fate of the intrepid pioneers, whom it sent forth; and the chief objects which the promoters of the scheme had in view, being in process of successful accomplishment, it remained but to recall the party under Mr. Howitt, who had been instructed not to abandon the depôt on Cooper Creek until the safety of Walker and of Landsborough's parties had been ascertained.

"Some hesitation was felt by the Exploration Committee here in so doing, in the absence of all information regarding M'Kinlay, who was despatched about a year since from South Australia to look for Mr. Burke, and who, after discovering what he conceived to be the remains of the missing explorers (though in reality but those of Gray), again proceeded northwards in December last, and has not since been heard of. Learning, however, from the South Australian Government that no apprehensions are entertained as to his safety, and that he had orders to explore the country towards Central Mount Stewart, and to return to the settlements *via* Finniss Springs, where ample supplies await him, it was at length determined to despatch the requisite instructions to Mr. Howitt, directing him to bury what provisions he can spare, for the benefit of whoever may visit the depôt, and to return with all hands to Mount Serle, *en route* to Adelaide."

In reply to questions put by Sir Charles Nicholson and the President, Mr. LANDSBOROUGH said the country on the Gulf of Carpentaria was extremely fine,

and, from his experience as a squatter, eminently adapted for growing wool. He had had sheep within the tropics, on a station situated a little to the north of Rockhampton, on the shores of Broad Sound; and although the sheep did remarkably well there, and grew a very fine description of fleece, and of a sufficient weight to make wool-growing there very profitable, and much more so than in some parts more to the southward that had a very cold climate, where he had had sheep-runs, yet he considered much of the country that he had seen at Carpentaria far superior. Before M'Arthur introduced fine-woolled sheep into Australia, nothing but hair was produced there; and now, as far north as latitude 19° from the southern shores of Australia, the colonists have demonstrated the fact that, by judicious breeding, they can everywhere produce fine wool. And it is quite notorious that, on the whole, the wool grown in the north is at least as fine as that which is grown in the south. With regard to the climate of Australia, he ought to know something about it; for he had travelled all over the settled parts, and also from the northern to the most southern shores. On the shores of Carpentaria they had about 100 people during the hottest period of the year, and he never heard of illness among them. Again, at Rockhampton, there was at one time a rush of population from the southern parts of Australia to the gold diggings which had been discovered there. Some ten thousand people were collected; and though they were disappointed at not finding gold so abundantly as they expected, and though they were there during the warmest season, he never heard any complaint of want of health among them. Before starting for Carpentaria he was told that it would be impossible to land the horses; but the only trouble they had when they ascended the Albert River was to throw a few planks from the vessel to the land, and the horses walked ashore. The natives in the north were like those in the south, and he considered them on the whole neither inferior nor superior. He found the "Plains of Promise" quite equal to what Captain Stokes described them to be,—a fine pastoral country, and very open forest. With regard to the rivers that fall into the Gulf of Carpentaria,—the Albert, the Flinders, and the Nicholson,—the best account we had of them was still that by Captain Stokes. However, when he was at Carpentaria, Lieutenant Woods, of the man-of-war sloop *Victoria*, was sent to explore the Albert, and he returned with a report that it was navigable for the sloop. The Flinders was explored by Captain Norman, and he thought it superior to the Albert. The Nicholson was not as good as the others.

Mr. MIDDLETON, at the request of the President, related the particulars of the great peril in which his party found themselves upon one occasion, owing to a sudden flood caused by heavy rains. They had reached rather a large creek with only water-holes in it. They were compelled to camp there owing to some of the bullocks being knocked up from the great heat, the thermometer standing at 166° on the side of the tents. During the night it came on to rain a little: it increased all the next day. The creek began to rise, and it was thought desirable to be moving; but as the camels and bullocks were all out grazing, and it would be difficult to collect them together, it was resolved to wait till the morning. In the morning they found they were surrounded by water; nothing but a sea in every direction, as far as the eye could reach, except to the south-east, where there were some patches of sandhills about three-quarters of a mile off. There was no time to be lost, not even to get breakfast: the men had to swim out to get the bullocks, camels, and sheep. The flour, provisions, and ammunition had to be placed on the camels' backs, and they made their way to the sandhills, where they were compelled to remain about eleven days before they could move. The region which they were then traversing consisted of nothing but sand as red as Cayenne pepper; not a stone nor even a pebble was to be seen. They were months and months on the sand, but fortunately always got water, though sometimes they travelled twenty or twenty-five miles, and on one occasion, twenty-nine, before coming to a creek

with water-holes. The camels were very serviceable, and seemed to be the very kind of animal wanted in Australia; but they suffered more from the want of water than the horses. Mr. M'Kinlay was an excellent leader, and acted with great judgment on the journey: a more noble and generous-hearted man he never met. Mr. Middleton then called attention to the various specimens of fossil organic remains, and articles of native manufacture, which he had brought home with him and had placed upon the table.

Mr. LANDSBOROUGH was then questioned at some length by Mr. Crawford, respecting the "Plains of Promise" as an eligible country for the growth of wool; and in reply he stated that he was there during the wet season, from October to February, and that during the first three weeks on the Albert River the mean temperature was within a fraction of 80°. In the southern parts of Australia he had no doubt the thermometer stood quite as high as Mr. Middleton had stated. He quite agreed that in certain portions in the south there were extremes of heat and cold; but he did not consider that an advantage. So far from thinking the northern portions of the country unsuited for pastoral purposes, he was sorry that he had not gone to Queensland sooner. Old Australians would confirm his statement that the hottest parts of Australia were on the Lower Murray and the Lower Darling. This was owing in some measure to hot winds, of which they had none in the tropics.

Mr. CRAWFORD said this might be true in summer, but it would not apply to the average of the whole year. Did Mr. Landsborough perceive any difference between the vegetation of the "Plains of Promise," which appeared to be in the latitude of Bombay—rather a warm climate for a large fleece and fine wool—and the vegetation of Queensland?

Mr. LANDSBOROUGH said there was a difference, and the advantage was on the side of the "Plains of Promise." It was just the kind of vegetation that a sheep-farmer liked best.

Mr. CRAWFORD said it might be. He had seen good sheep, so far as the flesh was concerned, in Java and Sumatra; but the wool was the question. The experiment had never yet been tried of producing fine wool in such a temperature.

Mr. LANDSBOROUGH replied that he had tried sheep-farming for several years in Queensland, within the tropic of Capricorn, and he found that sheep were profitable there for their wool.

Mr. CRAWFORD said the sheep was intended for a temperate climate. Was not the fleece given to the sheep by nature to protect it from the cold? And when it came within eighteen degrees of the equator it could not possibly require the fleece there that it required in a cold or temperate climate.

Mr. LANDSBOROUGH.—You are theorising. Who of all the human race have got the most wool on their heads? Is it not the negro who lives within the tropics? (Laughter.)

Sir C. NICHOLSON said it gave him great delight to see Mr. Landsborough and Mr. Middleton in England. It was but recently that he had had the opportunity of expressing his high appreciation of the courage, enterprise, endurance, and ability of Mr. Landsborough, and of his merits as a scientific explorer. With reference to the country which he had passed through, it was now established that the whole of the region to the east of the 138th meridian was of the best possible description, abounding in the finest pastures, and capable of occupation and settlement. That magnificent district of the valley of the Fitzroy, an area as large as the British Isles, presented enormous tracts ready for occupation, requiring no clearing, simply enclosing, applicable for the purposes of pasture, and also for the growth of all kinds of tropical produce. He might mention that one of the first instalments of cotton from Queensland was received in London from Brisbane a few days ago. It consisted of seventeen bales: two of the bales fetched 3s. 6d. a pound, at public auction; and the remainder averaged about 2s. 6d. a pound. This seems a very encouraging

circumstance, as showing the capability of the colony for the production of this great staple, and the superior character of the article itself. Sir Charles Nicholson again urged the importance of the Imperial Government taking some steps with reference to the establishment of a new and independent colony in North Australia; and concluded his observations by stating as a fact, in answer to Mr. Crawford's objections, that there were at the present time above a million of sheep within the tropics, many of them in a line as far north as 18° ; the clip every year giving an average yield of 2 lbs. per sheep.

The PRESIDENT congratulated the Meeting upon the light which had been thrown upon this Australian subject by practical men, who had brought out facts against theories. He rejoiced particularly in the result of these communications; because he had for many years advocated the establishment of a colony in North Australia, and he had always held to the opinion that it would turn out a good country for settlement. He believed the isothermal lines were not similar in North Australia and in the southern parts of India and the Malayan Archipelago. The extent of the Indian Ocean on both sides of the peninsula of Hindostan communicated great heat to that portion of land; whereas in Australia, with great breadths of land and high plateaus on either side, there were geographical reasons for a different arrangement of isothermal lines which even in theory explained the facts that had been brought before them by Mr. Landsborough and others. He agreed with Sir Charles Nicholson that North Australia ought to be formed into a new colony. In the maps of the Society of Useful Knowledge in 1848 they would find North Australia mapped out under that name. It was then a country without inhabitants, without prospects, without the least notion on our part of anything being realised there, except that Captain Stokes had disembarked in the southern part of the Gulf of Carpentaria, and had very appropriately given to that land the name of the "Plains of Promise." These were very gratifying facts to old geographers; and he was much delighted with the result of the discussion. He begged, on the part of the Society, to return their most hearty thanks to Mr. Landsborough and Mr. Middleton.

ADDITIONAL NOTICES.

(Printed by order of Council.)

1. *Extract of a Letter from DR. BEKE to SIR RODERICK I. MURCHISON.*

My object is to direct attention to what may be called the Delta of the Ethiopian Nile—formed when the Delta of Lower Egypt was not—which has a material effect on the latter; for, whatever may be the source of the waters of the inundation of Lower Egypt, it is the Athāra which brings down from the Upper Delta the *slime* which fertilizes the land.

The extensive *alluvial* plains of Ethiopia, which have thus been abraded and carried down by the Nile to form and fertilize Lower Egypt, are those to which Mr. Samuel W. Baker has recently drawn attention as "a possible source of an abundant supply of cotton," and which (as you will perceive from the enclosed document) I brought to the notice of Her Majesty's Government *thirteen years ago*; this being, in fact, the source whence the Egyptian cotton was derived, which forty years ago did not exist, and now in this present year is calculated to produce 150 millions of pounds in weight!

2. *Extract of a Letter, dated Gwadar, 5th April, 1863, from Mr. WALTON, in charge of the Line of Telegraph from Kurráchi to that Port, to Major F. Goldsmid.*

THE double line to Ormara was only completed in the middle of January. You can imagine the work it has been, getting tons of iron posts and wire up the Malan, over 2000 measured feet in height. From Kurráchi to Sonmeani I kept near the regular track. From Sonmeani onwards I kept well to the northward of your route,* striking a straight line over the hard sand-hills near the inland lake Soerundo, then meeting your track again at Buddo. I went to Churr and Poor-i-Soont, near the pilgrims' path in *bad weather*—not by the path you adopted, which is the fine weather pass, and likely to be sometimes flooded. From Poor-i-Soont I kept well to the northward of your route, hugging the Háro Mountains to Aghor, and spanning the cleft in the mountains caused by the Hingole flowing through. Then, instead of turning to the north, *viâ* Hinglaj, I found a valley called the Shum Valley, which leads out to the sea, although it was full of "shor" and other abominations peculiar to Mekran.† I considered this my best route, bearing in mind my settled determination to span the eastern face of the Malan. Over a mile and a-half of most difficult "shor" hills between the Shum Valley and Malan Bay the line runs along to the foot of the eastern precipice. The exact height of the drop here is 1620 feet, and it is taken over the level plain at the top to the back of the Khor Butt Valley. Up the rock at this point I cut a road, up which material was brought by manual labour—no easy job, considering each post weighs over 2 cwt., and each mile of double wire 12 cwt., at least. Then down the Khor Butt Valley and along the sea-side to the Manheji, which is spanned by masts close to its mouth. Thence in a north-west direction, in order to cross the Gorhud at a narrow place five miles inland, and keeping the line about that distance from the sea, and to the north of your route, we strike down the isthmus into Ormara on the western side, in order to avoid the drift sand-hills. . . . From the top of the Ormara isthmus I struck off direct for Bussule, keeping well under the hills to clear the Kulmut swamp,‡ and following your route to Shor Kundi; then, instead of going by the sea-side, we go through the "Shor" ranges, and come out at the back of Pusini. From Pusini I struck a line direct to the *mouth* of the Shinzánee, and, spanning this, made direct for Mehmed-i-Bul; then, cutting through the Kurwal "shors" to Barambah, the line will come in at the back of the Médée to Gwadar.§ . . . I need not tell you of the physical difficulties of the country we have come through. The want of water in many places has driven us to endure great hardships. A body of 25 Europeans and 600 natives passing through this utterly barren country must expect to meet with very great difficulties. Often I have been obliged to prohibit ablutions of any kind, and to place guards with drawn swords over dirty puddles; but, thank God! we have nearly completed our undertaking now with a trifling loss of men, and not very serious loss of camels. From Kurráchi the double line is completed and working to Shor Kundi, and from Pusini to the Karwat Pass; and the line will be entirely finished || by the end of this month. Both Europeans and natives have throughout behaved excellently, and, by enforcing the strictest discipline, I have now nearly got through the enterprise without a grumble. Of course, all had to be fed from Kurráchi; and the posts being

* Par. 10 of Major Goldsmid's printed Report, and more particularly par. 12.

† Par. 13 of ditto.

‡ Par. 15 of ditto.

§ Par. 18 of ditto, and Mr. Ryland's Report in Appendix.

|| Reported complete by last mail.

all of iron, brought from England, were distributed eighteen to the mile, and required many camels, which were likewise almost entirely supplied with provender from Kurráchi. We are all exhausted, and glad our labours are near an end, as the hot weather has again set in, and many deaths are occurring among the natives. . . . I have given Mr. Mansfield some curious fossils from the top of the Malan. Government should send a qualified geologist there. It is covered with wonderful fossil remains.

PROCEEDINGS
OF
THE ROYAL GEOGRAPHICAL SOCIETY.

SESSION 1862-63.

Thirteenth Meeting (ANNIVERSARY), 1 P.M., May 25th, 1863.

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

THE Chair having been taken at 1 P.M. by the President, Sir Roderick Impey Murchison, K.C.B., the Minutes of the former Meeting were read and confirmed.

The regulations respecting the Anniversary were next read, and the Chairman appointed Commander Chas. Bullock and the Rev. James Worthington, D.D., Scrutineers for the Ballot.

The Earl of Belmore; Frederick Bullock, Esq.; H. H. Browne, Esq.; Edward Clowes, Esq.; the Rev. H. G. Clements; M. P. Edgeworth, Esq.; Thomas F. Hall, Esq.; Charles John Leaf, Esq.; Viscount Milton; Francis Snowden, Esq.; Dr. George E. Spickernell; the Hon. Henry P. Vereker, LL.D.; Henry Waite, Esq.; Sir John P. Boileau, Bart.; Dr. W. Buchanan; John Brunton, Esq.; Thomas F. Callaghan, Esq.; S. W. Courtenay, Esq.; G. F. Heneage, Esq.; Sir Thomas D. Lloyd, Bart.; Captain Lovell; W. Winwoode Reade, Esq.; R. H. St. Andrew St. John, Esq.; John Taylor, Esq.; William O. Whyte, Esq.; Chas. N. Welman, Esq.; and Lieutenant-Colonel the Chevalier Sonklar von Instätten, as Honorary Member, were proposed as Candidates for admission into this Society, and their Certificates were accordingly directed to be suspended in the Office until the next ensuing Meeting.

The Report of the Council, with the Balance Sheet for 1862, was then read and adopted.

In the absence of Mr. F. T. Gregory, the President delivered the FOUNDER'S GOLD MEDAL to Mr. Spottiswoode on behalf of Mr. Frank T. Gregory for his successful explorations in Western Australia, during which he determined, astronomically, 58 positions for latitude, and 19 for longitude.

The PATRON'S GOLD MEDAL was awarded to Mr. John Arrowsmith

for the very important services he has rendered to geographical science in general, and especially to the Royal Geographical Society, from its foundation to the present time.

A GOLD WATCH was presented to Mr. W. Landsborough; a similar watch to Mr. Thomas Middleton for transmission to Mr. John M'Kinlay, and a third to Mr. F. Walker, for their successful explorations in North Eastern Australia.

The Anniversary Address was then read by the President, to whom a unanimous vote of thanks was passed, coupled with a request that he would allow the Address to be printed.

The Ballot having been concluded, the Chairman declared that the changes advised by the Council had been adopted, viz.:—The vacancy among the Vice-Presidents caused by the retirement of Major-General Portlock, to be filled by Viscount Strangford; that in the list of Secretaries by the resignation of Francis Galton, Esq., to be filled by Clements R. Markham, Esq.; and those among the Ordinary Councillors by the retirement of John Arrowsmith, Esq.; Sir George Back; Thomas H. Brooking, Esq.; Earl Ducie; Colonel Lefroy; Clements R. Markham, Esq.; Dr. Rae; Viscount Strangford; and Count Strzelecki, to be filled by Colonel G. Balfour; James Fergusson, Esq., F.R.S.; Sir Thomas Fremantle; Francis Galton, Esq., F.R.S.; William Hamilton, Esq.; Sir Charles Nicholson; Commodore Alfred Ryder; the Earl of Sheffield; and Colonel Henry Yule.

The thanks of the Society having been voted to the retiring Vice-President and Members of Council, and after some remarks on the recent changes by Drs. Worthington and Webster, the Chairman in conclusion announced that the customary Annual Dinner of the Society would be held the same evening at Willis's Rooms, and the Meeting thereupon adjourned.

PRESENTATION
OF THE
ROYAL AWARDS

TO MR. F. T. GREGORY FOR HIS SUCCESSFUL EXPLORATIONS IN WESTERN AUSTRALIA; AND TO MR. JOHN ARROWSMITH FOR THE VERY IMPORTANT SERVICES HE HAS RENDERED TO GEOGRAPHICAL SCIENCE IN GENERAL, AND ESPECIALLY TO THE ROYAL GEOGRAPHICAL SOCIETY FROM ITS FOUNDATION TO THE PRESENT TIME.

GOLD WATCHES, BEARING HONORARY INSCRIPTIONS, WERE ALSO AWARDED TO MR. WILLIAM LANDBOROUGH, TO MR. JOHN M'KINLAY, AND TO MR. FREDERICK WALKER, FOR THEIR SUCCESSFUL EXPLORATIONS IN AUSTRALIA.

THE PRESIDENT, after recapitulating the reasons assigned in the Report of the Council for the adjudication of the Founder's Medal to Mr. Frank T. Gregory, enlarged upon the importance to geographers as well as to colonists of the last researches of that gentleman, in which he had so successfully and with such precision explored a large well-watered and fertile region to the north-east of the colony of West Australia, and had thus won for himself a renown which placed him side by side with his distinguished brother, Mr. Augustus Gregory, the intrepid explorer of the northern and north-eastern shores of that great continent. He further remarked, that among Australian surveyors and astronomical observers, Mr. Frank Gregory had rendered himself conspicuous by collecting geological specimens; in doing which, on the occasion of one of his former journeys to the west and south-west of the settled country, he was the first to assign the true age of certain secondary formations, the existence of which in Australia had been previously unknown. Having particularly adverted to the foresight and sagacity displayed by Mr. Gregory in organising his last great expedition during his previous visit to England, the President spoke of the gratification he had himself experienced when, supported by the Council, he obtained from his Grace the Duke of Newcastle, Her Majesty's Secretary of State for the Colonies, a grant of one-half of the ways and means, without which this great addition to our acquaintance with the shores and interior of North-Western Australia could not have been brought about.

Sir Roderick then expressed his regret that in consequence of the anniversary having occurred during the Whitsuntide recess, his Grace the Duke of Newcastle, and both the Under-Secretaries of State for the Colonies, were out of town, and therefore unable to attend that day to receive the Founder's Medal, which, however, he would transmit to Mr. Chichester Fortescue, M.P., who had taken

a very active and friendly part in supporting the project of Mr. Frank Gregory, as recommended by the Royal Geographical Society, and who therefore, together with his chief the Duke of Newcastle, deserved the best thanks and acknowledgments of the Society.

Having handed the Founder's Medal to the Secretary, Mr. W. Spottiswoode,

The President then said that he never had been more gratified than when the Council adjudicated the Patron's Medal to his old and valued friend, Mr. John Arrowsmith, who would unquestionably have received the honour long ere this had he not himself, by his continual advocacy of the claims of distant travellers and surveyors of our colonies, rendered unavailing our endeavours to confer upon him a distinction so well merited. The perspicuity and fidelity with which Mr. John Arrowsmith had laboured for many years in analysing and comparing the often crude and hastily-constructed sketch maps which travellers brought home from distant lands, and the pains he took, irrespective of any pecuniary profit, to delineate such fresh knowledge on his maps, have justly rendered his name famous among practical geographers. "Let us say," added the President, "that there is a peculiar fitness in seizing the present opportunity of presenting the Patron's Medal to Mr. Arrowsmith, inasmuch as, in consequence of the number of years he has served on the Council, he retires, for a year only I hope, from his seat at our board, and as his modesty has prevented him from attending to-day, I feel fully justified in saying that every one in this assembly rejoices with the Council and myself in seeing this recompense bestowed on so eminent and practical a geographer as John Arrowsmith."

Reverting to the consideration of the explorers of Australia, the President then said that in his Address he would dwell so emphatically on the value of the explorations of McDouall Stuart, Landsborough, M'Kinlay, and Walker, that it was unnecessary he should now advert to their great merits.

The first-named gentleman had already received the highest honour the Royal Geographical Society had it in its power to bestow, not merely on account of his adventurous expeditions across the interior of Australia, but also because he had made accurate and therefore most valuable geographical determinations of latitude and longitude.

To Messrs. Landsborough, M'Kinlay, and Walker, the Council presented gold watches, with suitable inscriptions.

The President then addressed Mr. Landsborough in highly complimentary language, the purport of which is to be found in the Address, and that gentleman made an appropriate reply.

The watch of Mr. M'Kinlay was delivered to his companion, Mr. Thomas Middleton, who, as well as Mr. Landsborough, gave a graphic account of some of the peculiar characteristics of the countries traversed, and the difficulties they had to surmount.

The watch voted to Mr. Walker was confided to the care of the Secretary, for transmission to that gentleman.

ADDRESS

TO THE

ROYAL GEOGRAPHICAL SOCIETY.

Delivered at the Anniversary Meeting on the 25th May, 1863,

BY SIR RODERICK IMPEY MURCHISON, K.C.B.,

PRESIDENT.

GENTLEMEN,

IN this, the Ninth Anniversary Address which I have had the privilege of delivering to the Fellows of the Royal Geographical Society, I have to claim your indulgence yet more than on previous occasions, inasmuch as, besides the enlargement of our subjects of inquiry, my numerous other public avocations have prevented my devoting sufficient time to the preparation of the matter to which I have now to call your attention.

Like the noble Lord, my immediate predecessor, however, I am happily able to begin with hearty congratulations on the continuous rise in the prosperity of the Society, and the great increase of our members; albeit that the hand of death has stricken too many of our associates, and among them men of distinguished eminence.

In the Obituary, with which I commence, I will dwell only on the character of those of our Members who were either known as geographers, or distinguished in public life, science, letters, and the arts: yet, even when so restricted, the list, I regret to say, is sad and long.

OBITUARY.

WHILST no practical or scientific British geographer of note has been taken from among ourselves since the last anniversary, we have to

condole with our allies the French on the loss of a man who, during a long life, has greatly and steadily advanced our science, and who was justly elected in our earliest days a Foreign Member of our Society. M. JOMARD, a native of Paris, was born in 1777, and at the period of his death had therefore reached the great age of eighty-five years. By pursuing in his youth those studies in physical science in which our sister country is so distinguished, he laid the foundation of that eminence which he subsequently attained. When but twenty-one years of age, he was chosen one of the corps of *savans* who accompanied General Bonaparte to Egypt; and hence it was that, in the last year of his life, he and my lamented friend the late eminent geologist Baron Cordier, who died in the same year, were the only two remaining members of that very remarkable group of men of science. Just as Jomard was vigorously occupied up to the last days of his life in promoting geography, so Baron Cordier, when aged eighty-four years, explored a large portion of the Alps on foot, and returned to Paris to resume his last lectures at the Jardin des Plantes, which he delivered with his accustomed vigour. Honour to the great soldier, who, at a moment when his countrymen had hardly emerged from the shock of a mighty Revolution, insisted on being accompanied to the classic soil of Egypt by such a scientific body-guard! For, although that expedition ended in a military disaster for France, yet, by her illustrations of the famous days of the history of Egypt, she acquired a reputation which will survive many of the glories of her warlike deeds in arms.*

To proceed, however, with the sketch of the life of the young savant who returned from the campaign in Egypt. Having by great perseverance succeeded, after years of labour, in preparing for publication the great work of his associates and himself, entitled 'Description de l'Egypte,' M. Jomard visited England after the peace in the year 1814: and, through the influence of Sir Joseph Banks and others, he obtained permission to take casts of those

* I may here say, that, notwithstanding this great example set us by the French, England totally neglected the opportunity recently offered to her in the war of the Crimea, in not attaching any men of science to the British army. In fact, when the army was leaving our shores in 1854, an earnest appeal which was made on the part of the scientific Societies of London, in which I took an active part, was rejected. It thus came to pass, that, after all its marches in Bulgaria, and long campaign in the Crimea, few or no real additions were made to our acquaintance with the physical geography, geology, or natural history of those countries. The want of a consulting geologist was indeed sorely felt at the siege of Sebastopol, when the necessity of sinking artesian wells for potable water became imminent; and then I was uselessly consulted on the subject.

great Egyptian works of art which he had admired when he thought they were destined for his own Louvre, but which the fortune of war had brought to our British Museum. Acquiring an insight whilst among us into the new system of education, that of mutual instruction, we next find him giving his first lecture at Paris on elementary education, on the very day of the battle of Waterloo! In 1818, in recompense for his antiquarian researches, he was elected a member of the Academy of Inscriptions and Belles Lettres. Successively, indeed, he became a member of nearly all the scientific Academies and Societies of Europe; but in this place and on this occasion our chief ground for honouring the memory of M. Jomard is, that, having earnestly contributed to found the Geographical Society of Paris, he was during forty-one years one of its most active and zealous members, and often acted as President or Vice-President of that body. His memory has truly another special claim upon our acknowledgments, inasmuch as he was the organizer and administrator of a new department in the National Library of France for the collection and arrangement of the maps of all nations,—a situation for which his acquaintance with many languages, and his active correspondence with geographers of other countries, singularly well fitted him.

In addition to his numerous writings on Egypt, M. Jomard has largely augmented our acquaintance with the geography of Africa by his liberal encouragement of travellers. One of the most striking proofs of this leading feature in his character was the warm manner in which he took up the cause of the poor traveller René Caillaud, and his efficient superintendence of the publication of a work which established the truthfulness of the journey to Timbuctoo of that poor, half-educated, yet enterprising Frenchman, who had been unjustly stigmatized as an impostor.

Rivalling the eminent Portuguese geographer, the Vicomte de Santarem, in the collection of maps and records from the earliest periods, M. Jomard brought out, entirely at his own cost, amidst various other important documents, the Map of the World by Juan de las Casas, the pilot of Columbus. During the last twelve years of his indefatigable labours, we learn from his gifted biographer M. de la Roquette, that he prepared a memoir, adopting the theory that Arabia had been the source whence the population of Egypt had been derived. Besides taking a lively interest in the construction of the canal of Suez, in the formation of the Acclimatisa-

tion Society of Paris, and in archæological researches, it is well known that, when arrested by death, he was, even at his great age, preparing a new edition of his collection of Maps, with a general Introduction.

When we look to M. Jomard's contributions to the great work, '*Description de l'Egypte*,' which were thirty in number, to his notices in the '*Comptes Rendus*' of the Institute, and in the '*Journal des Savans*,' with his numerous writings in the *Journal* of the French Geographical Society, as well as to his communications to our own, we cannot fail to admire the untiring energy of our honoured Foreign Member. Of this venerable man I can truly say with his associate, biographer, and eminent colleague, M. de la Roquette, that his hospitable house was equally open to foreigners as to Frenchmen, and that he gave to all such a kind reception, that, whether we view him as the enlightened commentator on, and analyst of, all geographical labour, the energetic promoter of our science, or the warm and kind friend of all his associates, M. Jomard will ever be remembered as one of the true benefactors of this age.*

The late Viceroy of Egypt, SAID PASHA, had been so kind a friend to all English travellers, that when His Highness recently visited our metropolis we did honour to ourselves in electing him a Fellow of the Society. In thanking His Highness for his good will towards my countrymen, I expressed a hope that he might be able to aid Captains Speke and Grant in their efforts to discover the sources of the Nile, adding that I feared the difficulties they would have to encounter were in regions beyond his territories. "Still (replied the Pasha), I shall have it in my power to help them; for be assured that my frontiers are very elastic."

We have lost another of our Foreign Members in Dr. HAMEL, a member of the Imperial Academy of Sciences of St. Petersburg. Dr. Hamel was a man, of knowledge, ability, and great perseverance, who had travelled much, observed keenly, and was well known to men of science in most parts of Europe and America.

The Marquis of LANSDOWNE.—Of our own countrymen and Fellows of the Society who have died in the past year, I will first speak of that venerable and illustrious nobleman, the Marquis

* For a full account of M. Jomard's writings and proceedings, see the excellent sketch of him by his friend, M. de la Roquette. (*Bulletin de la Société de Géographie*, tome v., Février, 1863, p. 81. With a portrait.)

of Lansdowne. The demise of this venerable statesman, in the eighty-third year of his age, has justly called forth from men of all classes and of all pursuits the expression of their admiration of his enlightened, patriotic, and noble character. It is not for the President of this Society to attempt to pronounce an eulogy worthy of such a man; for that has been well done by the leading statesmen in both Houses of Parliament, whilst every section of the daily press* has vied with its fellows in bearing testimony to the truly honourable and distinguished career of the Marquis of Lansdowne.

Men of letters and the cultivators of the Fine Arts have had, indeed, to deplore the loss of one who was not only their kind and considerate patron, but who was also the accomplished judge of the merits of their works. Let us, then, as followers of a branch of science which is closely allied to historical research and literature, put in our claims to say a few words in praise of a scholar who was a lover of comparative geography, and who took as lively an interest in the well-being of our Society as if he had been one of our labouring associates.

In truth, Lord Lansdowne was endowed with so capacious a mind and such broad sympathies, that he always showed the strongest desire to extend every branch of human knowledge; and seeing before me, on this occasion, various explorers of distant lands, let me say that no mansion in our metropolis was ever more freely thrown open to any distant traveller than Lansdowne House. Nor can any such traveller ever forget the urbanity with which he was received, and the tact and happy discrimination which the noble host displayed in eliciting the knowledge of his guest.

On my own part I can testify, that when (in 1840) I first went out to explore Russia and the Ural Mountains, and compare their distant rocks with those ancient formations of my own country, the order and relations of which I had elaborated, it was Lord Lansdowne who procured for me, through the Russian Ambassador, Baron de Brunnow, those credentials, without which my labours would have been in vain. This was indeed but one of the many proofs he gave me of his kindness and regard. Consistent as a Liberal in every sense of the word, and a warm supporter of his political friends, Lord Lansdowne never neglected an opportunity of doing a service to persons of merit who were of opposite politics;

* See particularly 'The Times.'

and it was in thus giving proofs of a general spirit of benevolence that he became universally beloved and respected.

As a Trustee of the British Museum, Lord Lansdowne was for many years eminently useful in the Department of Antiquities; and his advice was always sought when a union of learning with a true feeling for ancient art was required. Nor can I forget that, when all his friends in the present Government had, as his co-Trustees, come to the conclusion that it was expedient to break up the British Museum by severing from it its Natural History contents, Lord Lansdowne then, in the last year of his valuable life, qualified his unwilling assent in a letter, expressing his regret that an adequate expenditure could not have been obtained to keep united those memorials of Art, Letters, and Science in the one great and unrivalled national repository which he had so long admired.

Lastly, as a Scotsman, I have some right to be proud when I remind you that the deceased Marquis, as well as the living Premier and the Secretary for Foreign Affairs, received an essential part of his education in the University of Edinburgh; and it must, indeed, be pleasing to all my countrymen of the north to reflect that the names of Dugald Stewart and John Playfair will go down to posterity as the instructors of a Lansdowne, a Palmerston, and a Russell.

The Right Honourable Sir George Cornewall LEWIS, Bart., M.P.—I have next to record the premature decease of my eminent friend, Sir George C. Lewis, in the fifty-eighth year of his age. Receiving his elementary education at Eton, George Cornewall Lewis took the highest classical honours at Oxford. Afterwards, and under the guidance of his accomplished father,* with whom I was long on terms of intimacy, he laid in those stores of ancient lore which in subsequent years, and when the public only knew him as a statesman, enabled him to compose abstruse works, the production of which, with ordinary men, would have been incompatible with onerous official duties.† The great amount of knowledge which he had accumulated was, in truth, the result of those years of hard and patient research which preceded his being called into public life. It was this solid training which enabled him to write so many learned works, that it has been justly said of him that “he did as much in his life as twenty ordinary men, and did it well.”†

* The Right Hon. Sir T. Frankland Lewis, Bart.

† ‘The Times.’

Sir George's associates in the House of Commons and in the Cabinet in which he sat, having all testified their deep sense of the loss the country has sustained in his death, it would be superfluous in the President of this Society to enlarge on the topics by which he characterised his public career, and for which he will ever be remembered by the nation; but, as one who was proud of his friendship, I must be allowed to record my personal obligations to him.

In the year 1833, or two years only after he had been called to the bar, and before he had himself published any work, young George Lewis, then residing with his excellent father at Harpton, was so much struck with the geological observations I had made in his own county of Radnor, and in the adjacent Welsh and English counties, that he urged me to gather together and condense my materials in one large work. In a subsequent year, and after I had classified and shown the order of those ancient rocks in the old British kingdom of the Silures, under the name of "Silurian," he again urged me to write a distinct work by putting together all my detached memoirs; and thus it was that, in 1835, I announced the "Silurian System" of rocks, the large work which I completed, after seven years' labour, in 1838. I need not say that this sound advice of the thoughtful young George Lewis was of inestimable value to his older friend, and has ever since been gratefully remembered.

Whoever has had the privilege of being an inmate of the house at Harpton, whether in the lifetime of that most agreeable and enlightened man, Sir Thomas Frankland Lewis, or afterwards during the happy union of our deceased Fellow with the charming and gifted lady who mourns his loss, must have been struck with the perfect cordiality and harmony in which father and son, husband and wife, lived together; leaving in the minds of all their visitors in the vale of Radnor a souvenir never to be forgotten.

In whatever aspect we view the late Sir George Cornwall Lewis, whether as the statesman around whom as a nucleus men of all parties might have rallied in a future day; as a scholar "who might have done honour as a Professor of Greek to the most learned University in Europe;"* as a son, a husband, or a friend;—all those who knew him must agree with me when I affirm, that he was as faultless a type of humanity as any man of this generation—one of

* See Dean Milman's Preface to his 3rd edition of the 'History of the Jews.'

whom it has been justly said by a great orator of the House of Commons*—

“Justissimus unus,
Qui fuit in Teucris, et servantissimus æqui.”

Sir Benjamin BRODIE, Bart.—This remarkable man, for whom, in common with every one who knew him, I had the sincerest regard, was not taken from us until he had attained the highest distinction to which any man of science can aspire. Rising steadily in his profession by the exercise of a judgment at once quick, acute, and sagacious, combined with a happy operative dexterity, he became and long continued the leading surgeon of this metropolis. But, in pursuing his profession, Brodie never for a moment neglected the cultivation of other and higher branches of knowledge; and even at an early age he was admitted into the Royal Society, and contributed in that capacity several excellent memoirs on physiological subjects. He thus attracted the attention of Sir Joseph Banks, then the President of that body, obtained a high reputation as a physiologist, and with it the Copley medal.

Though for many years absorbed in active anatomical and surgical pursuits, he ever strove to advance the collateral sciences of Natural History and Chemistry; and, while he acted as President of the College of Surgeons, he was ever anxiously at work in promoting the completion of that grand and noble Museum, founded by his illustrious predecessor, John Hunter.

As he gradually withdrew from his active professional career, Sir Benjamin naturally went back to his early scientific love, and thereon his numerous friends and admirers fixed upon him as one who, by his attainments as well as by his honourable character, was eminently entitled to occupy the chair of the Royal Society. In that capacity he gave universal satisfaction by his courteous demeanour, while he had a pleasure in restoring to the Society a portion of the character it had when he entered it. In the days of Banks and Davy, men of any importance in public life, or of any considerable stake in the country, who though not scientifically qualified were yet lovers and supporters of science, were frequently admitted as Fellows. This system having been somewhat abused, and persons with no claims to distinction having been admitted by ordinary ballot, a great reform was called for; and it was decided that fifteen only of

* See Mr. Gladstone's Speech, May 4th, 1863.

the most distinguished men among the numerous candidates were thereafter to be annually selected by the Council. Although the working of this rule has been on the whole excellent, the good sense and right feeling of Brodie led him to the conviction that the plan was rather too exclusive; and hence he suggested the introduction from time to time of men of public distinction or utility, in addition to the exclusive selection of scientific workmen and authors.

As a Trustee of the British Museum, his sound advice was valuable on all occasions; and I had good reason for admiring the heartiness and independence of spirit with which he signed and afterwards personally supported an appeal to the Government, which I had drawn up, praying that the old British Museum might not be dislocated, and its Natural History contents translated to Kensington.

It is not to be forgotten that this eminent and good man served as a Vice-President and as one of the Council of our Society; for, amidst all his busy occupations, Sir Benjamin Brodie found time to cultivate and take much interest in geographical researches, and particularly in that branch of it which connects us with Ethnology. In every relation of life he was a model to be admired and imitated; and he so happily educated his son, that the present Baronet is now one of the leading scientific men of the day, and Professor of Chemistry in the University of Oxford.

The Marquis of BREADALBANE, K.T.—By the demise of the Marquis of Breadalbane I have lost a kind and valued friend, who, though he made no pretensions to science, delighted in associating himself with its cultivators. He was well read in mineralogy, and earned the praise of naturalists by acclimatising the animals of other countries in his beautiful grounds at Taymouth, including the Llama of South America and the Bison of the American Prairies. To him also we owe the re-introduction into the Highlands of the Caper-caillie, or Great Cock of the Woods.

In every sense of the word, Lord Breadalbane was a great nobleman; and whatever he resolved to do he did it thoroughly, and, if occasion required, magnificently. Having for many years served the Queen as Lord Chamberlain, he was as highly esteemed by Her Majesty and her illustrious Consort, as he was beloved by his friends for his fine social qualities; whilst his munificent Highland hospitality, whether at Taymouth, at the Black Mount, or on the Queen's birthday in London, will be long remembered by foreigners, as well as by our countrymen.

In 1840 he presided over the Meeting of the British Association at Glasgow; and, as I then acted under him as a General Secretary, I am enabled to testify, that, under his leadership, the men of science were most effectually supported by the nobility, gentry, and all classes of the inhabitants of Scotland.

Honest, patriotic, straightforward, and highminded in his public career, he was very sincere in his private attachments. He was, indeed, so deeply affected by the loss of his accomplished wife in 1861, that from that moment he lost, and never recovered, his wonted elasticity of spirit. He died at Lausanne, in the 67th year of his age.

The Earl of GIFFORD, though not professing to be a geographer, was greatly distinguished by distant travel. Wandering far into the higher recesses of the Himalaya Mountains, and through tracts seldom if ever before explored by Englishmen, he underwent great suffering from intense cold. Among his contributions to Natural History, it is to be remembered, that, being an ardent sportsman and a good shot, he killed in these mountains the Kiang, one of the very rare wild asses (*Equus Kiang*, or *Asinus Hemionus*, Gray), an animal not previously seen by our naturalists, and the skull and skin of which are now in the British Museum,* while a living specimen is to be seen in the Gardens of the Zoological Society.

As a member of the House of Commons, Lord Gifford was of great use in the Dockyard Commission, the masterly Report of which was written by him, and has often been referred to in Parliament, as displaying equal ability and integrity. One of his special studies, indeed, was that of Finance; and I learn from his accomplished and devoted widow, that he left behind him an unfinished financial work, to the completion and publication of

* It is also to be noted that Lord Gifford's brother, Lord William Hay, after a residence of fourteen years in the region of the Himalaya, is the person who conveyed to us the first correct intelligence concerning the fate of the traveller Adolph Schlagintweit. He also made (with the assistance of Capt. Clarke, Bengal Cavalry) the most striking photographs of many lovely scenes around Simla, including Lord Dalhousie's famous mountain-road to Thibet, as well as views of the snowy peaks of Ladak, the gorges of the Sutlej, the Valley of Kashmere, &c. The characteristic foliage of the forests of Deodora and each group of native trees, the striking and bold features of the rocks, and even the climatal conditions of warm rains and snow-clad peaks, the form of buildings, and habits of the people, are all so well brought out, that geologists, botanists, architects and engineers must unite with geographers in admiring these scenes of nature and art. It is a remarkable circumstance that four sons of the Marquis of Tweedale should have traversed the Himalaya to the plains of Thibet, viz., the late Lord Gifford; Lord Arthur (now Lord Walden), who brought home many new species of birds; Lord William, as above; and Lord Frederick, who killed many of the wild horses mentioned in the text.

which she had looked forward with sanguine hope and pride, as calculated to make his talents known to the world in the most useful and worthy form.

Lord Gifford was not only a good mechanic, he was also a sound mathematician and a scientific musician, having written a treatise on Counterpoint at the age of twenty. His appreciation of the Fine Arts was intense; and he had such a facility for modelling, that, if born in a humble walk of life, and not as heir to a marquise, he unquestionably would have been eminent as a sculptor.

Dexterous in every manly exercise, he lost his life through his energy in sustaining a heavy mass of wood, from which some workmen whom he was directing had loosened their grasp, thus suddenly throwing a vast weight upon him. The inflammation occasioned by this accident led to an illness of sixteen months' duration, of which he died on the 22nd of December last, in the fortieth year of his age.

All the friends of Lord Gifford (and I am proud to have been of that number) know well, that an ingenuous simplicity was combined in him with the clearest intellect and the kindest disposition; whilst, in addressing geographers, I can assert, that the explorers of difficult and inaccessible regions have, by his death, lost a truly distinguished rival.

The Earl of ELLESMERE.—Six years, alas! only have elapsed since it was my painful duty to recount to this Society* the merits of my gifted friend, one of our former Presidents, the first Earl of Ellesmere. His successor, the young Earl, who has since passed away, was so infirm in health when he succeeded to his title, that a long life could scarcely be hoped for him. Though little known in public life, I am bound, however, to say of him, that he was a good scholar, a sound mathematician, and that he felt real pleasure in taking his place in the Royal Society, as well as in our own body. He also proved himself to be a son worthy of his accomplished parent as the patron of the Fine Arts, and as a great landed proprietor he sought to promote the good of all around him.

Lucas BARRETT.—Geography is too intimately linked on to Geology to allow me to pass over the name of young Lucas Barrett, who, though cut off at a very early age, had already risen to distinction, and was Director of the Geological Survey of the West Indies. A pupil of Professor Sedgwick, he earned the full approba-

* See Obituary, Vol. xxviii.

tion of that eminent man by his skill as a palæontologist, and the able manner in which he classified and arranged the Woodwardian Museum at Cambridge. Having published several papers showing great acumen, he was, on the retirement of Mr. Wall, appointed Director of the West Indian Geological Survey. In that situation he displayed both vigour and ability, and, by his acquaintance with fossil remains, was enabled to show that the copper ores of Jamaica occurred in rocks no older than the chalk of Europe—a fact previously unknown. The Geological Map and Sections of Jamaica, which he exhibited at the late International Exhibition, and which his associate, Mr. Sawkins, and himself had prepared, were honoured with a medal. On returning to his post in Jamaica, he took with him a new diving apparatus to dredge for marine animals, and, through some maladjustment of the safety cord, he unfortunately perished when making his first trial; leaving a widow to lament the untimely end of this highly-gifted and promising young man of science.

Mr. James Robert GOWEN, who died since our last anniversary, was an intelligent Fellow of our Society. In addition to his fine temper and amiable social qualities, he had the merit of being the first of our body who recommended the employment of camels in the exploration of Australia; and, as was shown in the article on Australia in the President's Address of last year, it was by such means that the northern sea was first reached from South Australia and Victoria.

MR. WILLIAM JOHN BURCHELL.—By the death of Mr. Burchell we have lost a venerated representative of the early race of South African travellers, as it is forty years since he undertook extended journeys into the Hottentot districts north of the Cape. He was an assiduous collector and a careful observer; and his narrative may be ranked among the classics of English travels, from its simple, vigorous, and truthful style, and its numerous illustrations, made with scrupulous fidelity on wood and stone, by his own hands.

By the decease of Mr. CHAMBERS, of Adelaide, the promotion of Australian surveys has suffered a great loss. Though not a man of science himself, he was the patron and employer of M'Douall Stuart. And if it be suggested that such an employment of our Medallist was chiefly caused by a desire to acquire new lands, may I not reply that it is by such bold and riskful methods of spending their capital—a boldness which is peculiarly characteristic of the Anglo-Saxon race—that Geography owes many a bright discovery and Commerce many

a useful end? In his employment and fitting out of Stuart, and from the manner in which he transmitted all information to this our Geographical Society, Mr. Chambers has shown much liberality, as well as his surviving partner, Mr. Finke.

Mr. EDMUND GABRIEL.—All those who take an interest in the suppression of the slave-trade will hear with regret of the death of Mr. Gabriel, Her Majesty's Judge in the Mixed Commission Court at St. Paul de Loanda, West Coast of Africa. Mr. Gabriel had been connected with that coast for many years, and was perhaps as instrumental as any man of his time in putting down the nefarious traffic. The son of a naval officer, Mr. Gabriel entered his father's profession at an early age, and served for seven years in the African squadron, twice filling the position of Secretary to the Commander-in-Chief on the station. In this capacity he acquired a perfect knowledge of the slave-trade in all its bearings. Early in 1845, his distinguished talents and zeal brought him under the notice of the late Earl of Aberdeen, then Foreign Minister, who selected him to fill, at the early age of twenty-one, the important post of Arbitrator and Acting Judge at Loanda. His energetic administration of this office was appreciated by the Liverpool merchants, who tendered for his acceptance a costly piece of plate, as an acknowledgment of his efforts for the protection of British shipping; but Mr. Gabriel, with his characteristic high-mindedness and delicacy, declined the valuable gift, remarking that he had only done his duty, and that it was not consistent with the office of a Judge to accept a present. Another very characteristic circumstance is recorded of him in Dr. Livingstone's well-known volume. When that great explorer, having crossed the African continent, reached Loanda in May, 1854, worn out by fatigue and sickness, he presented himself without introduction at the hospitable door of Mr. Gabriel, who immediately gave up his own bed to the sick and unknown stranger. Dr. Livingstone bears grateful testimony to the generous kindness of this "genuine, whole-hearted Englishman," in whose house he and his twenty Makololos found a home for many months.

In urging on the House of Lords (1861) the desirableness of re-appointing a Consul at Mozambique, with a view to the suppression of the slave-trade on the east coast of Africa, Lord Campbell passed a well-merited eulogy on the character of our deceased associate, Mr. Gabriel, pointing him out as the man of all others most capable of checking the slave-trade in that foreign colony. It was on that occasion said of him, with justice, in reference to his career at Loando, that, "during a period of fifteen years, the volumes on

the slave-trade abound with proofs of his tact, judgment, public spirit, and intelligence."

We have only to add that Mr. Gabriel eventually fell a victim to the deadly influences of the climate, operating on a constitution impaired by the hard work of seventeen years. He died on board *H.M.S. Torch*, having gone afloat in the hope of recovering his health. After his death the vessel returned to Loanda, where his remains received the honours of a public funeral; the Viceroy, and other foreign authorities, with the inhabitants of the place, joining with his own countrymen in this mark of regard, the universal sentiment being one of deep sorrow for his early death.

Among the other Fellows of the Society who have passed away, I must mention, as personal friends whose loss I lament, Mr. James Walker, F.R.S., the eminent and well known Civil Engineer, whose valuable labours will be recorded in the proceedings of other societies; Mr. Antony St. Leger, an accomplished and most agreeable gentleman; and the amiable Mr. Walter Ewer, a skilful Orientalist and an accomplished civil functionary of our Indian Administration.

The remainder of the mournful list is made up of the names of Mr. David Barclay; Mr. George Smith Brent; Mr. John Costerton; Major-General John Fraser; Lieutenant-Colonel C. Fagan; Mr. George March Harrison; Mr. W. Jackson; Mr. Charles Hammersley; Mr. E. B. Lawrence; Captain Liardet, R.N.; Mr. H. Tanner, of Philadelphia; Mr. Francis Nares; Vice-Admiral A. Vidal (a distinguished officer); and the coloured Missionary, Mr. Hanson. The last-mentioned of these addressed us on African subjects in relation to the slave-trade and the new settlement at Liberia, with much feeling, and in good and racy English.

Mr. WHEELER, our first clerk, who died recently, was a great loss to the Society, and many of our Members have very properly subscribed to assist his widow and young children.

The different subjects of the Address which follow will be given in much the same order as in previous years. Beginning with the Admiralty Surveys, as furnished by our esteemed associate Admiral Washington, the Hydrographer, and succeeded by the national Topographical and Geological Surveys, the account of the progress of exploration in Africa and Australia will form the main features of this discourse. Brief sketches of the progress of Geography in Germany, more particularly as gathered from the publications in

the 'Mittheilungen' of Petermann, will be associated with communications on Asia, Japan, and Greenland, and some general observations on the present and former conditions of the northern regions of Europe, to show the intimate connexion between geological and geographical science.

Commenting very briefly on a few publications of books and maps in our own country, I will defer till the ensuing Anniversary any further observations on them and on the advance of our science in Russia and America. Nor will I till then attempt to take a general retrospective view of the progress of our own labours. On this occasion I will conclude with a few observations on the changes which have just taken place in the administration of our affairs.

ADMIRALTY SURVEYS.

The Coast Surveys in course of execution under the orders of the Admiralty, both at home and abroad, have made the usual progress during the past year. They are conducted by twenty different parties, one-half of which are employed in the United Kingdom; the remainder in the colonies of Australia, Cape of Good Hope, West Indies, Nova Scotia, Newfoundland, and Vancouver, and also on the foreign coasts of Syria, Saloniki, China, and Japan.

The British Isles. England.—The Coast Survey of the British Isles is nearly complete; but from the nature of the shores, particularly on the east coast of England, in the estuaries of the Humber and Thames, in Yarmouth Roads, the Downs, and other places subject to the accumulation of sands, changes will ever be taking place that will require watching and re-examination.

The South Devon Survey has been brought to a close, under Capt. Stokes, R.N.; and the re-examination of the Scilly Isles, by Capt. Williams, R.N., and of the Channel Islands, by Mr. Richards, R.N., is proceeding steadily. In the latter group, so beset with rocks and hidden dangers, a very critical search is required; and the careful system carried out by Mr. Richards has been rewarded by the detection of several shoals that had escaped the cursory method of previous surveys.

In South Wales, Commander Aldridge and staff have surveyed 40 miles of coast-line, besides 20 miles of sward or marsh outline, together with about 100 miles of low-water feature, and 108 square miles of soundings.

Mr. Calver, R.N., and party have finished the upper Humber, and re-surveyed a considerable portion (120 square miles) of the southern

entrance of the Thames. They were also engaged in making a series of observations on the tidal streams off Dover, with a view to assist the solution of the much-contested problem of the locality of Julius Cæsar's landing on our shores.

Mr. Scott Taylor, R.N., has continued his delineation of the several changes in progress in the vicinity of Portsmouth and the Isle of Wight.

Scotland.—Captain Otter and his assistants have been engaged in the survey of the islands of South Uist, Canna, and Rum, and have sounded over an area of 1182 square miles. Commander Thomas has continued his survey of the intricate shores of Benbecula and Harris, of which he has delineated 113 miles of the labyrinthine shores occupying a comparatively small area, and has sounded 246 linear miles in boats; while Commander A. G. Edye has surveyed 62 miles of the exposed islands of Barra, Muldoanich, Flodday, Pabbay, &c., as also the dangerous submerged rocks adjacent.

Commander (now Captain) E. J. Bedford and staff have surveyed 97 miles of the coast line of Lochs Linnhe, Leven, Etive, and Iel, and 107 square miles of adjacent topography, together with 194 linear miles of soundings.

Ireland.—Messrs. Hoskyn and Davis, R.N., were employed during a portion of the season in obtaining deep-sea soundings off the Western coast in H.M.S. *Porcupine*, for the purpose of determining the best route for the electric cable to America, should that gigantic and much-to-be-desired enterprise be again attempted; and which the indomitable energy and perseverance of English and American capitalists and engineers will doubtless undertake and accomplish; either by the direct route from Ireland to America, or by the more circuitous connexion of Færøe, Iceland, Greenland, and Labrador. This examination of the bed of the Atlantic to a distance of about 200 miles from the coast, has revealed some remarkable irregularities of contour; and among them is that of the Porcupine Bank, having a depth of only 82 fathoms at a distance of 180 miles west of Slyne Head. A line of soundings was also carried to the extensive and prolific, but, as appears from recent accounts, very uncertain fishing-bank, from which rises the remarkable and almost inaccessible lump of granite, "Rockall," to a height of 70 feet above the level of the sea, where its base is only about 250 feet in circumference. (Lat.: 57° 35' 53" N., 13° 42' 21" W.) Mr. Hoskyn's survey has added some interesting facts in microscopic life, and also some species of shells and other animals new to British Fauna.

Mediterranean.—Captain Spratt, R.N., with his staff, in the *Medina*, have during the past year completed an admirable survey of the Maltese Islands, with their surrounding depths. This has been charted on a scale of $1\frac{1}{2}$ inch to a nautic mile, and is already in the engraver's hands. They have also delineated the shores of the Gulf of Saloniki, and obtained lines of deep-sea soundings through the Archipelago. Elaborate surveys have also been made of French Creek, and portions of Grand Harbour, Malta, on a scale of 60 inches to the mile, for engineering and other special purposes.

Commander Mansell and his staff, in the *Firefly*, have completed the coast of Syria, forming a junction at El Arish with his previous survey of the coast of Egypt. An extensive triangulation has been carried across the mountain ranges, by which the connexion of Damascus, and the chief points of interest along the valley of the Jordan, with the shores of the Mediterranean have now been accurately established. Commander Mansell has now commenced the re-examination of the channels of Corfu, which is much required.

Africa.—In the Cape Colony Mr. Francis Skead, R.N., has made a survey of Mossel Bay and adjacent coast, on a scale of 4 inches to a nautical mile, and has extended his triangulation for future observations.

Asia.—Along the Mekran coast of Persia, Lieut. A. W. Chitty, L.N., has closely sounded between Ras Jashk and Ras Gwadel to distances varying from 10 to 20 miles from the shore, where the depths are from 200 to 400 fathoms.

Lieut. Stiffe, L.N., also obtained some additional soundings in the Persian Gulf, and examined various portions of the coast to determine the best stations for the telegraph-line which is to connect this country with our Indian empire, by route of Constantinople, Bagdad, and the Persian Gulf.

A plan of Bushire, by Commander C. G. Constable and Lieut. A. W. Stiffe, L.N., has recently been published by the Admiralty, on a scale of 3 inches to the mile.

China and Japan.—In the course of the preceding year H.M. ships *Rifleman* and *Swallow* left England for the survey of the China and Japan Seas. Mr. John W. Reed, Master, R.N. (commanding the *Rifleman*), and his staff, have already transmitted a good instalment of work, in the surveys of the Tambelan and St. Esprit groups, and the surrounding islets and rocks lying between Singapore Straits and Borneo. Meridian distances have been run between these islands, Singapore, Saigon River, and Pulo Condore; Charlotte

Bank examined and its position accurately determined; while the reported shoal Capiolani, lying (as well as Charlotte Bank) directly in the route between Singapore and Hong-kong, was sought for in vain. From evidence obtained relative to this supposed danger, it seems more than probable that the captain of the *Capiolani* was deceived in what he saw. The next work of the *Rifleman* will be the survey of Pulo Sapato, Catwick, and the several dangers lying to the south-east of Cochin China, in the high road of commerce, and from thence proceed to explore and define the numerous reefs that stud the China Sea between those and the coasts of Borneo and Palawan, one-half of which, as they now appear on the chart, are probably fabulous, so that the importance of establishing what really do exist in this much-frequented route cannot be overestimated.

Mr. Edward Wilds, Master, commanding the *Swallow*, with his staff, have carried meridian distances to Singapore, to Pulo Condore, Sapato, Hong-kong, and Shang-hai, and resurveyed the shallows of Wu-sung River, leading to the last-named place. The *Swallow* is now engaged in the Japan Sea.

During the season of 1861 H.M. ships *Actæon* and *Dove*, Commander Ward and Lient. (now Commander) Bullock, R.N., were given the assistance of the *Leven* and *Algerine* gun-vessels, in their surveying operations in Japan, by order of Sir James Hope, K.C.B., the Naval Commander-in-Chief on that station.

The approaches to Yedo, extending from Cape Idzee to Cape King, an extent of 150 miles, and embracing the Bay of Wodewara and the Gulf of Yedo, have been surveyed on a scale of 1 inch to the mile, and a chart of the latter, including the joint work of American, Prussian and Dutch surveyors, has been published on the same scale. The chain of islands, extending about 3° south of the Gulf, has also been partially explored as far as Tatsizio, a large island which is said to be a penal settlement, and inaccessible except at one spot. Additional observations were made on the Kuro-Siwo, or Gulf-stream of Japan, which has been here found to recurve to the southward in the summer months, contrary to the generally received opinion.

At Yedo a manuscript survey of the empire, on a scale of 10 inches to a degree, was obtained from the Government through the instrumentality of Mr. (now Sir) Rutherford Alcock, K.C.B., our minister there. This acquisition is valuable not only as a correct map (for wherever tested it has been found to be both trigonometrically and astronomically accurate to a remarkable degree, although graduated

in a peculiar and original manner), but also as a work of art, illustrating the advanced stage attained by this extraordinary people in surveying, which will compare favourably with specimens of our own, published in the beginning of the present century. From this manuscript a new general chart of Japan has been published, on a scale of 2 inches to a degree of longitude, also a chart of the inland sea of Japan, on the scale of the manuscript, with soundings obtained by several of H.M. ships, by which, at the cost of a few days, this intricate labyrinth of rocks and islands is made plain to navigators, which otherwise would have occupied the surveying party a year. The approaches to this sea, embracing about 220 miles of coast-line, have been surveyed by Captain Ward and his staff, on a scale of 1 inch to the mile, and plans of several harbours on the shores of the Eastern or Kii Channel, on the 3-inch scale.

A new survey has also been made of the important harbour of Nagasaki, with that of the adjacent coast as far as Cape Nomo. All of which are in course of publication. The eastern sound of Tsushima and the southern part of the island have also been surveyed; whilst the northern portion of the hitherto unexplored arms of Tsushima Sound have been executed by the Russians, who have also roughly charted the island of Iki.

The depth of the Korea Strait has been ascertained, and the southern part of Goto Islands surveyed, where a fine harbour, called Tama-no-ura, has been discovered. Also a portion of the Korean Archipelago and coast opposite Tsushima, has been explored, by which it is thrown 20 miles to the westward of its assigned place on the chart.

A track survey, by Lieutenant Bullock in the *Dove*, was made of 100 miles of the south coast of the province of Shan-tung in China, from the parallel of $36^{\circ} 40'$ N. to within 60 miles of the old entrance of the Yellow River, which is now reported, with scarcely any doubt, to discharge itself into the Gulf of Pechili by the Ta-tsing-ho, a river known to have been gradually increasing its volume for three or four years; and by the destruction of the vast embankments that had confined it to its southern channel, it has resumed the old course in which it had previously flowed (though with frequent fluctuations) for centuries; thus realizing the prediction of Mons. Biot, made but twenty years since. Off the now dry southern mouth of the Hwang-Ho, its sands were found to stretch seaward 100 miles, rendering it dangerous for large ships to approach the coast even at this great distance.

The question of the geographical distribution of species has been advanced by the valuable collections and observations made by the eminent naturalist Arthur Adams, F.L.S., who was Surgeon of the *Actæon*. Mr. James H. Kerr, Master, R.N., with Messrs. Adlam and Dowdale, R.N., were detached from H.M.S. *Actæon* to survey the western branches of Canton River, of which they delineated upwards of 200 miles.

Australia.—The Australian Surveys, at the joint expense of the Admiralty and the Colonies, are progressing steadily; Commander Cox, R.N., and staff have nearly completed that of the noble inlet of Port Phillip, on a scale of 6 inches to a mile, a portion of which is now being engraved on the 1-inch scale.

Commander Hutchinson, R.N., and party have transmitted their survey of the upper inlet of Spencer's Gulf leading to Port Augusta (embracing about 100 miles of coast line), on a scale of 3 inches, with a plan of the port on 9 inches to a mile; a reduction of which will shortly be published; while their chart of the mining district of Wallaroo and Tipara Bays has already been issued.

Commander Sidney, in New South Wales, has transmitted home 50 miles of coast between Crowdy Head and Sugar Loaf Point, and also corrected the chart of Newcastle Harbour to its present condition.

Mr. Jeffery, R.N., who went out at a later period to the survey of the coast of Queensland, is engaged in the survey of the channel within Great Sandy Island.

In Tasmania Lieutenant Brooker, R.N. has made a survey of the Port of Hobart Town, which has been published on a scale of 10 inches to a mile; and also of George's Bay, on the east coast; but we regret to state that his further progress has been cut short in consequence of the finances of the colony being for the time incapable of bearing the moiety of the expense which it had agreed to share with the Admiralty.

Vancouver Island.—Through the indefatigable exertions of Captain G. H. Richards, R.N., and his staff in H.M.S. *Hecate*, the entire survey of this extensive island has now been completed, together with the strait separating it from British Columbia, with most of the inlets that deeply indent the latter. Captain Richards is now returning home, but has organized a party who remain behind to continue the exploration of the coast of British Columbia. A series of eight charts, on the scale of $\frac{1}{4}$ an inch to a mile, will embrace the entire coast of Vancouver; half of which, together with several

enlarged plans of harbours, have already been published. Much credit is due to those who have effected the able and rapid execution of this highly useful survey.

Newfoundland.—The survey of this island, on a scale and system corresponding with the requirements of the present age, is proceeding steadily under Captain John Orlebar, R.N. and staff. The portions of the coast of Trinity Bay lying between Catalina Head and Horse Chops on the west side, and between Baccalieu Island and New Perlican on the east side; also in Conception Bay from Baccalieu to Carbonière, and from Portugal Cove to Cape St. Francis, and thence to Cape Spear, together with Bell and Kelly Islands, have been surveyed on the scale of $\frac{1}{4}$ an inch to the mile, while plans of Catalina, New Perlican, Harbour Grace, and St. John Harbours have been plotted on 3 inches to the mile. On the south coast the Bay of St. Mary, and the harbours within it, have been completed, altogether embracing 370 miles of coast line, added to which upwards of 2000 square miles have been sounded, extending eastward from the coast to the meridian of 50° West. The explorations in Trinity and Conception Bays, and the examination of the sea-bed in their approaches, were made more especially to determine the best point for landing the American end of the Great Atlantic Telegraph, which, it is to be hoped, will soon connect that country with Great Britain and Europe; and Captain Orlebar has reported that New Perlican, on the eastern side of Trinity Bay, seems to be best adapted for this purpose. For the laying of the first cable you may remember that Bull Bay, in the south-west angle of Trinity Bay, was the place selected for its western terminus.

Nova Scotia and Bay of Fundy.—Captain P. Shortland, R.N., with his staff, have mapped 162 miles of the south-east coast of Nova Scotia, on a scale of 4 inches to a mile, and sounded over an area of 282 square miles. Charts of the upper portion of the Bay of Fundy, embracing the Basin of Mines, and the Petitcondiac River and Cumberland Basin, as also of the south-east coast of Nova Scotia from Baccaro Point to Rugged Island, are about to be issued to the public.

West Indies.—The surveying party under Mr. John Parsons, Master, R.N., have completed about 70 miles of coast line of the Grenadines, St. Lucia and St. Vincent, and elaborately and closely sounded over 180 square miles. Plans of Admiralty Bay, in Bequia Island, and Kingston Bay, in St. Vincent, have been made on a scale of 20 inches to a mile, and of Castries Port in Santa Lucia on

15 inches, and very thickly sounded. Mr. Parsons is now engaged in an elaborate survey of Falmouth Harbour, Antigua, on a scale of 30 inches; this port having been selected as a packet station for the West India line.

Besides the works here described as in progress in the different parts of the world, the labours of the Hydrographic Office during the past year have consisted of the publication of 65 new charts, with material additions and corrections to many others, under the immediate superintendence of Captain George A. Bedford, R.N. It will give some idea of the activity of the business of this office when I state that 138,503 Admiralty Charts have been printed during the year ending 30th April. There have also been published the usual Tide Tables for 2500 places, by J. Burdwood, Esq., R.N., the Light Lists for every coast by Commander E. Dunsterville, R.N., together with Hydrographic notices of new lights, rocks, and shoals discovered, and other information essential to navigation in general:

ORDNANCE SURVEY.—I learn from my friend Colonel Sir Henry James, under whom this important branch of material scientific labour is so efficiently conducted, that the survey of Northumberland and Cumberland has been finished within the last year, and the plans of those counties are now in course of publication. By this operation the survey of England and Wales is completed so far as relates to the one-inch map of the whole country. It also completes the survey of the six northern counties, viz. Northumberland, Cumberland, Westmorland, Durham, Yorkshire, and Lancashire, on the twenty-five and six-inch scales also. The plans of these counties have been made as *cadastral surveys*,* the universally received name for plans on a large scale strictly accurate in all respects.

The survey of these counties having been on the eve of completion, a Select Committee of the House of Commons, of which Viscount Bury was Chairman, was appointed last session to report upon "the expediency of extending the Cadastral Survey over those portions of the United Kingdom that have been surveyed upon the scale of one inch to the mile only;"† and this Committee having reported "That it is desirable that the Cadastral Survey, on

* From the French "*cadastra*," survey.

† Whilst such are the facts, I must repeat the expression of my hope that these surveys on the large scale will not be applied to the wild and mountainous regions of the Highlands; a one-inch map of which is all that can be desired, whether for proprietors, engineers, or geographers.

the scales directed by the Treasury Minute of the 18th May, 1855, and recommended by the Royal Commission of 1858, and again directed by the Treasury Minute of the 11th September, 1858, be extended to those portions of the United Kingdom which have been surveyed on the scale of one-inch to the mile only;" and in consequence of this recommendation, a Treasury Minute of the 18th March, 1863, has been issued, directing that arrangements should now be made for carrying this recommendation into effect, and the measure has since received the sanction of Parliament. We shall therefore have a complete cadastral survey of the United Kingdom; that of the whole of Ireland having been already published on the six-inch scale, that of Scotland having been finished from the southern border so far north as to include the whole of Perthshire, parts of Kincardineshire and Argyleshire, and the survey is now proceeding in the two latter counties and in Aberdeenshire. The six northern counties of England have also, as before stated, been surveyed for the twenty-five and six-inch scales; and by the foresight of the late Lord Herbert the military surveys along the valley of the Thames from Kingston to below Sheerness, of large districts round Portsmouth, Devonport, Pembroke, Dover, and other places, were made as parts of a complete cadastral survey of the counties in which those places are situated. This was a most fortunate arrangement; a great number of the plans are already finished, and the publication of them is now in progress.

A complete catalogue, in three parts, of all the maps, plans, and works published by the Ordnance Survey Department relating to England, Ireland, and Scotland, will be found in the library of the Society; and this catalogue will be reprinted and issued quarterly.

The account of the extension of the triangulation of the United Kingdom through France into Belgium has been published within the last year; the Belgian geometricians are connecting their triangulation with that of Prussia, and the Prussian geometricians are connecting theirs with that of Russia, whilst the Russians are extending theirs as far as Ursk on the river Ural; and M. Otto Struve states that he hopes to have this portion of the work finished next year. We shall then have the data for computing the length of an arc of parallel in latitude 52° N. from Valentia in the west of Ireland to Ursk, extending over nearly 75 degrees of longitude.

In order that the lengths of the computed sides of the triangles in each country and the whole length of the arc should be accurately given in terms of a common unit of measure, a rigorous

comparison must be made between the standard of length used in each country for the measurement of their respective bases, and this comparison is now being made at the Ordnance Survey Office, Southampton. The difference in the computed lengths of the sides in our extended triangulation and the lengths as computed by the Belgian engineers is less than one foot in 10 miles, or less than the $\frac{1}{100000}$ part, but this result may be modified when the standards of length are compared.

The whole of the volume called 'Great Domesday Book' has been copied at the Ordnance Survey Office by the photo-zincographic process applied by Sir Henry James, and the second volume called 'Little Domesday Book,' containing most minute entries respecting the counties of Essex, Norfolk and Suffolk, is now being published; and it is in contemplation to add to these volumes maps of each separate county, showing the position of the several manors mentioned in Domesday Book, with the names by which they were known in the time of the Conqueror and their modern names.

The art of photo-zincography has been greatly advanced within the last few months; for whilst it was previously confined to the production of copies of existing documents, such as MSS., printed works, and line engravings, it is now employed at the Ordnance Survey Office for the production of copies of photographs in permanent ink, and at a very trifling expense. This art is therefore likely to prove of the greatest advantage to travellers, as photographs can now be sent or brought home, and prints to illustrate the account of their travels struck off from zinc plates or stone in any number that may be required.

GEOLOGICAL SURVEY OF THE UNITED KINGDOM.—The report of the last year's progress, which it has been my duty to make as Director-General of this establishment, contrasts favourably with that of the preceding year. Thus, the survey of Great Britain, under the management of Professor Ramsay, has extended over the Wealden country of Kent and Sussex and various midland counties, and has been extended northwards into Staffordshire, Derbyshire, Cheshire, and Lancashire. Again, sheets on the six-inch scale have been published of the last-mentioned county to show in detail the "faults" and complications of the coal-fields. Maps and sections on the same large scale have been finished in illustration of the carboniferous rocks of Scotland. The sale of all these maps has greatly increased.

The survey of Ireland under Mr. J. B. Jukes has also made good progress in the following counties—Queen's, King's, Clare, Galway, Longford, and Westmeath. The published sheets of the map now amount to 93 out of the 205 sheets into which Ireland is divided.

On the affiliated branches of this establishment, which it is my province to direct, it is unnecessary that I should dilate in a geographical discourse. I may, however, say with some pride, that the eminent professors of the Royal School of Mines have educated many promising youths in chemistry, metallurgy, physics, mechanics, and natural history, as well as in geology, mining, and mineralogy. The Mining Record Office, also an integral part of our system, and which is zealously conducted by Mr. Robert Hunt, has proved most serviceable to the Houses of Parliament and the nation in registering the mineral produce of the kingdom. These documents are not only important to the mining, commercial, and manufacturing interests of the country, but are highly appreciated by all foreign statisticians. Restricting my observations to the Geological Survey only, and the publication of our maps, it has naturally been a subject of great satisfaction to myself, that our labours should have been highly esteemed by geographers and geologists of all nations who attended the late International Exhibition. I may, indeed, particularly cite the opinion of M. Sella, a sound mathematician, and recently Minister of Finance of the kingdom of Italy, who having been officially employed to visit the mining schools and geological surveys of various countries, with a view to the application of the best system to Italy, thus reports upon the operations of our British survey:—"England is, without doubt, the country where geological maps are prepared with much greater accuracy than in any other land. The singular importance of her mining industries, the spread of the elementary principles of geology, the zeal of the geologists charged with these labours, and the precision of their works have been so carried out, that few undertakings of the British Government have so much contributed to the benefit of the public as the Geological Survey of the United Kingdom."

Recent British Publications.—I must defer till next Anniversary, notice of the recently published works. I may, however, notice 'The Introductory Text Book of Physical Geography' of Mr. David Page, as being most useful to young geographers, and scarcely of less value to many of my older associates, in bringing before them

in a clear and condensed form all the leading elements of geographical science.

For the small price of two shillings, any Fellow of our Society can provide himself with a copy of this work, which, illustrated by many diagrams, conveys to the student and brings back to the mind of the proficient all the chief data, whether astronomical, geological, or meteorological, by which the outlines of the crust of the earth are determined. The author has, indeed, particularly pleased me by showing that the changes of land and water can only be well understood by the explanations which geological researches have revealed. In addition to a clear sketch of the effects of climatological influences, he points out the nature of the distribution of plants and the lower animals, and also describes the races and varieties of man, and his advancement through the means of civilisation and culture.

In short, by the manner in which he connects Geography with Ethnology, Mr. Page affords the best possible reason for the union of these sciences; and, as it fell to my lot to bring about that union in one of the Sections of the great national meeting of the British Association,* so I am the more gratified in perceiving that Mr. Page has based these, the last arrangements of matter and life on the surface of our planet, on their true foundations, and has thus connected them with the numerous previous changes which the earth has undergone.

I also refer my associates with much satisfaction to a still smaller, but not less important work in awakening the mind to the harmonious adjustments of Nature. In his Essay on 'The Correlation of the Natural History Sciences'† Professor Ansted has eloquently and clearly shown, in 50 small pages, that Physical Geography, General Physics, Chemistry, Astronomy, Zoology, Botany, and Geology are all correlative—all demonstrative of the marvellous unity of design of the Creator.

In reference to the maps recently published in the British Isles, I must also defer any comment on them to the ensuing Anniversary.

Geographical Publications in Germany.—The zeal with which geographical works, not merely relating to their own country but to the world at large, are issued by Germans is truly remarkable. I

* The Geographical and Ethnological Section.

† MacMillan and Co. 1863. Price 1s.

cannot now pretend to notice the very numerous publications and maps which have issued from Vienna, Berlin, and the smaller cities of Germany. Of the latter, however, Gotha has been rendered so celebrated by the 'Mittheilungen' of Justus Perthes, so ably edited by Augustus Petermann, and so extensively circulated through Europe, that I deem it to be highly useful for geographers to have thus placed before them (as below)* a list of the

* The following are some of the original papers contained in the 'Mittheilungen' for 1862-63:—

EUROPE.—*E. v. Sydow*, Report on the Progress of the great National Surveys of the European States in 1861 and 1862 in particular, and of recently published maps in general. *A. Petermann*, on the English Admiralty Survey of the Western Coast and Islands of Scotland (with map). *A. Petermann*, on the Cartography of Denmark and the Duchies, and her Colonies in Iceland, Greenland, Færøe, and the West Indies (with map). *General Blarumberg*, Director of the Imperial Russian Ordnance Office, Cartography of Russia in 1862. *General Chodzko*, the Russian Surveys in the Caucasus. *Captain Zwashintsoff*, Russian Survey of the Caspian Sea (with map, showing the soundings by blue tints, from 100 to 100 sashes, and representing two great depressions of the sea-bottom of upwards of 400 sagues); Measurement of the Arc of the Meridian between Palermo and Christiania. *L. v. Babo*, on the Wine-Growing Districts of Germany, and the characteristic features of the different kinds produced. *Professor Rogg*, physico-geographical essay on the Basin of the Boden-See. *Lieut.-Colonel Sonklar*, the Alpine Group of the Hohen Tauern. *Coaz*, the Alpine Passes of Graubünden, and the Railway between Switzerland and Italy. *Dr. A. Fieber*, the New Administrative Division of Austria (with map). *J. Schmidt*, Director of the Observatory at Athens, Travels in Greece, and Hypsometric Measurements. *V. Baer*, the project of the Manytsh Canal. *Magister v. Seidlitz*, Journeys in the Caucasus, 1862.

ASIA.—*Berghaus*, the Present and Future Lines of Communication between Europe and India. *Dr. Th. Kotschy*, Journey to Cyprus and Asia Minor, 1859. *Dr. O. Blas*, Journey in Asia Minor and Kurdistan, 1857; and on the Orthography and Meaning of Turkish Names of Places in Asia Minor. *Dr. A. Schläfli*, Ethnography of Kurdistan and Mesopotamia; and the Political Condition of the countries round the Persian Gulf. *Julius*, Survey of *Captain Selby* and *Lieut. Collingwood* of Lower Mesopotamia, by order of the Bombay Government (with map). *Maximowitch*, Journey on the River Sungari, in Manchouria, 1859. *Chalmers and Hawk*, Journey on the Tong-kiang or East Canton River, 1861. *E. v. Richtshofen*, Journey in Siam and Pegu, 1862.

AFRICA.—*A. Petermann*, Map of the Interior of Africa, in 10 sheets. (This map extends from Cairo in the north to Kazei and Lake Tanganyika in the south, and from Karthum on the east to Lake Tsad on the west; it has been constructed with great care and labour from published as well as manuscript materials: hundreds of works and papers having, I understand, been consulted. Of this extensive work, 8 sheets are now published, accompanied by seven memoirs, which have been selected from among the unpublished materials consulted in constructing the map. These are *M. v. Beurmann's* Journey through the Nubian Desert, 1860; *Dr. Th. Kotschy's* Journey in Kordofin, 1859; *Brus Rollet's* Journey in the Marshy Regions of the Bahr el Abiad and Bahr el Gazal, 1856; *Dr. E. Behm*, the Eastern Portion of the Desert of Sahara, including the Country of the Tebu; *M. v. Beurmann's* Journey from Bengazi to Murzuk, 1862; *Marguis O. Antinori's* Journey from the Bahr el Gazal to the Country of Djur, 1860-61; and *M. v. Beurmann's* Journey from Murzuk to the East into the country of the Tebu, 1862. The two last sheets, 8 and 9, are in the press, with an original paper by *Heuglin*, on the Upper Blue Nile and its Tributaries; as well as a memoir by the Missionary *Martang* on his journeys to the East and West of Gondokoro, 1859.)

I further learn from Mr. Petermann that reports have been made on the journeys and observations of Messrs. Heuglin, Heudner, Kinzelbach, and Munzinger, in the regions of Eastern and Inner Africa, extending from Juakin in the North, southwards through Abyssinia to near the 10° of N. lat., and from Massuah in the East to Kartum and El Obeid in the West. (Eight valuable maps of this region, with astronomical positions and observations

various papers and maps issued by that establishment in the past year. In addition to this copious list, I must call attention to a new edition of 'Stieler's Atlas,' in 80 sheets, which Petermann is engraving on copper, in order to render them more clear and distinct than any lithographic map can be made. The specimens of these sheets which I have received, illustrative of Great Britain and Ireland, Denmark and her Colonies, Upper Italy, Australia, West Australia, Tasmania, and New Zealand, are much to be commended. Supplementary to Stieler's Atlas, our indefatigable German associate is preparing a still larger series of 300 sheets. His idea is to supply in full and careful delineation all those details which are inadequately represented, and on too small a scale, in most existing Atlases. Thus Australia will be represented in 25 sheets. Another and well-executed map of Petermann's is the Geological Map of the Province of Auckland, in New Zealand, as prepared on the spot by our distinguished friend, Dr. Hochstetter, of the Austrian *Novara* expedition. This author has just published a beautifully illustrated work entitled 'Neu Seeland,' which I commend to the attention of geologists and naturalists as well as to geographers.

of altitude, have been received from these travellers, and are being prepared for publication in the 'Mittheilungen.') The other communications relating to Africa, are *M. v. Bessmann's* Journeys in Nubia and Soudan, 1860 and 1861. *Dr. A. Roscher's* Notes of his Journey from Zanzibar to the River Lufji, 1859. *Baron von der Decken's* and *Dr. Karschen's* Second Journey to Kilimanjaro, 1862, in which they ascended that peak to the height of 19,000 feet, and encamped in the snow. A memoir on the Exploration of the Gaboon Country, by *P. Du Chaillu* and others (with map); the River Systems of the Niger, Benue, Calabar and Cameroon (with very detailed map, showing the routes of all European travellers and native itineraries); on the Present State of Geographical Knowledge of Congo and Angola, a careful digest of the oldest as well as most recent authorities, including MSS. documents (with detailed map).

AUSTRALIA AND POLYNESIA.—Besides the illustration of the Expeditions of Stuart, Burke, F. Gregory, McKinlay, &c., as illustrated by four maps which have recently been brought out in one clear compendious map, the principal original papers have been those by *F. v. Hochstetter* of his Journeys and Observations in New Zealand. Of this traveller four papers have been given, illustrated by four maps, viz., one general map of New Zealand, a topographical map of the Isthmus of Auckland, and two geological maps of the province of Nelson and of the region of Roto Mahana, with its hot springs. Also, papers on the Guano Islands of the Pacific and the Islands to the East of New Guinea, by the Indian missionary, D. Carlo Salerio.

AMERICA.—Reichel's Observations on Labrador and the Missionary Stations there (with two maps of the country round Okak and Nain, from his observations). *Dr. H. Berend's* Observations on Mexico. *Dr. Moritz Wagner* (three papers): Volcanoes of Central America; Exploration of the Interior of the Isthmus of San Blas, east of Panama (with map); and Province of Chiriqui (with detailed map). *Dr. A. v. Frantz's*, Costa Rica. *A. Kappler*, Expedition of the Dutch and French into the Interior of Guiana, 1861. *J. J. v. Tschudi*, Brazilian Province of Minas Geraes (with large map by Halfeld, from the official surveys in 1833-1835). *Burmeister*, Artesian Wells at Buenos Ayres.

POLAR REGIONS.—The Swedish Expedition to Spitzbergen, 1861, in which *M. Forall* has added many new and important geological data, has likewise been well illustrated.

Having mentioned that expedition, I have much pleasure in requesting my hearers to peruse the third volume of the work of Dr. Scherzer, which gives in very clear and attractive style the historical narrative of that survey. When all the scientific details which were collected by the physicists and naturalists of that memorable expedition shall be published, Austria will doubtless receive the praise which is due to her for having sent a frigate round the world solely to augment our acquaintance with the natural productions physical structure, climatic conditions, and inhabitants of various remote regions.

Greenland—Former Conditions of Northern Europe.—Our knowledge respecting the snow and ice clad region of Greenland has been from time to time largely increased by the communications of our foreign member Dr. Rink. It is in part through his memoirs, as published in our volumes, that geologists have been enabled to reason upon what they believe to have been the former glacial condition of Scotland, and other tracts in Northern Europe, during a period antecedent to the creation of man. Independently, however, of any acquaintance with the condition of Greenland, as explanatory of ancient phenomena, my illustrious friend Agassiz, in the year 1840, boldly applied to the larger part of the northern hemisphere, and specially to Scotland, the doctrine which he had derived from a study of the effects produced by glaciers in the Alps. Wherever he found that the hardest rocks of North Britain had been ground down, polished, and striated by lines and furrows in the same manner as that by which the rocks beneath or on the side of existing glaciers are affected, there he contended solid ice had once advanced from the mountains to the sea-shore. This view, though supported vigorously by my dear friend and eminent master, the late Dr. Buckland, met at first with much opposition, though of late years it has been well upheld by much good evidence, patiently worked out by Professor Ramsay and various authors; and in the last years particularly by Mr. Jamieson of Ellon in Aberdeenshire, and by Mr. Archibald Geikie, of the Geological Survey. Now that the direct analogy of Greenland has been prominently brought forward, the bold theory of the great Swiss naturalist, who founded it on his knowledge of the Alps, has, to his great honour, been well sustained. Though once a sceptic as to a former spread of snow and ice over a large portion of Scotland, I have for some time been a firm believer in the application to that country of this portion of the theory of Agassiz.

The manner in which the snow of the mountains descends and in the first instance forms "névé," the solid glaciers which advance to the shores of Greenland, and the mode in which huge masses of these glaciers are broken off and launched into the sea, have been described by other authors, but by none more clearly than by Dr. Rink, whose long residence in Greenland has naturally given him favourable opportunities for observation. In his last memoir Dr. Rink has shown us, that though little water is apparent on the surface of the ice, yet that every glacier is a frozen mountain-river, which is greatly aided in its descent to the sea by a volume of water (about a sixth part of the whole icy mass), which flows either in interstices of the ice, or between the warmer subsoil and the thick cover of ice which prevents congelation. The proofs of the issue of large quantities of water from beneath the lofty ice-cliffs is seen by the issue of springs of fresh water, which rise like whirlpools at the external edge of the ice; and that some terrestrial living things are brought out in these agitated masses is proved by myriads of sea-birds being seen to hover over them, to obtain food in the brackish and muddy water.

The occurrence of an unfrozen lake at a certain distance inland in one of the great glaciers, and the occasional sinking of its water, is accompanied by a corresponding rise of the springs in the sea, and the rise of its water by their diminution. At first sight I thought it possible that this existing phenomenon might in some degree serve, though by no means entirely, to explain the manner in which Mr. Jamieson, adopting the theory of Agassiz, has recently accounted for the so-called Parallel Roads of Glen Roy; * the lake on whose edges these terraces are supposed to have been formed having been held up by a glacier, the successive shrinkings of which at intervals let the water off from higher to lower levels. But looking to the Greenland case as the result of occasional and frequent openings of channels for the water, I see nothing in it which will account for the gravel terraces of Glen Roy at separate and distinct heights. In our Highland example, I now believe with Agassiz and Jamieson, that the lacustrine waters were held up by a glacier; yet, knowing that each gravel terrace on their shores could only have been formed in tranquil periods, the distinct separation of the one from the other is to me a clear proof that sudden movements of the subsoil and rapid change of climate occasioned paroxysmal dislodgments of these icy barriers. In this

* See Quarterly Journal Geological Society, vol. xix. (1863.)

way the successive subsidences due to the sudden collapse and removal of large portions of glaciers will as well account for the distinct separation of terraces which were accumulated during periods of quiescence, as the successive upheavals of the sea-shore (as I shall presently show) explain to us clearly how the heaps and terraces of gravel with sea-shells, which occur at different altitudes around the British Isles, were produced.

In this way the geologist, reasoning upon true existing causes to which he can still appeal, calls up before the mind's eye the ancient physical geography of the surface at a period in all probability antecedent to the creation of man. Pursuing the same mode of reasoning into periods much more remote, he performs the part of the comparative geographer, and can, like Godwin Austen,* map out as pristine oceans the larger portions of our present continent and islands. For, as many of these masses of land are replete with the remains of marine animals, the inference is inevitable, that these materials must have been accumulated under the sea, and subsequently raised into the atmosphere to form dry land. On the other hand, as these desiccated sea-bottoms and sea-shores, which are now habitable lands, are filled with the detritus and fragments derived from ancient rocks; so in those tracts where there are no similar rocks at hand to account for such *spolia*, we infer that, just as the bottom of the sea has been raised up in one tract into dry land, so many of the ancient continents and islands from which such rocky fragments were derived, have disappeared and been submerged, though others remain above the waters. In this point of view the science of geology is true ancient physical geography.

But to return to the consideration of that glacial condition of the surface which geologists are pretty generally agreed upon as having been that which immediately preceded the creation of the human race. Believing, as I now do, that snow and ice formerly covered, during the whole year, my native Highlands, as well as the mountainous parts of England, Wales,† and Ireland, and, further, that glaciers descended from the higher grounds into the adjacent valleys and to the sea-board, transporting into the sea-bottom great blocks as well as enormous accumulations of clay and sand with striated fragments of rocks, constituting the "till" of Scottish

* See Quarterly Journal Geol. Soc., vol. xii., p. 1856, and other memoirs by Mr. Austen.

† On this subject Professor Ramsay's excellent and original Papers should be consulted; particularly the general reader should peruse his Essay on the 'Old Glaciers of Switzerland and North Wales,' in the 1st volume of 'Peaks, Passes, and Glaciers,' and also published as a separate volume.

geologists,* I must impress upon you that, in adopting this view, you do not embrace the largest portion of the operations of transport which took place in the glacial period. For, when the ancient glaciers advanced to the seas of that glacial epoch, they must (as is now taking place on the shores of Greenland) have launched from their cliffs huge icebergs, which were floated away by the prevailing currents, often to vast distances before they were melted. So in the present day numerous icebergs are wafted for hundreds of miles to warmer and southern seas, in which they disappear, and strew the surface of the sea-bottom with the blocks and pebbles with which they were loaded; to be mixed up with marine shells, sand, and mud.

Similar accumulations of a former period are called by geologists "marine glacial drift;" and, as they are found to be spread over wide terrestrial areas, both in low tracts and on hills of some altitude, it is clear that such low lands and hills were submerged during the mixture of these water-worn materials with sea-shells, and have since been elevated from beneath the sea to their present position. The coasts, and some of the bays, of Scotland, and of parts of the north of England, North Wales, and Ireland, afford, indeed, proofs of the glacial drift with shells lying at various heights above the sea up to altitudes of about 1300 feet.

In no part of Europe, however, are the evidences of glacial drift and huge erratic blocks so remarkable as in that enormous region over which such wide-spread detritus has been shed from the ancient glaciers of northern Scandinavia and Lapland, and been carried, eccentrically, to the shores of the North Sea—to the heart of Russia in Europe—over the plains of Poland—up to the foot of the Carpathian Mountains, and finally over all Northern Germany, including the kingdom of Prussia. On this point I may refer you to the detailed description of this grand phenomenon, given by my colleagues de Verneuil, von Keyserling, and myself, in our large volumes on Russia and the Ural Mountains—a work little referred to, I apprehend, by my countrymen. In the map attached to that work we laid down for the first time the south-eastern, southern, and south-western lines to which this, the grandest of all the European glacial drifts, extended, when all the kingdoms now covered by it must have been beneath the sea. In short, we showed clearly that

* See the very clear and able illustration of this subject, with a map shewing the various directions followed by the old glaciers, in the book entitled, 'On the Phenomena of the Glacial Drift of Scotland,' by Archibald Geikie. Glasgow, 1863.

the south of Sweden, as well as Finland, Russia, and all Northern Germany, must have been submarine when the erratic blocks derived from the glaciers of Lapland and the north of Scandinavia were floated far away, some of them to distances of 700 or 800 miles from their original sites.*

When we reflect upon the differences which the map of Europe at the period of this translation of glacial detritus must have exhibited, if constructed when whole kingdoms were under the sea, and that this grand operation was coincident with the existence of species of shells which are still living, and this, too, in the period antecedent to the creation of man, the physical geographer naturally appeals to the geologist, and craves from him some information as to the manner in which these enormous transformations of vast sea-bottoms into plateaux, continents, and islands, may have been brought about.

Now, although all geologists agree that such mutations did take place, we are not of one mind as to the manner in which these mighty changes were effected. One school maintains, that, if we extend existing causes backwards into countless ages, their action has been adequate to account for all these changes of sea and land. On the other hand, there are many practical geologists, including myself, who see in most lands, and particularly in all mountain-chains, numerous great breaks and frequent inversions of rock formations, which are the clearest proofs of violent fracture, and which no amount of small and imperceptible risings could ever have effected. We therefore infer that some of the changes between sea and land, which accompanied and followed the glacial period, were, like many that preceded them, suddenly produced. Fully admitting that there were long periods of quiescence, during which the crust of the earth was subject, as at present, to small imperceptible movements only of elevation and depression, we believe that there were also at intervals powerful and sudden upheavals and downthrows, accompanied, doubtless, by great translations of water.

As regards the more recent elevations and depressions, we sustain this belief by showing that marine remains of the most recent tertiary date (the post-pliocene of Lyell) are found at different altitudes, separated from each other by great intermedial spaces, wherein such remains are not traceable or visible. These marine

* See 'Russia in Europe,' &c., chapters 20 and 21, with diagrams, and particularly the map.

remains generally occupy separate terraces or plateaux and elevated plains, and are rarely if ever seen lying continuously in slopes upon a hill or mountain side, as if indicating a gradual uprising from the sea-shore to their present positions (often upwards of 1000 feet above the sea). Had slowly gradual causes been in action only, we should surely have seen proofs of the phenomenon by finding the marine remains arrayed in *sloping* accumulations, and not in terraces or heaps at separate altitudes, which necessarily imply sudden jerks or lifts. We further argue, that, if the very slight and almost imperceptible movement (and, in some instances, perfect stability, of the present surface of certain tracts during the last 2000 years) were alone to be appealed to, no conceivable amount of time would explain many of the broken features which Nature presents to us.* Thus we know, from finding remains and bones of the same species of extinct mammalia in the gravel of Britain and the Continent, that at a, geologically speaking, recent period our islands were united with France. We also know, from the skeletons of the great Irish elk, which are found in the bottom of the bogs of Ireland, and also in the Isle of Man and in Cheshire, that when that creature lived these three islands must have been united. Yet it cannot surely be maintained, that by the ordinary action of the sea, and a gradual depression of the lands now sunk beneath the Irish Channel, England and Ireland were separated since the big elk inhabited our lands. Nor by such gradual agency only can we ever account for the formation of the great channel which now separates England from France.

My firm belief, indeed, is, that these separations were effected in the first instance by powerful breaks of continuity, caused by much grander earthquakes than any of which history affords a record, due to expansive internal forces, which gave rise to great upheavals and subsidences in the crust of the earth. In more remote periods, or those of older geological date, these forces have, we well know, produced still more intense disruptions, and have even abruptly thrown enormous masses of hard pebbly sediment under the rocks out of whose detritus they have been derived.

But even looking at the changes which were produced in the comparatively modern glacial period, and in that which immediately followed it, I view each of these sea-shell terraces to which I have

* There is every reason to believe that the eastern shores of Britain, where Caesar landed, have not changed their relation to the sea-level since that event.

alluded, and which present themselves at separate levels around the coasts of continents and islands, as clear proofs that they were not placed in their present positions by continuous gentle gradual movements, but have been, I repeat, heaved up suddenly; such movements having been accompanied by powerful translations of water, which completed by denudation the work which great earthquakes and dislocations began.

I must not, however, wander further into such geological considerations, though I may take leave to say, in reference to the former changes of the surface of the globe, that whether we adopt, as I do, the theory of former, occasional, great paroxysmal disturbances, followed by long periods of quiescence, or that of an uniformity of causation during all ages, I have already said enough to show that the sciences of Geology and Geography are inseparably connected. This subject has, indeed, been well treated lately by Professor Ramsay in his published lectures on the Physical Geology and Geography of Great Britain.* Such of my hearers as wish to follow out this subject, and who have not time to study the great works of Lyell on the Principles of Geology, will do well to read a lecture of Professor Ansted, entitled, 'The Correlation of the Natural History of Sciences,'† in which the author happily demonstrates that Geology includes Physical Geography, General Physics, Chemistry, Astronomy, Zoology, and Botany, and is therefore a history of Nature during all time.

ASIA.

Central Asia.—The southern portion of Central Asia—a region which is peculiarly interesting to British geographers—has recently received a valuable illustration through the explorations of M. Nicholas Khanikoff and his scientific Russian associates, to which some allusion was made in the Address of last year. As an experienced traveller in Persia and Bokhara in previous years, M. Khanikoff devotes the first sixty-eight pages of the work he has published to a fair and well-condensed retrospect of the labours of his predecessors in the provinces of Khorassan, Yezd, Kirman, Seistan, and a part of Afghanistan.

Among the earliest geographers to whom M. Khanikoff renders just tribute, I am glad to see that the names of our countrymen,

* Stanford, 1863.

† London and Cambridge. MacMillan. 1863.

Rennel and Forster, stand out conspicuously; the one as the joint founder with the celebrated D'Anville of the science of Comparative Geography, the other as the first traveller, in modern times, who crossed the Continent of Asia from India to Europe, and who did so successfully in the disguise of an Oriental pilgrim.

In the early part of the present century (1807-9) the French *savans* Dupré, Jaubert, Trézel, and Truilbiet, who were attached to General Gardanne's Mission to Persia, zealously exerted themselves in extending our acquaintance with that country: and shortly afterwards further accessions to our knowledge were made by the travels of our countrymen, Pottinger and Christie, who were sent to explore Southern and Central Persia by my lamented and gifted friend the late Sir John Malcolm, when that distinguished man proceeded with a brilliant staff of officers from India to counteract French influence at the Court of the Shah. Of their travels and observations, as well as of the great general work of Malcolm himself, the 'History of Persia,' M. Khanikoff gives a succinct account. Enlivening his recital by allusions to the 'Lalla Rookh' of Moore and the 'Hadji Baba' of Morier, he assures us, and competent English Orientalists agree with him, that the last is the best work ever written, as giving a faithful and vigorous picture of the habits of the higher classes in Persia. Returning to pure geography and travels, he criticises somewhat severely the memoir and map of Macdonald Kinneir, as superficial and devoid of novelty; but praises highly the solid information contained in the rich materials given to us by Sir William Ouseley. He also mentions with much commendation the numerous geographical data and positive observations of Baillie Fraser and the acumen of Arrowsmith in preparing his map. He then shows how the lamented and gifted Arthur Conolly, from his more perfect acquaintance with the language of the natives, surpassed in many respects all his predecessors—especially in his faithful sketch of the social condition of the people. In one of his earlier expeditions, M. Khanikoff knew Conolly well; and quitted Bokhara only forty days before that unfortunate officer, and his companion, Colonel Stoddart, were assassinated by order of the crazy Emir.

M. Khanikoff next speaks of another of our English enterprising heroes, my dear friend Alexander Burnes, who formerly so captivated us by his lively and intelligent communications, and from whose flying notes Arrowsmith was enabled to construct the map of those

countries which for a long time was our only authority. This retrospect of the labours of British explorers and geographers will be read with pleasure.

Turning to other labourers, M. Khanikoff considers the maps of Zimmermann to be complicated and confused. The Russian mathematician Lemm is then brought out, and the vast number of his astronomical observations, his lines of march through Persia, as well as his determination of the heights of the mountains, are noticed. He informs us, that, in a journey of thirteen months, Lemm determined 129 geographical points, over 10 degrees of latitude and over 15 degrees of longitude, and of these eighty-three stations were in Persia.

The admirable grouping of the labours of these travellers by the lamented Carl Ritter, particularly in regard to the southern parts of the interior of Asia as given in his eighth volume, is deservedly praised as the best type of descriptive geography; and I specially recommend those pages of M. Khanikoff (44 to 55) to the perusal of such of my associates as desire to seize the salient points of the writings of that great Prussian geographer and excellent man, Carl Ritter.

As to the 'Asie Centrale,' that striking work of my illustrious friend Alexander von Humboldt, and which was duly analysed in former volumes of our Journals, M. Khanikoff alludes but little to it, since it scarcely touches upon Persia and Khorassan. On the other hand, he expatiates on the more recent military operations in Central Asia, such as the Shah of Persia's advance upon Herat, the Russian efforts to reach Khiva, and the English expedition to Cabul, showing how much geographical science has benefitted by such movements, though in a military point of view they were real disasters. We thus have references to the labours of Major D'Arcy Todd, who travelled from Teheran by Herat, Candahar and Cabul to Simla, and was subsequently for some years stationed at Herat as our Envoy; and we have notices also of Major Todd's assistants, James Abbott and Richmond Shakespeare, both of whom passed from Herat by Khiva and Orenburg to the Russian capital; the journey of the latter officer having been recorded at the time in our Journal.

Not omitting to notice the value of the astronomical and hypsometrical observations of Major Gough, published in 1841, M. Khanikoff further attaches much importance to data accumulated by Edward Conolly (brother of the traveller) in Western Afghan-

istan, and particularly in regard to the form of the great lake Hamoun in Seistan.

After an analysis and criticism of the labours of Ferrier and Keith Abbott, and due reference to the 25th volume of our Society's Journal, in which the tours of the last of these travellers are published, he speaks of the extraordinary journey said to have been performed by a French officer by the head-waters of the Heri-rud to Herat, which, if it be an authentic narrative, is deserving of the highest admiration.

Having thus given a succinct analysis, in chronological order, of recent travels in Central Asia, showing what French and English travellers had respectively accomplished, and how his countryman Lemm was the first to furnish solid materials for the construction of a map of Eastern Persia, M. Khanikoff points out how much remained to be done before a correct idea could be formed of the physical features of this region. In order, therefore, to obtain a somewhat better acquaintance with the great terraces at the foot of the mountains, with the hydrography of the country, the structure and direction of the mountain-chains, the fauna, flora, and ethnography of the region, as well as to make observations on terrestrial magnetism and heat, he proposed that a scientific expedition should be formed in Russia. His proposal was willingly embraced by the Imperial Geographical Society of St. Petersburg; and, aided by men distinguished in astronomy, botany, geology, and topography, M. Khanikoff was himself named chief of the Commission. For this station his previous journeys and experience in the East had thoroughly qualified him; for, besides having resided during many years in the North of Persia, he had been in one expedition the companion of that great botanist the late M. Lehmann, and at another period he had been, as before said, the friend and colleague of our unfortunate countrymen Conolly and Stoddart, at Bokhara.

In the volume already published, and which can only be considered as a prelude to the rich materials which are to follow, M. Khanikoff gives us a sketch of the whole line of march of the Russian scientific Commission eastward into northern Khorassan, then across part of Affghanistan to Herat, and thence into Seistan on the borders of Beloochistan, and further by Nilo, across the great saline desert of Lout, to Kerman. Having sent observers to Tebes and other places, he returned by Ardekán to Teheran. In perusing the sketch of the difficulties which he had to overcome in transporting his small party across certain tracts, particularly the

great saline and waterless desert called Lout, the reader cannot but be forcibly impressed with the enormous difficulty, if not, indeed, the impossibility, of moving any regular modern army, with its baggage, artillery, and commissariat, across such regions; and this may afford some comfort to those persons who have been needlessly alarmed, at the bugbear of a Russian overland invasion of British India with a vast host!

As the small map which accompanies his memoir is very clear and satisfactory, and is essentially a great improvement upon the previous maps of these tracts, we have to thank M. Khanikoff for this instalment of a work, the first sketches of which were laid before British geographers by himself, at the Oxford Meeting of the British Association (1860).

The western portions of Persia, and much of the region to the south of the Caucasus, had been well examined by our early Medallist Sir H. Rawlinson and others, including General Monteith; but the geography of Southern and Eastern Persia, and the adjacent countries, has been infinitely better defined by the researches of M. Khanikoff and his party than by his precursors.

In a short time it is to be hoped that very valuable additions to our acquaintance with the geography of Western Persia will also be made by the publication of the labours of Lieutenant Glascott, R.N., who was employed as surveyor from 1849 to 1853 with the Anglo-Russian Commission, appointed to fix the delimitation of the Turco-Persian frontier from the mouth of the Euphrates to Mount Ararat; and who has been occupied ever since, in conjunction with his Russian colleague, in laying down the result of the survey on a map of enormous dimensions, and containing the correction of the geographical positions of many places to the east and west of that hitherto ill-determined frontier. The frontier of Persia in the opposite or south-eastern direction seems to have been of an equally uncertain nature, and at various periods to have encroached considerably upon Beloochistan. Of that region, and particularly as regards the northern coast of the Indian Ocean, we have acquired information, which is quite fresh, from the journey of Major Goldsmid, of which I have elsewhere spoken. In his examination of the particular track along which the electric telegraph which is to connect British India with London, will pass, that officer has ascertained that several of the rivers and other geographical points have been very inaccurately placed on all former maps. In fact, although Pottinger, Masson and others have travelled extensively

in Beloochistan Proper, and although we have marched an army through the province and still retain a Resident at its capital, we were very ignorant of the sterile region which forms its southern shores, and which is governed by petty chiefs under the suzerainty of the Khan of Kelat.

Proposed New Route to British India.—In the preceding notice of the character of Lord Gifford, I have specially alluded in a note to the striking photographs of the Himalayan and Cashmirian regions by his Lordship's brother, Lord William Hay. After a long residence in the mountainous parts of India, and a frequent intercourse with travellers from the north-west, or the countries of Bokhara, Kashgar, Ladak, &c., Lord William contemplates a return to his post by an overland route which no one individual, and certainly no European, has yet followed. If he can meet with the protection of the Russian Government, he would take the line across Siberia, followed by the lamented Atkinson—i. e. by Nijni Novgorod, Ekaterinburg, Omsk, Semipalatinsk, Azof, Kopal to Issyk-kul. He calculates that he might reach that distant place in fifty-two days' travelling from Nijni Novgorod, or say in two months. From Issyk-kul to Kashgar is only 250 miles, and allowing for every difficulty he assigns to this march fifteen days; from Kashgar to Le by Yarkand, he gives thirty-six days, and from Le to Kungur in Cashmere fifteen days, or in the whole about four months.

Now, Lord William Hay is not a wild schemer, but a practised traveller—one of the four brothers of that family* who have traversed the Himalaya to the plains of Thibet. After fourteen years' residence in those mountains and in Cashmere, and after obtaining for us all the real intelligence we possess respecting the fate of poor Adolf Schlagintweit at Kashgar, he has well weighed the possible obstacles to such an enterprise. He knows that the present political state of affairs in the region of Kashgar and Yarkand is very different from what it was when Adolf Schlagintweit was assassinated; and he also infers that in the journey from Issyk-kul or those wild hordes of Kirghiz over whom the Russian power extends he would have great advantages if furnished with Imperial passports and support. I need not say that, as I warmly approve the bold project, I will do all in my power to induce the Imperial Government to enable this enlightened British nobleman to execute a journey which has never been performed by any European, and

* See Gifford in the Obituary.

which, if he passed over the Karakorum into Cashmere, would unite in one long chain the old route of Marco Polo with the journeys of modern travellers who have hitherto vainly endeavoured to pass from the east to west or from west to east in those latitudes.

Indian Navy.—On the 30th of April of the present year the Indian Navy ceased to exist; the Commodore's broad pendant having been hauled down at Bombay on that day. I cannot, therefore, allow this occasion to pass without making some allusion to the debt which geography owes to the officers of that distinguished service. The war services of the Indian Navy in Burmah, China, and Persia, as well as the beneficial and enduring results of its repression of piracy and the slave-trade are well known. These services have been varied, honourable, and useful; but, in the eyes of geographers, the wide-spread and lasting utility of the excellent surveys made by officers of the Indian Navy on the coasts of India and Arabia, in the Persian Gulf, and in the Red Sea, on the coasts of China and Cochin China, hold an equally prominent place; nor as a geologist can I omit to call to your recollection the admirable memoirs of Dr. Carter on the structure and fossils of the coasts of the Persian Gulf. In the abolition of the Indian Navy, the Bombay Geographical Society will, I fear, sustain a loss which it will not be easy to replace; while the numerous able papers scattered through our own volumes, by Kempthorne, Selby, and other officers of that service, remind us that we are sharers in the loss. I trust, however, although their honourable career in the Indian Navy has come to a close, that many of the gallant officers who composed it will still be enabled to render their great ability as surveyors and explorers available for the advancement of geographical science.

Telegraphic Communication by Land and by Sea.—Two years have elapsed since Sir Henry Rawlinson brought under the consideration of this Society the importance of constructing an overland telegraphic communication with India, and pointed out how far the work had already proceeded, and the track which ought to be followed in completing the remainder of the line. He justly observed, that the Royal Geographical Society would do itself honour by encouraging this great work. At that time, however, no one had accurately examined the nature of the country of Mekran at the head of the Indian Sea, which lies between the British Indian frontier, near Kurrachee, and the mouth of the Persian Gulf. That task has been now accomplished by Major Goldsmid, who has shown

that there are no real physical or political obstacles throughout the tract in question; the greater part of which is tributary to the Khan of Beloochistan, the western portion only being subject to the influence of Persia. I have elsewhere alluded to the sketch of Major Goldsmid as making us acquainted with a tract, which, though it was, in days of yore, the scene of great events, had so passed into oblivion that, save for the unpublished notice of it by one Englishman, a Mr. Macleod, who traversed a portion of it only, the nature of the country was quite unknown to us; the position even of the rivers which flow into the sea having been most incorrectly laid down on all our maps. The search for the best line for the construction of the most comprehensive civilizer of modern days, the Electric Telegraph, has thus called once more into prominent notice a region, the shores of which, in all probability, were coasted by the ships of Solomon when trading to Ophir, and the interior of which was undoubtedly traversed by the armies of Alexander the Great.

The direction of the whole of this telegraphic communication, which is to be in part submarine, has fortunately been placed under the management of Colonel Patrick Stewart, an officer of the Indian Army, signally distinguished by the great ability and intrepidity with which he rapidly constructed those lines of telegraph in India, during the late rebellion of the native army, which were of such essential service to Lord Clyde.

Colonel Patrick Stewart, who has personally examined a great portion of the line, including the coast of Mekran, informs me that the first link of the chain between India and Europe is that to which I have just alluded as having been explored by Major Goldsmid. This section, from Kurrachee to Gwadel, measures about 400 miles, and along a considerable portion of it, 250 miles from Kurrachee, telegraphic stations have already been erected. From Gwadel the line becomes submarine for about 400 miles as far as the Arabian headland called Ras-al-Jebel, at the entrance of the Persian Gulf, from which station another submarine stretch of 430 miles will bring the telegraph to the port of Bushire, whence the land-line will branch off, passing through Shiraz and Ispahan to Teheran and eventually to Constantinople. A branch-line is also to be extended from Teheran to Baghdad, which will provide a secondary or alternative means of communicating between Baghdad and Bushire. The principal and more direct line, however, between these points, is that which it is proposed to carry out

by means of a submarine stretch of 170 miles, from Bushire to Fao, at the mouth of the Shat-el-Arab river, and thence, by land, through Bassorah and along the western bank of the Euphrates, to ancient Babylon and Baghdad. The line from Baghdad to Constantinople, which was constructed some years back by British officers and workmen at the expense of the Turkish Government, continues in good working order, and telegraphic messages are thus constantly passing between London and Baghdad along a track which is more than two-thirds of the entire distance to India.

I further learn from Colonel Stewart that the ships from which the submarine cable will be laid are to leave England in July, and that the operation of submerging it will commence about the middle of November, and be terminated in December. It is also confidently expected that the land-line from Fao to Baghdad will be speedily finished, and that a direct and through communication from London to Calcutta will thus be for the first time established before our next Anniversary Meeting. Further, it is calculated that the alternative line through Persia will also be finished in the spring of next year, and that a double means will be thus afforded of communicating with our great Indian Empire.

While enterprise and capital are thus employed in connecting England with India, one of our associates, Mr. C. M. Grant, who recently contributed an instructive sketch of his travels from China to Siberia, across the Desert of Gobi, is now actively employed in the endeavour to induce the Government of Russia to establish a telegraphic communication between Kiachta and Peking, and even, if possible, so to extend the Siberian line eastwards as to reach the shores of the Sea of Ochotsk, whence to the continent of Russian North America the transit requires a short submarine stretch only. There can be little doubt that, independent of other considerations, this would be the line of all others by which Europe and America can best interchange messages. Should such and other enterprises like these succeed, men, even of my own age, may live to find the electric spark carrying knowledge in a few minutes round the globe, and enabling us even to converse with our countrymen at the antipodes. Already an attempt is being made to put us in direct communication with Australia; Mr. F. Gisborne, brother of the late Sir Lionel Gisborne, being engaged in an attempt to organize a telegraphic service from Calcutta, through Burmah and the Malay peninsula to Singapore, and thence to Batavia, Soerabaya, Timor, and North Australia, *via* Melville Island.

Whilst the physical geographer is sure to acquire fresh knowledge by the examination of distant lands over which telegraphic wires have been, or are about to be laid down, and that submarine cables are in action in seas of such limited dimensions as the Mediterranean, the Red Sea, and the Persian Gulf, let us not despair of obtaining such a better acquaintance with the bottom of the great ocean which separates Europe from America, as will greatly obviate the difficulties which have hitherto impeded the successful accomplishment of the grandest of all the submarine telegraphs which have been proposed. To this point I next direct your attention.

North Atlantic Sea-Bed.—In contributing to our better acquaintance with the natural history of the sea, as ascertained during the voyage of H.M.S. *Bulldog*, under the command of Sir Leopold McClintock, Dr. Wallich* produced, by soundings at great depths, excellent materials to enable men of science to appreciate more correctly than before, the feasibility of laying down a submarine telegraph between Ireland and North America. Extending the Bathymetrical limits of animal life in the ocean to the great depth of 7500 feet, or $1\frac{1}{2}$ miles, beneath its surface, and working out accurate data as to the varied condition of the sea-bottom at different depths, he was well qualified to propose to our Council a scheme for such a systematic survey of the sea and sea-bed between Ireland and Newfoundland, as might lead to the laying on a sound basis a submarine telegraphic cable between the two countries.

Attributing the fears and doubts as to a successful issue of the schemes put forth chiefly to the inadequate methods hitherto employed in examining the sea-bed by the rapid transit of our surveying ships, and by soundings taken on one line only at great distances apart, Dr. Wallich proposed that a much closer search should be made before telegraphic cables were lowered into unknown depths, and laid across submarine hills, gorges, and valleys, the irregularity of whose forms, as existing between the points hitherto sounded, might prove to be enormous. He argued that a full and proper submarine search was as essential a preliminary to a rational scheme of laying down a telegraphic cable, as a survey of the outlines of land was requisite for the engineer before he could accurately define the best and safest line to be followed by a railroad.

* See Dr. Wallich's work, published with the sanction of the Lords of the Admiralty, entitled "The North Atlantic Sea-Bed." London, 1862. Van Voorst.

Being of opinion that such an effort was well worthy of their encouragement, the Council of our Society supported the project of Dr. Wallich, not only in the belief that its execution must throw much light on this interesting branch of physical geography, but would also develop various phenomena of great interest in natural history, geology, meteorology, and physics. On my own part, being very desirous of seeing so noble an exercise of the searching powers of this great maritime nation set on foot under the management of so energetic a naturalist as Dr. Wallich, I earnestly recommended its adoption to the First Lord of the Admiralty. But, as the project matured, it speedily appeared that Dr. Wallich required two steamers for the effectual survey in question, which demand was considered to be too heavy at a moment when few vessels could be spared from our naval reserves; and hence the consideration of the subject has, for the present, been dropped. I hope, however, that in more quiet times a complete submarine survey of the Atlantic will be carried out, by the joint operations of nations on *both* sides of that ocean; and when that day arrives, I trust that the project of Dr. Wallich, with all his ingenious appliances, will obtain the countenance of the public, just as in an earlier stage it has met with the approbation of the Council of the Royal Geographical Society.

Japan.—The privilege accorded by treaty to the British Minister in Japan to travel through the empire has been taken advantage of by Sir Rutherford Alcock, who during a journey of thirty-two days traversed the island of Kiusiu and a great part of Nippon. In the interesting paper which was read to the Society, much light was thrown upon parts of the country heretofore but little known. Although Dutch Missions had occasionally gone overland from Nagasaki in Kiusiu to Yeddo in Nippon, their opportunities for observation were necessarily limited, owing to the rigour of the surveillance to which they were subjected by the Japanese Government. In the case of our Minister these rules were relaxed; and, although a good deal of jealousy was frequently manifested by the officials, we have acquired a great deal of most valuable and useful knowledge. The part of the road leading from Osaka to Yeddo, and which avoids Miako, traversed by Sir Rutherford, has, so far as we are aware, not been travelled over by any European: the Dutch Missions always following the route through Miako since the expulsion of the Portuguese and Spaniards more than two centuries ago. We have also had a short paper from Mr. Oliphant,

giving some account of the island of Tsusima, a spot which was visited by Europeans for the first time in the spring of 1861; and which derives its importance no less from its geographical position than from the magnificent harbour which it has been discovered to possess.

In spite of these additions to our information of the geography of Japan, there is still much to be done. The whole northern and eastern portion of the central island of Nippon is still unexplored, the large island of Sikok has not yet been visited; while of the northern island of Yesso, which contains a larger superficies than Ireland, we know nothing beyond the observations made by Mr. Pemberton Hodgson during a very limited tour from Hakodadi. The interior, which is supposed to be uninhabited, is still a sealed book. It is to be hoped that no political difficulties will arise, to put a stop to the interesting work of exploration in a country which affords such a wide field for the labours, not only of geographers, but of men of science generally.

Mexico.—A good addition to the valuable descriptions of Humboldt respecting the meteorology of this country as dependent on its physical structure and outline has been recently published by M. Henri de Saussure of Geneva. Visiting Mexico before the French invasion the author has, notwithstanding the continual interruptions to the prosecution of travel caused by the civil wars which desolated that interesting region, succeeded in sketching in a very clear manner the great features, and also in explaining the causes, of its very remarkable hydrology.

South America. Peru.—Don Antonio Raimondy, who has been occupied for two years in exploring that part of the valley of the Amazons, and of its tributaries the Huallaga and Ucayali, which is comprised within the Republic of Peru, has recently published a valuable geographical work, with maps, which has increased our knowledge of that vast but little known region. Another Peruvian geographer, Don Mariano Paz Soldan, whose brother's work, '*Geografía del Peru*,' has recently been presented to the library of this Society, is now preparing in Paris a large map of Peru, together with a volume of plans and views.

Mr. R. Clements Markham, while employed by the Indian Government in superintending the collection of seeds and plants of the quinine-yielding *Cinchona* in 1860, explored the courses of two of the principal sources of the great River Purus, one of the most important but least known of the tributaries of the River Amazons,

for a considerable distance, and thus added to the geographical information which he had previously collected during his travels in 1853 respecting this almost unknown part of South America.*

Brazil.—Mr. H. W. Bates, the former companion of Mr. Wallace, who, as a most enterprising naturalist and ethnologist, has recently become known to the public through his excellent new work, 'The Naturalist on the Amazons,' has also increased our geographical knowledge of the main stream of that great river from Ega to its mouth, and of some portions of its tributary the Tapajos.

Australia.—Much as had been accomplished in preceding years by the bold explorers of the interior of Australia, the past year is, if possible, still more remarkable in the amount of satisfactory results, as obtained by the journeys of McDouall Stuart, Landsborough, McKinlay, and Walker. To the progress of these adventurous men I last year adverted in the Address of Lord Ashburton; and now it is my pleasing duty to record their successes. On former occasions, after admiring the first intrepid researches of Leichhardt, we had subsequently to mourn over the loss of that great traveller; and, in honouring Burke and Wills as being the first to reach the Gulf of Carpentaria by a direct route from Victoria, we, alas! could only revere the memories of those and other men, including Leichhardt and Kennedy, who had sacrificed their lives in the cause of geographical discovery. On the present occasion, however, the enterprises of the travellers have happily not been attended with any loss of life, whilst the objects in view have all been satisfactorily accomplished.

To begin with the last exploits of our former medallist, McDouall Stuart—and for which the late Governor of the colony of South Australia, Sir Richard MacDonnell, claims the blue riband of Australian exploration. No one can peruse the diary of Stuart's last journey from Adelaide on the southern to Van Diemen Gulf on the northern shore, without admiring the steady perseverance with which, in his last as in his first expedition, he overcame all the natural obstacles opposed to his progress. Thus, we mark with approbation his repeated and toilsome efforts to penetrate through a thick, waterless, central forest to the north-west. For, if those efforts had succeeded, he would probably have reached the sea at the mouth of the northern Victoria.†

* The volume which Mr. Markham has published descriptive of his last travels has been received with favour by the public, as embracing much interesting history of the native Peruvians with which we were unacquainted; whilst his successful translation of various species of the *Cinchona* plants to India, and the plantation of them in localities best suited to their growth, has met with the unqualified approbation of the Government of India.

† The Victoria was discovered and named by Capt. Wickham, R.N.

or that position to which I have twice adverted in previous Anniversary Addresses as the situation of all others *on the northern coast* best suited in my opinion for the establishment of a new colony. There are, indeed, physico-geographical causes which account for the salubrity of that intertropical station, and to these I shall allude in the sequel. This was the tract to which doubtless Stuart intended to proceed. He was, however, driven from his endeavour to reach the sea-shore nearest to him at the head of Queen's Channel, and was compelled to take a due northerly route, which necessarily brought him to the sea on a meridian much farther to the east. There the land runs out towards the equator in a broad promontory (the Arnheim Land of maps), which, though indented by fine bays, can scarcely be expected to offer the same advantages of climate and productiveness as the tract at the mouth of the northern Victoria. Still, as the route to it from South Australia has been shown to be practicable, even this district, in nearly 12° s. lat., will, it appears, be soon occupied. By a recent letter from Mr. Finke, of Adelaide, I learn that already a private company had been formed there for the purpose of transporting, in April of this year, sheep, cattle, and horses to the newly-discovered lands in Van Diemen Gulf, whilst a vessel with ample supplies will be sent round to meet the new settlers. This commencement will, I trust, induce Her Majesty's Government to take decisive steps as to the method by which this independent body of settlers and others who may join them are to be governed.

The knowledge we previously possessed, that the colonists of Queensland were rapidly pushing on their settlements towards the head of the Gulf of Carpentaria has been recorded in the despatches of Sir George Bowen, and enlarged upon by the Secretary of the Colony, Mr. Herbert, during his recent visit to the mother country. Before these facts transpired Sir Charles Nicholson, on his last return from Australia, pointed out, in a well-argued document addressed to Her Majesty's Secretary for the Colonies, of which I have seen a copy, that large portions of Northern Australia would assuredly be soon occupied by migratory bands of colonists. He therefore called the attention of Her Majesty's Secretary of State to the confusion and disasters which would follow, if neither law nor system were established by Imperial authority for the government of such broad lands. Sir Charles Nicholson has, I think, successfully shown that any colony on the North coast, or even at the head of the Gulf of Carpentaria, would be much too distant from Queensland or South Australia

to be governed with effect from either Brisbane or Adelaide. And now that the colonists from Adelaide are really about to establish themselves in the distant Van Diemen Bay, the very case suggested by him has occurred and some action will, I trust, be taken by the Imperial authority. The establishment of a separate colony on the North coast of Australia has so long been advocated by myself, whether for commercial purposes or for political and maritime considerations, that I rejoice in having lived to see the dawn of the realisation of this great object. The subject is now about to be brought in a striking manner under the notice of our rulers, who, at no cost to the mother country, have simply to give titles to the possession of rich lands, the sale of which, as Sir Charles Nicholson shows, will speedily far more than remunerate the small outlay which is called for in the outset of such an organisation.

But, whilst the success of any settlement on the north coast is a problem about to be solved, I must again express my regret that the Queen's Channel, at the south-east end of Cambridge Gulf, and at the mouth of the northern Victoria, should not have been the spot whereon the first experiment was to be tried by the settlers. The deeply-embayed position of that site, and the simple fact of its being 4 degrees further removed from the Equator, as well as being bounded by large masses of plateau-land, fairly entitle us to believe that such a situation would be much more likely to secure the health and well-being of the settlers than the Van Diemen Gulf of old navigators, which is about two hundred miles more northward, and on the verge of the heated Indian Ocean. It is true that Van Diemen Gulf is protected from the storms and tornadoes by Melville Island and the Coburg peninsula, on which our former ill-selected and exposed station of Port Essington was placed; but still this first experiment would have been more likely to succeed, especially if the mouth of the Victoria had been the site chosen.

In comparing new maps of Australia with those of older date, I find, on referring to the publications of the Society for the Diffusion of Useful Knowledge, that, in their Atlas issued in 1844, Australia is defined as consisting of the colonies of New South Wales, Van Diemen's Land, Port Phillip, South Australia, West Australia, and North Australia. The first, or our oldest settlement, has now had taken from it the region known to former geographers as the Moreton Bay Settlement, which has expanded into the vast and flourishing colony of Queensland (of which hereafter); Van Diemen's Land

has become Tasmania; Port Phillip, then holding a population of 3000 only, has swollen into the rich auriferous land of Victoria, with its grand commercial city of Melbourne; and, whilst West and South Australia have both largely increased in size and importance, the so-called colony of "North Australia" has disappeared from all our maps as an unknown quantity! Yet, on the very map to which I have alluded, the great headland to which McDouall Stuart has found his way from the south, has on it, besides the name of Arnheim Land, the following words engraved in large letters, "Colony of North Australia, established 1838." In the legend of the map no population is indeed affixed to it; but now, after the lapse of a quarter of a century, a few spirited Australian colonists are about to revive the forgotten name of the "Colony of North Australia." *

This result will, indeed, be accelerated if the wise suggestion of the Governor of Queensland be adopted (which, I have every reason to think, has met with the approbation of Her Majesty's Secretary for the Colonies) that a commercial and careening maritime station be established at Port Albany, near Cape York, at the north-eastern extremity of this vast country. In a letter to myself, dated November 19, 1862, Sir G. Bowen, after describing his voyage of exploration of all the north-eastern coast, and showing from the experience of the naval authority, how a safe passage for steamers may always be made within the great Barrier reef, says of Port Albany, "that it is perhaps destined one day to be the Singapore of Australia." Well may we anticipate such a result when we mark the extraordinarily rapid progress of that flourishing new colony of Queensland. In a recent despatch to the Duke of Newcastle which has been communicated to us, Sir G. Bowen calls the attention of his Grace to the progress and present condition of the colony, which, as now defined, has a surface nearly six times greater than that of the United Kingdom, and the very grazing grounds of which are about twice as large as the British Isles; to say nothing of the tracts peculiarly adapted for the growth of cotton. The map which is attached to the Colonial Almanac of Queensland is worthy of commendation as being a correct delineation of the boundaries and divisions of a country which its accomplished Governor considers to be "undoubtedly the most favoured in soil and climate of all the provinces of the British empire" (Letter to the Duke of Newcastle, 8th Jan., 1863).

* Whilst I write, a North Australian Association is in the course of formation in London.

From the results of these considerations we naturally turn to the recent exploits of Landsborough, McKinlay, and Walker. Last year we had, alas! to mourn over the deaths of those noble fellows, Burke and Wills, who were the first to go from Victoria to the sea at the head of the Gulf of Carpentaria, and lost their lives on their return. Well may the motto "Præmiando incitat" be applied to the legislature and inhabitants of Victoria, who have done infinite credit to themselves in removing the remains of those geographical martyrs from the sands where they lay, and in erecting monuments to their memory at the metropolis from which they proceeded.

It is indeed cheering to the heart of every geographer and traveller to read the accounts given by the press of Melbourne of the depth of feeling exhibited by the Governor, Sir H. Barkly, the Legislature, as well as by the crowds of the inhabitants who came together to do honour to the deceased explorers, when monuments were raised to their memory.

To determine with precision the tracts followed by the deceased travellers, and to define the amount of good country for settlement in the region so properly named by Sir H. Barkly "Burke's Land," three of the Colonial Governments have been rivalling each other. In the first place, it was as just as it was honourable to the rich colony of Victoria, that she should take the lead in the endeavour to afford succour to the expedition of Burke and Wills. Accordingly, the ship *Victoria*, under the command of Captain Norman, was despatched with supplies to the head of the Gulf of Carpentaria; whilst arrangements were made with the Government of Queensland for the transmission by the same vessel of a party to explore inland under an able and experienced explorer, Mr. Landsborough. It was also further arranged that Mr. Walker should, with his native mounted police (all bushmen), traverse the country between Brisbane and the head of the Gulf of Carpentaria. The shipwreck which befell the *Firefly*, conveying Landsborough and his party through Torres Straits, and the riskful but successful operation by which the water-logged tender was tugged round the headland and brought up to the mouth of the Albert River, at the head of the Gulf of Carpentaria, have been already recorded. It was then that the researches of Landsborough commenced; and, though the primary object of the Victorian expedition for the relief of Burke and Wills was, alas! frustrated by the deaths of those gallant men, the subsequent results were in the end most satisfactory. For, by these researches we now clearly know that the

territory at the head of the Gulf of Carpentaria was most correctly named the "Plains of Promise,"—a land not too hot, according to Landsborough, for British colonization. Realising the truthfulness of the records of Burke and Wills as to the vast tracts of good land, we may be assured that that region will be soon occupied by our settlers; for Landsborough has told us, and McKinlay has confirmed it, that the country south of the Gulf of Carpentaria is a land rich in herbage, and well fitted for the pasturing of horses, horned cattle, and sheep—the plains being as fattening as any he had ever seen in Australia, and the climate as cool as in many parts where wool is profitably grown (see 'Sydney Herald,' Jan. 21, 1863).

We may also rejoice in the fact recorded by the Exploration Committee of the Royal Survey of Victoria, "that the explorers of the Victorian Expedition were the means of opening out a path from the southern settlements to the northern shores, which they hope will at no distant day be made available for telegraphic communication, by way of Batavia and India, with the mother country." The realisation and complete establishment of such facts are in great measure due to the sagacious and trustworthy explorer, Mr. Landsborough. The son of an accomplished Scottish naturalist, who was an ornament of the Presbyterian Church, Mr. Landsborough was so educated that he possessed all the groundwork for success. After first exploring for 200 miles to the south-west, he took up the return line of Burke and Wills, and first following up the Flinders River south-eastward, he crossed the dividing ground and descended along the banks of the Thomson, and was on his march for Burke's depot, when, fearing for the sufficiency of his provisions, he turned to the east and south, until he struck the River Warrego, which he followed to its junction with the Darling above Fort Burke. I must refer you to the cheering despatch of the Governor of Victoria, Sir H. Barkly, recently read before the Society, for convincing proof that Mr. Landsborough has practically accelerated in a remarkable degree the formation of a northern settlement. Geographically he has taught us that Sturt's desert extends but little to the east, and that between it and the foot of the Eastern Cordilleras there is a vast, rich, and well-watered pastoral country.

Already stock had been driven from New South Wales to these new grounds, and the public press of Victoria predicts that in a year all the region to the east of the 140° E. long. will be mapped

out and occupied for grazing purposes. The prospect of easy access to the sea is also a great attraction to squatters; and it is even said that plans have been already drawn for the construction of a city at the mouth of the Albert on the Gulf of Carpentaria. In short, Mr. Landsborough declared, at a public dinner given to him at Sydney, and at which the Governor, Sir John Young, presided, that if he were going to Carpentaria with stock, he should consider the worst of the journey over when he came to the head of the Gulf.

The journey of Mr. Frederick Walker, with his native bushmen, or mounted police, to the head of the Gulf of Carpentaria, thence up the Flinders, and eventually to the north-east, at Port Denison in the colony of Queensland, has been productive of some very satisfactory results. Thus, he made out that it was near the mouth of the Flinders River that Burke and Wills had their last camps. He also informs us, in laying down the course of the Flinders and Norman Rivers, that, although there are fertile plains at some distance from them, the valleys in which they flow are subject to extensive inundations.

It is due to Mr. Walker to say, that, in parts of his course, he made such astronomical observations as enable us to determine the true course of the Flinders River. Nor must his observations upon the heat of the climate be lost sight of, when we desire to estimate the probability of the success of British settlements.* We have yet, however, to learn the duration of the heat in these regions, and to what extent it is tempered by night breezes and by rains.

On these subjects we have a third good authority in that of McKinlay, who, after great exertions, reached the Gulf of Carpentaria from Adelaide in South Australia, and eventually emerged in the northern parts of the colony of Queensland. To the earlier efforts of this bold explorer, as organised under the government of Sir Richard McDonnell, allusion was made in the Anniversary Address of last year, when, in aiding my predecessor, I spoke of Mr. McKinlay's discovery of the relics of an Englishman, which have since been ascertained to be those of Gray. From that scene of misfortune, near Cooper Creek, McKinlay's course was first to the N.W.; then making a deflection to the east, on account of great floods, he took a course nearly north until he reached the mouth

* Since this Address was read, I have seen Mr. Bourne, the companion of Landsborough; who informs me that, owing to the coolness of the nights, the climate at the head of the Gulf of Carpentaria in S. latitude 18° is much less oppressive than on the Darling River in S. latitude 31°. So little does mere latitude govern the distribution of heat.

of the Flinders River in the Gulf of Carpentaria, whence, deviating to the E.S.E., he ended his trying journey of nearly a year's duration at Port Denison, in the northern part of Queensland. The narrative of this arduous journey of the "Burke Relief Expedition," bound up with three maps, is, as well as the Journals of Stuart and Landsborough, to be purchased in this country.* In perusing these Journals, I have equally admired the sagacity, self-reliance, and endurance of each of those bold explorers; and it would have been a source of real gratification to me to have recommended to our Council that, at this Anniversary, we might assign Gold Medals both to Landsborough and McKinlay. But the Council have felt themselves bound to prefer the antecedent labours of Mr. Frank Gregory in the north-western portion of Australia, which very nearly obtained for that geographer one of our medals last year. In fact, Mr. Frank Gregory had determined by astronomical observation (about 33 degrees of latitude and 19 degrees of longitude) a large, well-watered, and productive region; whilst, with every admiration of their prowess and success, Landsborough and McKinlay have only laid down their routes by dead reckoning. Our highest geographical distinction must therefore be assigned to those who work out our problems scientifically. At the same time we have taken another mode of testifying our admiration of the services of those intrepid and successful explorers, who have traversed this vast continent, by handing to them other tokens of our entire approbation of their labours.

Along the route followed by McKinlay and his associate Middleton, who has recently come among us, we find the same alternations of poor and arid sands,† with well-watered and rich tracts, and the same proofs of occasional inundations, as in the regions visited by McDouall Stuart. In all these three successful expeditions, as well as in that of Burke and Wills, we have now the proofs before us that, whatever may be the obstacles, Australia can be traversed from south to north by different routes.

Nothing is more striking in the narrative of McKinlay than that, in approaching the Gulf of Carpentaria, after upwards of eight months of travel not only had he still with him camels and horses,

* Besides the detailed Journals, a very interesting volume has appeared whilst these pages are going through the press, entitled 'Tracks of McKinlay and Party across Australia'; by John Davis, one of the Expedition. Edited by Mr. W. Westgarth. (Sampson Low and Son.)

† Mr. Middleton exhibited some of this sand at the Meeting of the 11th May, which is of so red a colour that he compared it to "Cayenne pepper."

but also that the sheep which were left (soon afterwards eaten) had "their kidneys well covered" with fat, in south latitude 19°, notwithstanding their fatiguing journeys and the long grass on which they fed.

The last efforts of McKinlay and his associates, when traversing a tract in great part hard and stony, to reach Port Denison in the north of Queensland, and after their bullocks and camels had all been eaten, is worthy of all commendation.

The appearance at our last Meeting of Landsborough himself, and of Middleton the companion of McKinlay, enabled us to satisfy ourselves that British colonisation can be successfully extended into Tropical Australia. If mere geographers had made this assertion, their dictum would not have made the same impression on Englishmen and Colonial residents as the positive declarations of two practical men like Landsborough and McKinlay, both of whom began as settlers, and having by their sagacity and conduct made independent fortunes, are surely the best possible judges on this debated subject. These gentlemen have assured us that many thousands of sheep are now thriving within the tropics in North Australia, though we have yet to learn whether these animals will permanently flourish if carried to the northernmost shores of the continent.*

In addition to the discoveries recently brought under our notice, let me refer my associates to the 28th Volume of our Journal for evidences showing the feasibility of establishing British colonies on some parts of the north coast. There they will find, not only the full accounts of the memorable researches of our medallist, Augustus Gregory, after he left the mouth of the Victoria, but also the notes of Mr. Wilson, the geologist of the expedition, who, being left in charge of the camp and having resided there for ten

* Mr. Brodribb, late a Member of the Legislative Assembly of Victoria, has written to me expressing his belief that North Australia will become a great wool-producing country. He shews that there are tracts in the southern parts of Australia less propitious for the breeding of sheep than certain parts which approach to the tropics, and where he has reared many fine ones. At previous Meetings of our Society, Mr. M. H. Marsh, M.P., who is also a large proprietor, has assured us that sheep thrive well in parts of Australia to the north of any tract which was previously pastured, and the rapid extension of flourishing flocks in the northern part of Queensland, which is within the tropics, is an undeniable fact—though the farthest successful limits where sheep can flourish has not yet been ascertained. Mr. Brodribb adds, "The settlers in North Australia will, however, have to procure fresh rams every two years from the colder regions, in order to keep up the weight of the fleece; for the animal, while growing older there, will suit itself to the climate. The wool will retain its fineness but not its weight; it will be light and open, but will not become *hair* as was asserted."

months, gives us as perfect a conception as can be obtained of the nature of the climate, productions, and natives of that intertropical tract. In one part of these notes he says, and Mr. H. Gregory confirms him, that in no part of the world had he seen grass grow so luxuriantly. As to climate, he affirms, after giving tables of the mean temperature for ten months of the year, that, although the maximum temperature in the shade was 106° , and the minimum 47° , the health of the travellers and the animals of the expedition was by no means impaired. Surely, with such statements as these before us, theoretical objections to the selection of chosen parts of North Australia as the sites of British communities ought to cease.

In opposition, however, to these data and the inference to be derived from them, it has been argued that, inasmuch as tracts at about 15 degrees north of the equator, in the peninsula of India and other places in the Indian Ocean, are from their great heat unsuited to European settlement, such must also be the case in like southern latitudes in Australia. But this reasoning seems to me to fail when we consider the distribution of heat over the surface of the globe, according to the law which regulates isothermal lines. Thus, whilst the Indian Ocean is necessarily the source of warmth to the Indian peninsula, the enormous breadth of table-lands with their gum-trees in North Australia must to a great extent cool the temperature; and thus bring about a more moderate climate than on a similar parallel to the north of the equator, where water so vastly predominates over land.

Viewed in this way, theory accords with the facts ascertained by our explorers, who, surmounting all difficulties, have laid open practicable routes across the continent, and have shown us that Tropical Australia can be colonised successfully. Moreover, as Sir H. Barkly well observes, "the Australian air is so comparatively dry even within the tropics, and the forests of gum-trees so free from jungle, that the climate is far healthier and more endurable by European constitutions than in similar low latitudes in other portions of the globe." *

These recent discoveries have further dispelled those theoretical speculations in which, in common with many geologists and physical geographers, I confess I at one time indulged, as to the vast and continuous extent of internal deserts in Australia. From such desponding views I am now relieved; and I congratulate Governor

* Despatch to the Duke of Newcastle, 21st August, 1862.

Gawler and others, who sagaciously contended, that vast interior districts of rich and fertile lands would be found, to compensate for barren intervening tracts. But, whilst in my Address of 1858, I suggested reasons for scepticism as to the extent of rich interior lands, I said that it would ill become the President of this Society to damp the ardour of those researches by which alone the question could be settled; and I expressed a hearty wish that the Colonists might be gratified, as they have been, by the discovery of such large *oases* in the interior.

Nothing, in short, in our age, can be more cheering to the geographer than by taking in hand the Map of Australia published by Arrowsmith in 1842, and contrasting it with one on which our excellent cartographer can now insert all the mighty additions which the explorations of the last twenty years have enabled him to make. In concluding these remarks on the wonderful extension of geographical researches in this continent, let me say that the progress which our enterprising Colonists have made, not only in wealth and material prosperity, but in all that can dignify a people, was strikingly manifested at the last great International Exhibition. In it we saw collocated, not merely the rich natural products of gold and copper, with admirable pictorial views which even enabled us to imagine that we had visited the mines of our antipodes, but we also had before us solid proofs in the publication of excellent Maps and the Catalogues of the valuable Libraries of Sydney and Melbourne, that there is scarcely any branch of knowledge or of industry which is not cultivated in Australia with a zeal rivalling that of the mother country.

Relying on the conversations which it was my privilege to hold with the distinguished men who represented the several Australian colonies on that occasion, as well as with my personal friends who have long resided there, I feel assured that there is no part of the British dominions where the people are more attached to the Sovereign and the British Constitution than Australia. It has always, therefore, been a source of pain to me, when some persons have spoken or written of the coming of the day when these great Colonies are to be separated from us. Seeing no cause for such separation, and believing that our Government and Legislature are much too enlightened to commit the error into which our ancestors fell when Britain lost her North American settlements, we are, I rest satisfied, never likely to estrange our Australian colonists by similar treatment. It has been well said by a late Governor of

South Australia that the loyalty of Australia is 'an homage to the enlightened rule of England, of which her statesmen may be proud.* On my own part, I am indeed persuaded that, if judiciously and considerately treated, Australia, which affords by far the finest possible field for the emigration of our superabundant population, will long continue to be a source of wealth and strength to the mother country; and will, I trust, for ages hold out a proof that the people who live under a constitutional monarchy enjoy much truer freedom than those who have formed part of any democracy, ancient or modern.

In concluding the preceding imperfect analysis of the labours of recent explorations in Australia, I have to express my regret on one point only. I cannot learn that any of the recent travellers have made observations on the relative altitudes of the tracts they traversed, such as those which the indefatigable Mitchell was wont to make in all his surveys. For, whilst I know that Stuart, Landsborough, and McKinlay could not possibly devote sufficient time to any one district they traversed, to delineate, with the accuracy of an admirable surveyor like Mitchell, all its physical contours, still with a thermometer only and the boiling water which they had at every camp, approximate heights could easily have been ascertained. If such comparative levels of the country had been registered, our knowledge would have been greatly increased; and our practical geographers would have had the means of laying down on their works the river systems and drainage of the vast interior.

New Zealand and its Gold.—It is not my province to enter on this occasion into a general review of the progress made in these fine islands in agriculture, mining, trade, and new settlements. I will simply advert to the great stimulus which has recently been imparted to this southern colony by the discovery of gold. As I have no precise information respecting the amount of gold which is yielded in other parts of these colonies, I confine the following few sentences to the auriferous product of Otago. Whilst my friend Dr. Hector has been occupied in tracing out the boundaries of the rock formations of this province, or the Scotch colony, and has been analysing the specimens of earths and ores of the newly-settled parts of it, we learn from the elaborate report of Mr. Vincent Pyke, the Commissioner of the gold-fields, some highly interesting particulars.

* See the Lecture, "Australia: what it is, and what it may be," by Sir Richard G. MacDonnell, C.B., Dublin, 1863.

Although no systematic search for gold was made until 1861, the discovery of the Tuapeka gold-fields attracted workmen and speculators from other parts of the islands, as well as from Australia; so that the revenue of Otago, *mirabile dictu!* was quintupled in one year, having been raised in that short time from 33,500*l.* to 161,744*l.* At the date of this report, 1st October, 1862, we find it stated that, independently of undeveloped tracts, "a continuous gold-field may be said to extend in a general northerly direction from Tokomairiri to the valley of the Upper Clutta, a distance exceeding 100 miles."*

As far as examination of the auriferous region has extended, it would appear that the gold is chiefly found in the younger tertiary deposits, which are made up of the detritus of the subjacent old slaty and quartzose rocks. The latter rarely protrude to the surface in Otago, and do not form, as in Victoria, the visible and striking gold-bearing backbones of the region, into which the miner may penetrate in search of the ore when the gravel, sand, and detrital accumulations shall have been dug out or exhausted. It would appear that, in Otago, these older or original matrices of the gold (my Old Silurian rocks) are much covered up by the tertiary or alluvial accumulations in which the gold is disseminated, and in many parts the hills are covered even to their summits with rich black earth. Hence it follows that, although there may be auriferous detrital matter sufficient to enrich the colony by diggings for many a year, and that the colonists may now only see the beginning of their rich golden harvest, still it would appear that they have not before them the same hopeful prospect of a stout (but in my opinion not permanent) staple like that of Victoria in the outcrop of the original matrices of the gold-bearing slates, into which they may drive shafts and mines.

Whilst the recent discovery of coal in the western part of Otago is also of much importance to the colony, this region of New Zealand has also become most interesting to the naturalist by the report that the gigantic bird, the Moa,† whose bones excited much interest when so admirably described by Owen, is still living there. In

* See Otago Provincial Gazette, November 26, 1862, No. 217.

† My eminent friend, Mr. John Craufurd, informs me that Moa is the name given in the great Polynesian language to the common fowl in the tropical islands of the Pacific which possess it, and seems to have been bestowed on the gigantic bird by the Maoris when they emigrated to New Zealand. In the Polynesian, the generic term for "bird" *manuk* is taken from the Malay, and is found in the dialect of New Zealand.

early days these gigantic birds were masters of the lower, richer, and more accessible regions of these islands. Then came human beings, Maori, from other regions, who killing and eating this noble game, whose bones have been found mixed up with stone knives and other implements, a few survivors found a refuge in the higher, colder, and more sterile tracts of the south. There the persecuted birds might perchance have long remained in solitude, had not the discovery of the precious metal led to a great exodus of miners and speculators, who, having once invaded the wild region, will doubtless soon exterminate the last of the Moas.

Polynesia.—From New Zealand, which was anciently peopled from a part of tropical Polynesia, we may turn for a moment to the clear and animated description of the Fiji Islands, given by Dr. Seemann in his recently published volume, entitled, 'Viti: an Account of a Government Mission to the Vitian or Fijian Islands in the years 1860-61. Acting as botanist and naturalist to the Government expedition under Colonel Smith, which was sent out to inquire into the desirableness or otherwise of colonising these beautiful and fertile islands, Dr. Seemann gives us not only a scientific sketch of their gorgeous vegetation, but also a very lively account of the habits and manners of the natives, a race of the Polynesian negroes, who have only very lately been reclaimed from the cannibalism so strikingly described by Admiral Erskine.*

Africa.—A few weeks only have elapsed since our hearts were oppressed with apprehensions respecting the fate of the Eastern African expedition under Speke and Grant, and by the rumoured death of Consul Petherick, who was *en route* to meet and aid those travellers. I could then scarcely venture to think of touching upon African exploration in my approaching Anniversary Address, so great were my fears respecting the enterprise to which, as geographers, we attached so much importance. Our latest accounts from Speke and Grant had made known to us their position at Kazé, 2° to the south of the Lake Victoria Nyanza on the 30th of September 1861. They had then, after great delays, owing to the infidelity of their porters, who ran off with one-third of their property, just emerged from the wilderness of Mgünda M'khalé; while, to complete our depression, a telegram from Alexandria announced that Petherick, after the loss of his stores, had perished in passing to the west of the White Nile. What then was our joy when, after a long and

* 'Cruise among the Islands of the Pacific.'

painful interval of suspense, a first telegram from Alexandria gave us the grateful news that Speke and party had reached Khartûm; while a second, quickly following, bore from Speke to myself the pithy words, "The Nile is settled!" Then came the cheering intelligence that Petherick was not only alive, but had actually joined Speke and Grant at Gondokoro on the 20th of February last; and, finally, we have been furnished with the journal of the travellers, with a map of the region they explored, illustrated by the determination of many points of latitude and longitude in regions hitherto wholly unknown.

Whatever might have been our recent forebodings respecting the success of the explorers from the east and south, who had met with obstacles unknown to Burton and Speke in their former traverse of that central region, I never, on my own part, gave up the hope that, like many a previous African traveller supposed to be dead, Cónsul Petherick would still be found in life. Owing, however, to his disasters on the White Nile, and the loss of his stores, our agent—who had been liberally supplied with money by us, with a view to succour Speke and Grant when they were struggling to get through a tract where we apprehended that their greatest difficulties would occur—could afford them no important assistance when he joined them at Gondokoro. This is the place, as you will recollect, beyond which the Dutch ladies had reached in their steamer; and had our travellers arrived there some weeks earlier they would, doubtless, have not only been well cared for by these adventurous ladies, but would have been so rapidly carried down by steam to Khartûm that before now we might have had them among us. Real and substantial succour had, however, before Petherick's arrival, been brought to the expedition by that gallant, devoted, and enterprising explorer Mr. Samuel Baker, who, having heard of Petherick's disasters, had fitted out at his own cost a separate expedition, in which he was determined, if he could not relieve our explorers, at all events to try to follow the White Nile to its real sources. Mr. Baker—distinguished formerly by his exploits in Ceylon, and in the preceding season by his researches in the districts north of Abyssinia, also by defining the position and peculiar hydrographical conditions of several affluents of the river Atbara, previously quite misapprehended by geographers—had made up his mind to pass the equator in his southward search after the missing travellers. Pursuing his route to Gondokoro, he was the first to meet the long-

absent parties, and to supply them with money, provisions, and boats. The cordial thanks of our Council have necessarily been voted to Mr. Samuel Baker for his noble conduct; and, as he has now gone off to the south-west in the hope of tracing the extent of a lake on the west, laid down by Speke in his map as the Luta Nzigé, and intending to devote a year to this enterprise, we may confidently hope for a satisfactory solution of this collateral question of the source of a great feeder of the White Nile in a higher latitude. Let it also be recollected that Mr. Baker is not merely a daring explorer, a good naturalist, and a first-rate sportsman, but is also a good geographer, having already made, as I learn from a letter addressed to his friend Admiral H. Murray, numerous astronomical observations fixing the positions of rivers and places.

But, whatever may be in store as to future discoveries, let us, in the mean time, dwell with delight on the grand achievement of Speke and Grant, who, by traversing a region never previously explored by civilised man, have solved the problem of ages; and have determined that the great fresh-water lake Victoria Nyanza, whose southern watershed extends to three degrees south of the equator, is the reservoir from which the sacred Bahr-el-Abiad, or White Nile, mainly descends to Gondokoro, and thence by Khartûm into Egypt.

In tracing the outline of Speke's recent discoveries, I may shortly recapitulate the nature of the problem that was presented to him when he started on the expedition. His previous journey (1858) (at right angles to the route jointly travelled by Burton and himself to the Tanganyika Lake, and undertaken while Burton lay sick at Kazé) led him into a land where small rivulets began to flow northward into a great fresh-water sea, called the Nyanza, of which he fixed the longitude and altitude, as well as the latitude of its southern end. The lake was bounded to the east by the warlike Masai nation, and to the west by the kingdoms of Uzinza and Karagwé, whilst along the northern shore lay Uganda, Usoga, Amara, &c. Speke's furthest point at the southern end of the lake therefore lay, by astronomical observations, about 480 geographical miles south of Gondokoro, the uppermost well-known point on the White Nile, though the exploration of occasional travellers or ivory dealers—as Peney, the brothers Poncet, and mainly De Bono and Miani—had reduced the distance between the nearest points then known to white men to 400 geographical miles. The assertions of travelled Arabs convinced Speke that the outlet of the lake which

gave birth to the White Nile lay far away in the north, between Uganda and Usoga. Speke's present journey was made to ascertain the truth of such information. His main difficulty was presumed to lie in obtaining the goodwill of the powerful chief of Uganda, who was known to be constantly at war with the king of Unyoro, and of such other native potentates as might otherwise block his way; but no great trouble was anticipated in reaching the lake-district a second time.

Our travellers started from the East African coast on the 1st of October, 1860, but the commencement of their journey was most inauspicious. Eastern Africa was parched with drought, and its tribes were at war with the Arabs trading there in ivory. The result was that they did not reach even Kazé without great delays and anxiety, terminating with illness. The next intelligence was dated September 30, 1861, near Kazé, and told a more cheering tale. The travellers were again on the advance, with a sufficient attendance of porters and interpreters, and were hopeful of success. More than a year then ensued without a particle of news, owing to the wars alluded to, when the joyful information, already alluded to, reached England by telegram. There is a short break in our knowledge of their proceedings in the mean time; for Speke sent a despatch by way of Zanzibar, which has never reached the Society. His present reports contain a consecutive narrative of the last and principal part of his journey between Karagwé and Gondokoro. Grant having been left behind sick, Speke commenced on January 1, 1862, his departure from the capital of a kingdom called Karagwé, that abuts by one of its corners against the west shore of Nyanza, at its southern end. Here he seems to have made a most favourable impression on the intelligent King Rūmanika, who gave him friendly recommendations to the powerful King of Uganda. Karagwé is a portion of a peculiarly interesting district. It occupies a shoulder of the eastern watershed of a territory 200 miles broad, and some 6000 feet above the sea-level, studded with detached conical hills, one of which attains the height of 10,000 feet at least.

Two sources of the Nile rise in this territory—namely, the Kitangulé River, which is the chief feeder of the Nyanza Lake, and probably that of another Lake, the Luta Nzigé. So, probably, also does the source of the Shiré of Livingstone, if we may believe the reports now brought to us by Speke; for it seems that the Tanganyika Lake is emptied, and not supplied, by a river at its southern end, and that this affluent feeds the Nyassa Lake, and through it,

of course, the Shiré. The northern feeder of the Tanganyika takes its rise in the land of which we have been speaking.

It is evident, from a part of the present reports, that the missing papers would have enlarged on the fact that in Karagwé, Speke found himself in contact with a superior caste, strongly and favourably contrasting with the negro tribes he had previously seen, and that Uganda, whither Speke now went, was ruled over by a similar race. Their country lies along the Nyanza, and occupies a full half of both its western and its northern shores. The parent stream of the Nile bounds Uganda on the east, as it issues from the middle of the northern boundary of the lake with a stream 150 yards in width, leaping over a fall of 12 feet in height. The Nyanza is said to have other outlets from the same shore, which all converge upon the Nile, and feed it at various points of its course extending to a distance of 150 miles from the lake. The north shore of the Nyanza is parallel to the equator, and about 20 miles north of it.

Our traveller conceives the lake to have formerly extended over a greater area than at present. Its banks are intersected at frequent intervals by what he calls "rush-drains," apparently small half-stagnant watercourses, which drain that portion of the adjacent land which he believes to have been formerly flooded by the lake. The present size of the Nyanza is considerable; it is about 150 miles in length and breadth, but it appears to have no great depth.

Speke further learnt that other lakes have a share in feeding the Nile. One of them, Baringa, lies immediately to the east, connected by a strait with the Nyanza. It supplies the Asúa River, which runs into the Nile just above Gondokoro. The other is the Luta Nzigé, to which we have already alluded, and which Mr. Baker has proceeded to examine. Captain Speke never saw it, but pictures it on his map as being annexed to the Nile. The river enters it, after making a great bend, at the easternmost part of its northern shoulder, and re-issuing at the westernmost part of the same locality. This lake lies 120 miles north-west of the northernmost part of of Nyanza.

Speke describes the people of Uganda as "the French" of these parts, from their sprightliness and good taste in behaviour, dress, and houses. Their ruler is absolute in his power; fortunately he showed great kindness and even affection for Speke. He knew confusedly of the navigation of the White Nile by white men, and had occasionally received their goods in form of presents brought by the northern negroes. He was exceedingly anxious for the establish-

ment of a trading route to Gondokoro, but northern tribes blocked the way.

Speke was detained five months at Uganda whilst waiting for Grant's arrival, owing to the attachment this youthful king formed for his white visitor, who taught his majesty the art of shooting and various other accomplishments, and thus gained much influence at the sable court: his movements were narrowly constrained, to satisfy the king; but he finally gained the ever-doubtful passage to the north, and thence he was passed on to the next kingdom, that of Unyoro, still inhabited and ruled over by the same peculiar Wahuma race, but by a far less advanced portion of them. North of Unyoro the South African family of languages, which had been universal thus far, suddenly ceased to be used, and the northern dialects took its place.

Hitherto Speke had had no trouble about interpreters; for one tongue was understood more or less by persons in every kingdom he passed through. Henceforth he could not advance without Unyoro interpreters. The people, too, were far more barbarous. He saw strangers among them who lived, when at home, in absolute nudity. At Unyoro they adopted a scanty dress, out of deference to the customs of the Wahuma. Speke's troubles and the procrastination of the King Kamrasi, when he was getting to the end of his journey, were most annoying; the barbarian succeeding in taking from him his only remaining chronometer. He contrived, however, to escape and to follow the Nile for 120 miles north of the great lake, or to lat. 2° N. There the river falls rapidly and makes its great bend to the west, to pass through the Luta Nzigé Lake, and Speke was obliged to travel along the chord of the bend, a distance of 70 miles. He again struck the river at De Bono's ivory station, in lat. $3^{\circ} 10' 37''$, and found he had descended 1000 feet.

A large body of Turks (ivory traders) were the only occupants of the station when Speke arrived, and they welcomed him cordially. After some days, the camp broke up, and marched to Gondokoro, Speke accompanying it. They passed, in north latitude $3^{\circ} 35'$, the tree on which the Venetian Miani had cut his name to mark the extreme point to which that traveller had penetrated. The Turks compelled the Bari natives to contribute porters; and I am sorry to add that the narrative fully confirms the universal accounts of the inhuman treatment of the natives by these Turkish traders. Our traveller reached Gondokoro on the 15th of February, and there met Mr. Baker.

In his retrospect of the more civilised countries he had visited, namely, the three kingdoms of Karagwé, Uganda, and Unyoro, Speke unhesitatingly gives the preference to the first-named, inasmuch as the King Rumanika is described as a person of character and intelligence. M'tese, the sovereign of Uganda, is an amiable youth, surrounded by his wives, and delighting in field sports; while one of the rules of his court would seem to require the execution on an average of one man per diem for the good of the State. The northernmost of these three kings, to the north of whose dominions language wholly changes, is described as a morose, suspicious, churlish creature, yolept Kamrasi, whose chief occupation was the fattening of his wives and children till they could not stand, and in the practising of witchcraft. Our travellers spent a whole year in getting through these three kingdoms, in no one of which had a white man ever been seen before; nor would our friends, in all probability, ever have escaped from the royal clutches had they not supplied their majesties with numerous presents, and had not the kings eagerly desired to open a traffic with the whites.

The question of the sources of the Nile has occupied geographers and travellers from the remotest periods of history; and when we come down to the period of the Romans, we learn from Seneca that Nero sent up two centurions to settle it, but the Roman captains returned without accomplishing what our two countrymen have effected. Lucan, indeed, in his 'Pharsalia' makes Julius Cæsar speak thus at the feast of Cleopatra:—

"Sed cum tanta meo vivat sub pectore virtus,
Tantus amor veri, nihil est quod noscere malim
Quam Flavii causas per secula tanta latentes,
Ignotumque caput: spes fit mihi certa videndi
Nilivæ fontes; bellum civile relinquam."

It is not, therefore, for us only as geographers to rejoice on this occasion; but our country should be proud of such a feat as has been achieved by the two gallant officers of the Indian army; and I have no doubt that when the recitals of their toils and journeys are made known, as well as their graphic description of interior native kingdoms of whose names we never heard, they will be greeted with the same approbation of the public as that which was so justly bestowed on my valued friend Livingstone after he had traversed Southern Africa. Let us hope that Speke and Grant may reach these shores before the last day of meeting, on the 8th of June; but should this not occur, the Council of the Society

have already authorised me to call a special meeting, in order that we may gratify the public, and do honour to ourselves, by having their precious discoveries communicated to the Society by the authors in person.

In the mean time it is highly gratifying to know that our Authorities at home have been prompt in offering to these distinguished men every requisite succour. Earl Russell, with the same alacrity as when he assisted Lieutenant (now Captain) Pim to traverse Siberia in search of Franklin, has transmitted a sum of money in aid to Alexandria. The Oriental and Peninsular Company have liberally granted a free passage to Aden or Bombay to the twenty-three black attendants of the explorers; for without such assistance the poor creatures could never have reached their homes near Zanzibar. Again, the Secretary and Council of India have, at our request, at once extended the leaves, with Indian pay, of Captains Speke and Grant to the 1st of July, 1864, in order to free them from embarrassment, and enable them to publish full accounts of their researches. In communicating this circumstance, and in authorising me to send the news by telegram to Alexandria, our Associate, Mr. Under-Secretary Merivale, thus writes: "I wish the telegraph could also conveniently carry the expression of our Indian satisfaction at the great achievement which these officers have performed, and our pride that we, the Indian Service, have beaten Julius Cæsar." I may here state, that the telegram I sent to Alexandria on Thursday was answered on Saturday by Mr. Saunders, Her Majesty's Consul at Alexandria, in these pithy words:—"Speke and Grant reached Thebes and Kineh.—Telegram of Leaves just received here." As, therefore, our travellers are now far below the Cataracts, and in steamers of the Viceroy, we may very soon welcome them at home.

When the full narrative of this expedition is laid before the public, you will then have the perusal of a most graphic, and in many parts an amusing account of the customs and habits of various peoples of whom we never heard before, and of the character and power of kings, to traverse whose dominions required such a continual exertion of tact, vigilance, and resolution, as have proved the leader of the expedition to be as good a diplomatist as he is a gallant soldier. Looking at Speke only as a practical geographer, we of this Society owe deep obligations to him. For he has determined by astronomical observations the latitude and longitude of all the important sites which he visited; and, in transmitting these to us, accom-

panied by a variety of meteorological data, has expressed a wish that these should, if possible, be calculated and compared by competent authorities before he reaches England, and before his map is published. On this point, I am happy to say, that Mr. Airy, the Astronomer Royal, has, with his well-known love of our science, undertaken the important task.

When delayed in the interior, Captain Speke occupied his leisure hours by writing a history of the Wahuma, otherwise (as he believes) Gallas, particularly in reference to the portion of that nation that crossed the Nile and founded the large kingdom Kittara, which is bounded on the south by the Lake Victoria Nyanza, and its affluent the Kitangülé Kagera; on the east by the Nile; and on the north by the river-lake Luta Nzigé; and on the west by the kingdoms of Utumbi and Nkole. These names, as well as those of the kingdoms of Karagwé, Uganda, and Unyoro, were only made known to geographers by hearsay from Arab merchants in Speke's first journey; while no historian has heretofore heard of the dynasties which Speke enumerates, among whose kings we read of Ware the 7th and Rohinda the 6th, while one of the descendants of these sovereigns is at present found possessed of from 300 to 400 wives.

Not wishing, however, to do more on the present occasion than to stimulate your desire to listen to a fuller narrative at a future meeting, I must be permitted to read the very words of Speke, when, at the end of the long pilgrimage of himself and his companion, he fell in at Gondokoro, on the 15th February last, with Mr. Samuel Baker, who was travelling onwards to assist him. "The meeting," says he, "of two old friends suddenly approaching one another from opposite hemispheres, without the slightest warning, can be better understood than described: we were intoxicated with joy, though my good friend had inwardly hoped till now to find us in some fix from which he might have relieved us. Baker had one *dyabia* and two smaller vessels, stored with corn, which he at once placed at our disposal. He also lent me money to pay the way to Cairo, and finally supplied our *dyabia* with many little delicacies for our comfort. He was our saviour, if not in the interior, at any rate on the Nile." Nor can I here omit to notice the paragraph in Speke's first letter to myself, in which he says, "I may safely say I never felt so rejoiced as when Petherick delivered your letter announcing that the Royal Geographical Society had awarded to me the Founder's Medal."

The determination of the reservoir from which the Nile flows will enable us to speculate with more certainty than before on the regular periodicity of the rise of this stream in Egypt; and which is now generally attributed, not to the melting of the snows of the higher chain to the east, but, in far the greater part, to the fall of the equatorial rains on the interior spongy upper basins, which, when supersaturated, must fill to overflowing the lakes into which the waters pass, the periodicity being determined by the passage of the sun over the equator. And here I cannot but observe that if there be any persons who adhere to the old-fashioned erroneous belief that the interior of Africa is a mountainous sandy desert, from which the sources of the Nile are derived, the discoveries of Burton and Speke, and of Speke and Grant have as completely dispelled the illusion respecting the equatorial latitudes, as the journey of Livingstone put an end to a similar false hypothesis in the southern part of this great continent.

Modern discovery has indeed proved the truth of the hypothesis, which I ventured to throw out to you eleven years ago, that the true centre of Southern Africa is a great elevated watery basin, often abounding in rich lands; its large lakes being fed by numerous streams from adjacent ridges, and its waters escaping to the sea by fissures and depressions in the higher surrounding lands. It was at our anniversary of 1852,* when many *data* that have since been accumulated were unknown to us, that, in my comparative view of Africa in primeval and modern times, I was led to suggest that the interior of that continent would be found to be such an unequally elevated basin, occupied now, as it was in ancient geological periods, by fresh-water lakes, the outflow of which would be to the east and to the west, through fissures in subtending ranges of higher mountains near the coast. While this theory was clearly verified in Southern Africa by Livingstone in the escape of the Zambesi, and is well known to be true in the passage of the Niger, through deep rocky gorges, so does it apply to the Nile, in as far as the great central lake, Victoria Nyanza, is ascertained to occupy a lofty plateau 3,500 feet above the sea. Again, as the southern end of this lake extends to the water-parting between North and South Africa, and in its range northwards is only fed by small lateral affluents flowing from the flanking higher grounds, so the waters issuing from the northern end of the Lake Victoria Nyanza, and, forming the White

* President's Anniversary Address 1852, vol. xxii., p. cxxi.

Nile, take advantage of a series of depressions, through which they descend in a succession of cascades. The uppermost of these cascades, close to the lake, has been named, after my predecessor (now Earl de Grey and Ripon), "The Ripon Falls." Thenceforward, the White Nile, fed by other affluents as it flows to the North, has a descent of 2,400 feet, when it reaches Khartūm, which is itself 1,100 feet above the sea. The general course of the Nile, from south to north, and its peculiarity as a stream, in having no affluent between the Atbara River and the sea, a distance of 1,700 miles, has been in the first instance dwelt upon by the great Abyssinian traveller, Bruce, and has since been ably illustrated by Sir Henry Holland.* The phenomenon of its being confined to this northward course is due to the fact, that the flanking higher grounds, ranging from south to north, do not afford, as in Southern Africa, lateral valleys which lead to the sea. The other generalizations which have been established by Speke and Grant, independently of the true source of the White Nile, are—

1. That the hypothetical mountain-chain, which has been called the "Mountains of the Moon," and which on old maps has been represented as traversing the equatorial regions of Africa from east to west, exhibits no such range. According to Speke, the only high land seen was simply a separate interior cluster of hills, from which descend some small western feeders of the Lake Victoria Nyanza. In fact, these mountains occupy the higher part of the central watershed between North and South Africa. Now, as they supply the Victoria Nyanza, and, consequently, the Nile, with some of its western waters, they may also send eastern contributions to the river Congo. To the south there seems little doubt indeed but that their waters flowed into the Lake Tanganyika of Burton and Speke, and thence into the Nyassa of Livingstone, as had been, indeed, inferred, on what seems to me very sound reasons, by Mr. Francis Galton.†

2. That the inhabitants of the kingdoms of Karagwé and Uganda, in the central and equatorial parts of Africa, are much more civilized and advanced than the people who live to the north, on the banks of the Nile, between the Lake Victoria Nyanza and Gondokoro, the latter being for the most part those naked barbarians, probably the

* Edinburgh Review, Oct. 1854. Alluding to the mysterious unsolved problem as to the true origin of the Nile, Sir H. Holland then justly said, that "the man who makes the discovery will perpetuate his name to all future time."

† See Earl de Grey and Ripon's Anniversary Address, 1860, p. clx. "Africa."

anthropophagi of Herodotus, who have doubtless been the real impediments during all ages to explorations up the stream, or from north to south.

3. We learn that some acquaintance with the language of the natives on the east coast enabled the travellers to hold converse with many individuals in all the tribes and nations they passed through until they reached the above-mentioned northern barbarians, whose language is quite distinct from any dialect of Southern Africa.

4. From the notes of Speke on the geological structure of the countries he passed through, I infer there is little or no hope of any portion of those regions proving to be auriferous. I direct attention to this fact; since an erroneous notion has crept into the public mind, derived probably from the possibly gold-bearing character of some mountains extending southwards from Abyssinia, that a gold region existed near the sources of the Nile.

* In this Address I cannot pretend to do justice to the writers from the early days of Herodotus to the later period of Ptolemy, as well as to many modern authors who, referring to those ancient works, or obtaining information from natives, have assigned the origin of the Nile to lakes in the interior of Africa.* We are told by Cooley, in his 'Geography of the Great Lake of Southern Africa,'† "that above three centuries have elapsed since accounts of a great sea in the interior of Africa reached the Portuguese settlements on both sides of that continent." It is probable that from this information was constructed the old map of the sixteenth century, which exists in the library of the "Propaganda Fede," in Rome, and in which the Nile is represented as issuing from an equatorial lake.‡ Already in 1518, adds Cooley, we find it stated as a fact, learned from the natives of Congo, that the River Zaire rises in a lake in the interior, from which issues in another direction another great

* Colonel Sir Henry James informs me that in Lelewel's 'Géographie du Moyen Age' (Brussels, 1830), there is a map taken from the Arabian work called 'Rasm,' which map was copied by Abu Diafar Mohammed Ben Musa, A.D. 833, by order of the Calif Almamoun. This map is therefore upwards of 1000 years old; and on it the source of the Nile is represented as being in a lake called "Kura Kavar," situated on the Equator, an island in it being represented as in longitude $32^{\circ} 40'$ E. This agreement to so great an extent with modern discovery is truly remarkable.

† Journal of the Royal Geographical Society, vol. xv., p. 185.

‡ A small copy of this large map taken by Lieut.-Gen. Jochmus von Catignola is in our Apartments. In a letter from Rome, dated July 3rd, Monsignor F. Nardi, Prelate of the Pope's Household, informs me that this fine and large old map was constructed by one Jerome Verrazano, probably a brother of the celebrated Florentine geographer John Verrazano, who was sent out by Francis I., King of France, to explore a part of North America.

river, presumed at that time to be the Nile.* Again we learn from the same learned, critical geographer, that De Barros tells us of the great lake in the centre of Africa, "whence issue the Nile, the Zaire, and the great river, the branches of which encompass Benomotopa, besides many others that are nameless."† Such information, gleaned from native sources, it has been reserved to our times to verify or disprove by actual observation. The one or more great lakes of the old authors have now been separated by explorers into several great water-systems; and it is to that of the White Nile, as fed by the great reservoir of the Lake Victoria Nyanza, that our present attention is called.

And here we must give due credit to our Abyssinian medallist, Dr. Beke, who, in the year 1848, threw out an original hypothesis‡ respecting the sources of the Nile, which the journey of Speke and Grant has proved to be substantially correct; § and on which he has dilated at the meetings of our Society, and in letters to myself.

It is not my province to enter now into a general discussion on the relative merits of the writings and maps of critical geographers upon Africa, nor to endeavour to show how in the south-east the recent observations of Livingstone may have substantiated or modified the ingenious views of Cooley, the practical sagacity of Arrowsmith, or the laborious analyses of Macqueen. The source of the White Nile is the question before us, and on that point we know that, when (1858) he was associated with Burton, Speke discovered and named the great Lake Victoria Nyanza. Nay, more, he assured

* Fernando de Enciso, *Suma de Geografia*.

† Asia, Decad., l. xi.

‡ Transactions of the Sections of the Brit. Association, 1848, p. 63.

§ In this Address, delivered on the 25th May, which, hastily written, was printed in the *Times* of the following day, there are *errata*, particularly in reference to the writings of Mr. Cooley and Dr. Beke, which I have endeavoured to correct in the text. As respects Africa, my main object was to convey a clear and popular view of the journey of Speke and Grant. I am aware that various opinions prevail among sound critics on the geography of the interior of Africa; and I profess to be wholly incompetent to side with Cooley, Lacaze, and Pigafetta, or Burton, on the one hand, or with Macqueen or the other African authorities, such as Beke, Erhardt, Speke, &c., on the other. On the following points of comparative geography, however, I must do Mr. Cooley the justice to say, that he has satisfied scholars that the Blue Nile was *the* Nile of the ancients (though we now know that it is merely an affluent of the much greater White Nile)—that Greek geography can be traced with certainty to Palta on the east coast of Africa, and, as stated in the text, that the Mountains of the Moon do not belong to the genuine text of Ptolemy. (See Dr. Smith's *Ancient Geography*). Though unprepared myself to go into the relative merits of our African critical geographers (not forgetting the Inner Africa of Cooley and his original Map, the Memoirs and Maps of Macqueen, Beke, and others), I should wish to see clear abstracts of their writings placed before us in a future Number of our Proceedings; for such a repertory would be highly interesting, and also useful to practical geographers and explorers.

us, in 1859, when he determined its position, that it would prove to be the true source of the Nile; and that problem of ages he has himself now settled by actual survey. For all the speculations of geographers as to the main source of the Nile remained to be confirmed or set aside by actual observation.

As to the "Mountains of the Moon," they are, according to Cooley, an Arab interpolation, and do not belong to the genuine text of Ptolemy, Amedi, &c. Amid the mountains of tropical Africa, we may hesitate to apply that designation with Burton to the group which Speke views as such, i. e., w.s.w. of the Lake Victoria Nyanza; or, on the other hand, to agree with Dr. Beke in considering as such a north and south chain on the east, which, as he supposes, may unite the lofty peaks of Kilimandjaro and Kenia with mountains in Abyssinia. Even those two views need not exhaust this prolific subject of theory; while they and other speculations may serve geographers a good turn as useful stimuli to future explorers.

In dwelling on the fact that all efforts to ascend the Nile to its source have failed, I must do justice to those geographers who have shown the way as to the desirableness of exploring the interior of Africa from the coast near Zanzibar and Mombas. First, I have to record that in the Session of 1838-9, Captain W. Turner, R.N., suggested to our associate Mr. W. Bollaert and the late Captain Ormsby of the Indian Navy, that the three should go to Zanzibar, thence to explore the country to the great lakes then called *Maravi*. Their plans were submitted to Mr. Cooley, who even wrote out a list of instructions, whilst the Royal Geographical Society as well as the Government offered assistance. This expedition was put an end to by the employment of both the naval officers; and Mr. Bollaert most unwillingly relinquished the project, and went to Texas to explore portions of a country, the regions to the south of which he has since so well described. Next we have to bear in mind the efforts of those enterprising German missionaries, Krapf and Rebmann, who, advancing from Mombas to the foot of the great mountain Kilimandjaro, announced the startling phenomenon that these very lofty mountains, though under the equator, were capped by snow. The truth of this observation has since been completely realised by the very remarkable actual survey of Baron C. von Decken when accompanied by the geologist Mr. R. Thornton, as well as by subsequent ascents by the former to the height of 13,000 feet. Then Erhardt read a memoir before our Society, illustrated by a map compiled by himself and Rebmann, of a vast tract of Eastern Africa. It was

based on numerous caravan routes and included an enormous lake stretching from the Equator down to the lake Maravi. Next, our associate Colonel Sykes earnestly advocated the operating from Zanzibar,* as an excellent base for all geographical researches in the adjacent continent. I must further state that, as early as 1848, Dr. Beke projected an expedition to the Zanzibar coast, of which Dr. Bialoblotsky was to be the leader. As great prejudices then existed against these suggestions, on account of the supposed inevitable loss of life to any European who should sojourn there, the more have we to thank those of our associates who advocated a line of research, which has led first to the expedition of Burton and Speke, and eventually to the actual discovery of the source of the true White Nile.

I may also say, with no small pride, that from first to last the Council of this Society has vigorously sustained African expeditions, whether in southern or northern latitudes; and I am well entitled to state that in the absence of our persistent representations to Her Majesty's Government, for whose support and countenance we are indeed deeply grateful, the discoveries of Livingstone, and of Burton and Speke, and the great recent discovery of Speke and Grant, which now occupies our thoughts, would not have been brought about in our day.

The introduction of a small steam-vessel on the waters of the White Nile has enabled a party of lady-tourists to effect its navigation, with an ease that astonishes those who had experienced the grievances of the usual means of transport. Not only was the time of passage reduced to a small fraction of its former amount, but the rapid and independent movements of the steamer withdrew her passengers from the risk of those native hostilities which had become a serious danger to the navigators of the White Nile. At the same time that Mr. Baker, warned by the universal experience of the ivory-traders and previous travellers, had pointed out the necessity of a powerful escort to secure ordinary safety, the three ladies, Madame Tinné and her daughter, and her sister Madame van Capellen, steamed in their little vessel to Gondokoro, and beyond it, with a scarcely more numerous attendance than would have assured their personal comfort in the most civilized parts of Egypt.

The energy of these ladies, the daughters of the celebrated Dutch Admiral van Capellen, the coadjutor of Lord Exmouth at Algiers,

* See Journal of the Royal Geographical Society, vol. xxiii. p. 101.

induced them to extend their voyage up the Sobat, which they describe as a river of importance only during the period of high waters. We had previously been gratified with their lively accounts of the country even to the south of Gondokoro; and we have recently heard of their making a new expedition from Khartūm to the Bahr el Ghazel, in the hopes of penetrating some of the affluents of that great mere. They were at the same time doing an additional service to geographers by conveying the exploring party of Dr. Heuglin to their point of departure from the shores of the same lake. I have twice called the attention of the Society to the exploits of these ladies, the youngest of whom, Miss Alexine, is a naturalized Englishwoman: I will only repeat what I have said at one of our Evening Meetings, that they well deserve to be honoured in an especial manner by the Royal Geographical Society. Dr. Heuglin has already thrown great light on the geography, in its widest sense, of the northern parts of Abyssinia; and the linguistic studies of his original colleague Dr. Munzinger have resulted in the collection of eight new vocabularies.

Little is known with certainty of the result of Von Beurmann's endeavour to penetrate Wadai. He appears to have reached Lake Tsád, and there to have awaited permission to proceed. Further rumours have reached Bengazi; but intelligence of a definite character is anxiously waited for.

M. Jules Gérard has sailed to the West Coast of Africa with the object of penetrating Dahomey and Ashanti, and of making such further explorations as opportunity may admit, by passing through the interior to Sierra Leone. The Council of this Society have encouraged his strongly-expressed desire to collect geographical information by the loan of a small but serviceable outfit of instruments. They have also furnished him with instructions in respect to the routes by which, in their opinion, he might most profitably travel, but have in no wise become responsible for the expenses of his expedition.

M. Paul du Chaillu has announced his immediate intention of again starting for the Gaboon, now adequately prepared to map his future journeys; and I confidently hope that by the study he has recently gone through, he will be enabled to make accurate astronomical observations, and add materially to the value of his published work which has so much interested the public of England, France, and America. I must add that M. du Chaillu having freighted a ship at his own cost, and having provided himself

with all the requisite instruments and stores, has expended in this generous effort nearly all the money he obtained from the sale of his work, and has therefore our warmest good wishes.

The Baron C. von Decken had again started, and again been foiled in penetrating the interior of Africa by the way of Mombas. The territory of the Massai appears to be absolutely closed to strangers, at least in that direction. The Baron, as before stated, ascended Kilimandjaro to a height of 13,000 feet, where he experienced a fall of snow, the first that has been endured by any white man, rarely even by a black one, in tropical Africa.*

In general African geography, maps of the whole of the continent, introducing recent discoveries, have been published by Mr. Arrow-smith, and also by M. Ravenstein. The large sheets of Dr. Petermann are all issued, with the exception of those that unite the Lake Nyanza and Gondokoro, which have awaited the results of Speke's expedition. The scale of these charts of Dr. Petermann is sufficient to admit of the insertion of numerous geographical notes and references, whereby it becomes a valuable index to the authorities whence it has been compiled, in addition to its merits as an ordinary map.

Dr. Barth's valuable vocabularies, to which attention was drawn in the last Anniversary Address, are on the point of completion. That able and energetic geographer, who now worthily fills the chair of the Berlin Geographical Society, has published a great

* After the Anniversary Meeting I received a letter from Baron C. von Decken written in the Seychelles Islands, and dated May 12, 1863. This most enterprising Hanoverian traveller was then on his way to Madagascar with the intention of returning to Zanzibar and Mombas, to continue his explorations in Eastern Africa. The object of his letter was to obtain from the British Government some efficient countenance, and a little assistance from our ships of war; inasmuch as the Sultan has been inimical to all his efforts. It appears that Baron von Decken is procuring a steamer of his own, in which he proposes to ascend the river Juba if he can once get his vessel over its dangerous bar. In his last journey Baron C. von Decken was prevented from traversing the Massai country and reaching the northern snowy mountains (Kenia) by that route, and he now intends to ascend one of the rivers which fall into Pormosa Bay, i. e. the Dana, Osi, or Sabaki, and the Juba. If he is enabled to proceed 100 or 150 miles up any one of these rivers, he hopes to succeed not only in reaching the Kenia Mountain but also the Lake Baringo and other interesting points. Our German cotemporaries may well be proud of this noble and devoted explorer, who, they may be quite sure, will have the heartiest support of the Royal Geographical Society and its President, and, as I can now add, of Her Majesty's Government. This enterprise of Baron von Decken will, if successful, throw a clear light on the relations of all the eastern affluents of the Victoria Nyanza and White Nile, of which Speke has brought us home knowledge as derived from the natives. In the mean time, Captain Speke is decidedly of opinion that the Kilimandjaro snowy peak is separated from the Victoria Nyanza by salt lakes and plains, and throws off its chief waters to the east by the Pangani River. The Kenia snowy northern peak may, however, he thinks, contribute water to the Lake Baringo, and thence by a channel may swell the Nile at the north end of the Lake Victoria Nyanza.—*July 1st, 1863.*

mass of information, in a compendious tabular form, which bears on the periods of rise and fall of the rivers of North Africa, and the corresponding state of the rains and winds. The subject is of interest, partly because the means of intercommunication among the natives and their daily pursuits are largely dependent on the condition of their rivers, but mainly owing to the fact of its offering some acceptable glimpses into the hydrology of little known regions.

LIVINGSTONE.—The proofs obtained by Livingstone that the Rovuma was too shallow a stream to be used in commerce were communicated by my predecessor; and a second expedition to that river enabled the indefatigable traveller to ascend that stream in a boat, and ascertain that it has its source in high lands, and not, as was at one time imagined, in the northern end of the great Lake Nyassa.

After his visit to the Shire River, and his return to the Zambesi, Livingstone had the happiness of being joined by his devoted wife, after an absence of four years; but in three months, alas! she followed the fate of the good Bishop Mackenzie and his Archdeacon. The touching letter of my friend to myself on this bereavement, and which was read before the British Association at Cambridge, in September last, must have deeply affected all those who knew, as I did, how devotedly the great traveller was attached to that excellent woman.

The extraordinary efforts made by Livingstone to get his boat up the tract watered by those falls of the Shire which he named after myself, followed by his extraordinary labours and courage in ascending that river and the Lake Nyassa, and his subsequent unwearied labours to transport his small steamer in pieces up the banks of the Shire, where that river descends in cataracts to the Zambesi, as well as the devoted energy of the pious Bishop Mackenzie and his reverend associates, are all to be recorded as proofs of the heroic resolution of our countrymen.

I had, however, been for some time aware that both the Zambesi and its affluent the Shire were localities little fitted for the stations of Christian pastors, from whence religion might be successfully extended. Whilst the malaria on the banks of the Zambesi renders any residence on them most dangerous, the evidences obtained by Livingstone and his brother Charles, were, that although the higher country up the Shire was healthier, yet that the various tribes of the inhabitants were continually at war with each other,

a fact of which sacked villages and the frequent bones of the victims of war were the too palpable evidence. Alas! we also know too well that, in the very first efforts to select missionary stations, that excellent man Bishop Mackenzie found himself compelled to side with one tribe against another, and to be thus engaged in actual warfare! Again, I learned with sorrow, that, in Livingstone's efforts to suppress the slave-trade, in the interior, he had been grievously thwarted by the underhand conduct of certain slave-traders, who followed him into tracts which he had opened out, transporting as slaves many unfortunate natives.

Seeing that all these operations, whether missionary or philanthropic, must be carried on by acting from a base where no British colony exists whence real support could be derived, and also referring to the untoward circumstances to which I have adverted, I was quite prepared to learn that Her Majesty's Secretary for Foreign Affairs should have put an end to a Consulate the main object of which was to suppress the slave-trade. However, therefore, we may regret the withdrawal of our energetic Medallist from the scene of his successes, and before the complete exploration of the Nyassa has been accomplished, we who are sincerely attached to him may rejoice in the prospect of welcoming him on his return to Britain, after making such vast additions to our acquaintance with the geography of Central and Eastern Africa—additions which, without his sagacity and indomitable energy and endurance, might not have been obtained in our day.*

CONCLUSION.

In concluding this Address, I must advert to the changes which take place among our Officers at this Anniversary.

The bad state of health of my distinguished friend General Portlock has, I regret to say, necessitated his retirement from the office

* In reference to what is said above on the subject of Livingstone's explorations, I learn by a letter recently received from him that, instead of returning home, my indefatigable and truth-loving friend has determined to re-ascend the Shire, and work out the problem of the true source of that stream and his great Nyassa Lake. The British public ought, however, to be informed that in his anxiety to extend his researches—and by so doing check the slave-trade as carried on across the Shire—Livingstone had expended 6000*l.* of the earnings derived from the sale of his work, in the purchase of a small steamer, intended to navigate that stream. Now, as that sum was of great importance to his motherless children, I earnestly hope that he may be reimbursed, at all events to some extent; the more so as the Consulate, from which he derived only 500*l.* per annum, is at an end. My forebodings as to the helpless state of the University Mission on the Shire have, alas! been but too fully realized.—July 22, 1863.

of Vice-President. Through the resignation of the post of Honorary Secretary by Mr. Francis Galton, we lose the official duties of a sound geographer, who obtained one of our Gold Medals for his travels in the south of Africa, and who of late has been the able unsalaried Editor of our Proceedings. Though out of office, I venture to hope that he will continue to give us his aid and advice in the Council, particularly as he is the only person in the list proposed who is personally acquainted with the geography of Africa.

In the retirement of the Acting Secretary, Dr. Norton Shaw, the Society is deprived of the services of a zealous and efficient administrator; and the Council have therefore taken the opportunity of marking their sense of the value of his long services in the manner recorded in the Report which has been read to you. I must further do justice to Dr. Shaw by reminding you that, when he was first placed in office, our Members were under 700, and that at present they are about 1800. As I have also had some share in endeavouring to swell these numbers, and in spreading the reputation of the Society, so am I bound to add that, on every occasion when the sympathies of the public were to be united with our own in any good cause which the Fellows of the Geographical Society had espoused, the energy of Dr. Shaw was conspicuous. Thus, I may particularly cite two Meetings over which I presided. The first of these was the gathering which was called to raise a fund to honour the memory of the gallant French officer Bellot, who was lost in the search after Franklin; the other, the organisation of the great festival given to my dear friend Livingstone on his last departure for Africa. The marked success of both these Meetings was unquestionably due in great measure to the heartiness with which Dr. Shaw urged each project. Again, as the Editor of the Volumes of our Journal and of our Proceedings during many years, he has for a long time been identified with the reputation which our publications have obtained. On these various grounds, therefore, I only do justice to the retiring Acting Secretary, in saying that for such essential services he has obtained our cordial thanks.

In reorganising the Administrative Officers of the Society on a new basis, the Council has deemed it desirable for the permanent advancement of our scientific reputation, that we should follow the system which has been found to work best in the Royal, Linnæan, Geological, and other scientific Societies. The essential change made is, that the two so-called Honorary Secretaries are henceforward to resume the titles of Secretaries (as was the case for many

years after our foundation), and are to act as the efficient Executive Officers, who, under the President and Council, shall transact all the scientific and other business of the Society. On this head I feel quite confident, if Mr. W. Spottiswoode and Mr. R. Clements Markham be, as the Council have suggested, elected to fill these posts, that our best anticipations will be effectively carried out. Under them, the Assistant Secretary will have to perform parts only (and quite enough for any one man) of the numerous avocations of Dr. Norton Shaw; his principal duties will be those of Editor of all the publications, and superintendent of the Assistants and subordinate officers of the establishment.

Finally, let me say that, if I am enabled to conduct your affairs during the ensuing year, I trust that I shall, at its close, be able to announce to you, that there has been no diminution of the prosperity to which we have attained. I must, however, add that the term of my two years of Presidency will then have been completed. And, when I remind you that, if I live till the next Anniversary, I shall have acted as your President for nine years—and that on many other occasions I have also been seated in this chair to do the duty of your absent Presidents—I know that, however great my shortcomings may have been, you will admit that I have zealously served you; whilst I can truly assure you that this service has been a source of the deepest gratification to myself, since I have invariably met with your hearty support.

The capabilities, however, of doing effective service have their limits in the life of any man; and you must not think of changing your rule of biennial Presidencies in my favour, as some of my kind friends have suggested; for I feel that I cannot in a future year undertake, in addition to official and other occupations, this most honourable duty.

Pray, therefore, look to the coming year when I must take leave of you in the capacity of a President, and select some one as my successor, who shall be worthy of the high distinction of presiding over you,—one who will value this privilege as I do,—and who will strive, as I have striven, to promote the best interests and true advancement of the Royal Geographical Society.

PROCEEDINGS
OF
THE ROYAL GEOGRAPHICAL SOCIETY.

SESSION 1862-63.

Fourteenth Meeting, Monday, June 8th, 1863.

SIR RODERICK I. MURCHISON, K.C.B., PRESIDENT, in the Chair.

PRESENTATIONS.—*Mr. Geo. Cockle and Mr. Gillet.*

ELECTIONS.—*His Royal Highness the Count de Paris; the Earl of Belmore; Sir John P. Boileau; Hutchinson Browne, Esq.; John Brunton, Esq.; Walter Buchanan, Esq., M.P.; Frederick Burdock, Esq.; Thos. F. Callaghan, Esq.; the Rev. G. H. Clements; Edward Clowes, Esq.; S. W. Courtenay, Esq.; M. P. Edgworth, Esq.; Thos. F. Hall, Esq.; G. F. Heneage, Esq.; Charles J. Leaf, Esq.; Sir Thomas Davies Lloyd; Captain Lovell; Viscount Milton; W. Wincoode Reade, Esq.; R. H. St. Andrew St. John, Esq.; Francis Snowden, Esq.; Dr. George E. Spikernell; John Taylor, Esq.; the Hon. Henry P. Vereker; Henry Waite, Esq.; Charles Noel Welman, Esq.; Wm. Octavius White, Esq.; also Lieut.-Colonel the Chevalier Sonklar von Instätten as Honorary and Corresponding Member.*

ACCESSIONS.—Among the donations to the Library and Map-rooms since the former meeting were—'Vancouver Island and British Columbia: Where they are, what they are, and what they may become;' by Alexander Rattray, M.D. 'A Short Explanation of the Sketch of the Analytic Universal Nautical Code of Signals;' by Count d'Escayrac de Lauture. 'Considerations on the Phenomena attending the Fall of Meteorites on the Earth;' by Professor W. Haidinger. 'The British Shipmaster's Handbook to Rio Grande do Sol;' by the Hon. H. P. Vereker, LL.D.; and 'Transactions of the Zoological Society,' Vol. iv. Part 7, and Vol. v. Parts 1 and 2. Maps of British India; Africa (South), sheet; Philip's Atlas, Part 15.

EXHIBITIONS.—Numerous specimens of birds from the Malay Archipelago, and diagrams illustrative of the Papuan and the Malay races.

In opening the business of the evening, the PRESIDENT said he had the pleasure of announcing that he had received a telegram, stating that Captains Speke and Grant left Alexandria on the 4th current, in the steamer *Pera*. They were due at Southampton on the 17th, and the Council of the Society had decided upon having an extra Meeting to receive them, on the evening of the 22nd.

While upon the subject of Africa, he might state that he had further intelligence of Madame Tinné and her daughters, the adventurous ladies, who, after having gone up the Nile as far as Gondokoro, whence they returned to Khartûm, had started afresh in their steamer for the Bahr-el-Ghazal, the great western affluent of the White Nile. The following letter had been received from Madame Tinné, and was read by the President:—

“21st March, 1863.

“Here we are, come to a stop again; that is, as far as we can go in the steamer on the Bahr-el-Ghazal. We are near to an island which Petherick calls Kyt, but the natives call it Misr of Reg. Its longitude is $26^{\circ} 45'$ E. of Greenwich.” [This may probably be depended upon, as Mr. Von Heuglin and his companion, both scientific men, are of the party.] “The Bahr-el-Ghazal is more like a very narrow canal. There is little to say of it. It winds through high grass and bulrushes; large plains, with huts and flocks at a distance, and nothing else. This is a very difficult place to come to, as the river, though deep, is choked with rushes and a soft-wooded sort of tree, which breaks as our ships pass, but is very formidable to look at. The leaf is the same eternal mimosa-shaped leaf, and it bears a large yellow flower, like broom, and very sweet-scented. We came through it with the steamer, having the paddles taken off. Our learned friends have found 60 curious new birds, and an unknown fish, as well as several new flowers and plants. Mr. Von Heuglin and the Doctor have made some valuable observations. No one the least scientific seems ever to have been here before us.

“We have no porters yet, but we are going on shore to see what can be done. It will now be long, very long, before I can write again; but we have a very good medical man with us, so we feel as safe as in Europe. As to our return to Khartûm, it may be soon, but it may be long. This depends on the time the rainy seasons set in in the parts we are going to visit; but as no one has been there yet, of course we cannot know. Mr. Baker went into a part of Abyssinia previously little known, to hunt elephants for six weeks, and they were detained nearly a year before they could travel, on account of the rain and mud! We are decidedly late in the season, and we may be overtaken in the same manner; but do not be alarmed; we have two scientific men to guide us, and about seventy or eighty soldiers, well armed, to guard us, besides our good reputation, and the idea of your sister being the Sultan's daughter, travelling on a ship of fire!”

The PRESIDENT said he had also to call attention to the circumstance that M. du Chailu, who was about to make another exploration into the interior of Africa from the west coast, had taken great pains

to instruct himself in making correct astronomical and geographical observations, and had provided himself with instruments. He had also at his own expense freighted a ship to take him out to the river of Fernand Vaz, $1^{\circ} 10' \text{ s.}$, and 9° E. He had resolved on going alone, with plenty of instruments and an ample supply of presents for the natives; and he was determined to prove to the English public, that, though many of his observations might not be geographically correct, yet his published work was as a whole essentially truthful. He (the President) rejoiced at this determination, and he need not say that he wished M. du Chaillu complete success in his exploration.*

He might further announce that there was a communication from Earl Russell, consisting of two despatches from Mr. Consul Callander, of Rhodes, to the Foreign Secretary, relating to the great earthquakes which visited that island in the spring. The first despatch, dated April 27th, gave an account of the earthquake on the night of the 22nd of April, the shock of which was felt at about half-past ten, and lasted about three-quarters of a minute. The movement was apparently from west to east, and the shock was so severe that there was not a building in the island which was not more or less damaged. The fine tower of St. Michael, called the Arab's Tower, at the entrance of the harbour, was partly destroyed, as well as the tower of St. Nicholas, on which the lighthouse stood. About thirty houses in the town, and as many in the suburbs, were destroyed, and thirteen individuals killed. Out of twenty-six villages, from which information had been received, thirteen were entirely destroyed and the remainder partly ruined; and about 100 individuals killed and as many wounded. The little village of Massary ($36^{\circ} 10' \text{ N.}$, $28^{\circ} 6' 30'' \text{ E.}$) 20 miles s.w. by s. of Rhodes, and one mile from the coast, was reduced to a heap of ruins; 126 bodies had at the date of the first despatch been dug out of the ruins, and the condition of the survivors, who had been driven into the fields without shelter, was aggravated by an abundant rain which fell for two days after the earthquake.

The second despatch, dated May 2nd, gave additional particulars. From official information 224 people had been killed throughout the island, and 124 wounded. The number of houses destroyed in twenty-one villages, out of the forty-four in the island, amounted to 1377. An *aide-de-camp* of the Sultan had arrived on board an Imperial corvette, entrusted, it was said, on the part of His Majesty the Sultan, with 500,000 piastres (5000*l.*) for the relief of the sufferers, and another steamer with tents was shortly expected.

The paper of the evening, the President ventured to say, was as remarkable a contribution as had been laid before the Society for a long time. It was the production of one of our most eminent naturalists, Mr. Wallace, who had spent seven years in the Indian

* M. Du Chaillu took his departure from Gravesend on the 5th of August, 1863.

Archipelago. He had previously communicated valuable papers upon Borneo and other subjects, which were printed in the Transactions of the Society. The paper had, geographically speaking, quite a unique character, for the author, judging from the nature of the animals and plants that are found in these different islands, showed how and when former continents must have been separated from each other, and how the respective *floræ* and *faunæ* of ancient continents are now to be found almost within a few miles of each other.

The Paper, which was entitled,—

On the Physical Geography of the Malay Archipelago,

was then read by Mr. MARKHAM, Secretary.

MR. WALLACE, after briefly glancing at the importance of his subject, which, he said, furnished the most extensive and varied materials for speculation in almost every department of scientific inquiry, proceeded to classify the topics treated of in his paper, the first section of which consisted of a tolerably precise determination of the limits of the Archipelago, with data as to the position, extent, and magnitude of the principal islands; the great object being to define the eastern boundary of the region in question, where, unless due care be taken to verify its limits, geographers are apt to conceive that it blends insensibly with the various Pacific groups usually classed as Polynesia. This archipelago—for which he proposed the name Indo-Australian in lieu of Malay—he held to extend from the Nicobars on the north-west (Mr. Wallace did not mention the Andamans), to San Cristoval, one of the Solomon Islands, on the south-east; and from Luzon on the north, to Rotti, at the south-west angle of Timor, on the south; being an irregularly triangular area of $29\frac{1}{2}^{\circ}$ latitude, by 69° of longitude. For ethnological and other purposes stated in the paper, the Malay peninsula, though a portion of the mainland, is included in this insular belt; and analogous reasons induced the determination of the eastern limit. After strongly advocating the insertion in all future atlases of a special map of these islands, comprising so many varieties of man, so many different tribes, and such variety of physical phenomena as to entitle it almost to be regarded as the sixth great division of the globe (Australia being the fifth), Mr. Wallace alluded to the immense number of active and extinct volcanoes (the islands in which the former occur being unusually liable to earthquakes), as also to the immense forests which, throughout a great portion of the Archipelago, clothe even the loftiest hills to their summits; while in other portions these give place to arid hills and plains scantily covered with scrub. The meteorological phenomena display similar

contrasts, some of the islands experiencing the monsoons with the utmost regularity, while others show an inconstancy of climate resembling our own. But the most marked feature of the physical geography of the region is to be found in the fact that one large section is connected by a very shallow sea with the continent of Asia, while a similar submarine plateau unites another portion to Australia; the intervening belt of ocean being almost unfathomable.

Mr. Wallace then subdivided the islands into—I. Volcanic, and Non-Volcanic; II. Forest Country and Open Country; III. Well-marked Seasons and Undefined Seasons; and IV. Western, or Indo-Malayan Region; and Eastern, or Austro-Malayan Region.

As to the first, Borneo and Celebes formed two central masses, round which the volcanic islands are distributed in a band about 5000 miles in length, roughly conforming to their outline, and comprising about 50 active volcanoes. Throughout this entire length are to be found, at innumerable points, most convincing evidences of frequent upheavals and depressions of land, especially of upraised coral reef. In strong contrast is the island of Celebes, throughout its singularly-complicated form, the great mass of Borneo and the whole Malay peninsula, which, like Celebes in this respect, have absolutely no volcano, active or extinct; and there is a similar quiescent area, 1000 miles wide, in the great island of New Guinea, where no volcano is known to exist nor earthquake to occur, in an island which Mr. Wallace estimates to contain 290,000 square miles, or 53,000 more than Borneo, hitherto regarded as, after Australia, the largest island in the world. Still further to the east occur a few small active volcanoes.

The author then noticed the variations of soil, and endeavoured to account for the extraordinary configuration of Celebes and Gilolo, which have been variously accounted for, but which he did not feel disposed to attribute to volcanic action (there being but a few volcanoes at the extreme northern end of Celebes), but rather to the alternation of forces acting in opposite directions, which nearer home have been known to raise and depress large tracts of land several hundreds of feet within comparatively short geological periods. He then briefly stated his reasons for believing Borneo to have been long stationary, before proceeding to touch upon the contrasts of vegetation and climate, which he proposed to consider together, and of which he gave numerous most interesting particulars, tracing their varying features to climatic and other influences.

He next adverted to the change of the seasons, which in many

parts seems, at first sight, to follow no known law, though an accurate and prolonged series of observations would doubtless enable us to determine them.

"Speaking generally," said Mr. Wallace, "the whole southwestern part of the Archipelago, including the whole range of islands from Sumatra to Timor, with the larger half of Borneo and the southern peninsula of Celebes, have a dry season from April to November, with the south-east monsoon. This same wind, however, bends round Borneo, becoming the south-west monsoon in the China Sea, and bringing the rainy season to Northern Borneo and the Philippines. In the Moluccas and New Guinea the seasons are most uncertain. In the south-east monsoon, from April to November, it is often stormy at sea, while on the islands it is very fine weather. There is generally not more than two or three months of dry hot weather about August and September. This is the case in the northern extremity of Celebes and in Borneo, whereas in Amboyna July and August are the worst months in the year. In Ternate, where I resided at intervals for three years, I never could find out which was the wet and which the dry season. The same is the case at Banda, and a similar uncertainty prevails in Menado in Celebes, showing, probably, that the proximity of active volcanoes has a great disturbing meteorological influence. In New Guinea a great amount of rain falls, more or less, all the year round. On the whole, the only general statement we can make seems to be, that the countries within about 3° on each side of the equator have much rain and not very strongly-contrasted seasons; while those with more south or north latitude have daily rains during about four months in the year, while for five or six months there is almost always a cloudless sky and a continuous drought."

The Paper now passed to the consideration of the geological formations and zoological products, and broadly stated it as a recognized fact that one portion of the Archipelago is entirely Asiatic, while the remaining portion is quite as distinctly Australian. With the additional information since obtained, Mr. Wallace combated a theory advanced by Mr. Windsor Earl in a Paper read before the Royal Geographical Society in 1845, in which that gentleman argued from the existence of shallow seas between the mainland of Asia and the immediately adjacent islands at one end, and of a similar shallow sea uniting Australia with New Guinea at the other, that Australia was once part of Asia. Mr. Wallace remarked, that had Mr. Windsor Earl been better acquainted with the natural history of the various regions, he would not have advanced a proposition "to which the whole bearing of the facts in physical geography and

natural history is opposed." In support of this view, he briefly discussed the relations of the geographical distribution of animals and plants with geology; and claimed that the same changes in geological distribution of land and water, of which we have so many evidences in our present acquaintance with the constituents of the earth's crust, are still going on. Hence we shall find that wherever upon islands contiguous to each other or to a continent animals or plants of the same or closely analogous descriptions are observed, it will be found, upon investigation, that the sea between them is decidedly shallow; and by parity of reasoning, that where a deep sea divides islands from each other, there entirely different types will be found. While enlarging upon this branch of his subject, he pointed out that an upheaval of only 50 fathoms would, to judge by soundings, make dry land of the whole sea intervening between Borneo, Java, and Sumatra, and the mainland of Malacca and Siam, while the 100-fathom line of similar soundings includes the Philippines and other groups; from which fact he argues the comparatively recent submergence of this part of Asia, which he ascribes to violent volcanic action. He then adduced a variety of arguments from the zoological world, instancing examples both of *carnivora* and *ruminantia*, which are common to the islands named and to Southern Asia, while they are totally unknown to Australia, yet which could never have reached the islands of the Western section from the mainland of Asia, so long as the ocean retained its present configuration.

After noticing a few anomalies observable in the Philippines, which could sufficiently be accounted for by the more remote period at which they were cut off from Asia as indicated by the greater depth of the intervening ocean, Mr. Wallace proceeded to apply a similar chain of reasoning to the islands from Celebes and Lombok eastward, which he showed to present all the characteristic features of having been united to Australia, as indicated by the shallow sea between, and the similarity of fauna and flora between the Eastern section of the Indo-Australian Archipelago and Australia, as evidenced by two Tables (which will appear in the Society's 'Transactions').

Starting from this point, the writer then proceeded to demonstrate that the dividing line between these may become so narrow that a few miles only may carry the traveller from one great division of the earth (as measured by dissimilarity of productions) to another; and, in proof of this, instanced the Strait, barely 15 miles wide, between Bali and Lombok, which marks the dividing line between the Asian and Australian kingdoms of Natural History. From

these various *data* he drew the general conclusion that all the islands eastward of Borneo and Java formed part of an Australian or Pacific continent, from which they were separated at a period, not merely long antecedent to the submergence of the adjacent portion of the Asiatic continent, but probably long before any portion of South-Eastern Asia emerged from the waves; basing the conclusion upon the comparatively recent geological formation of Java and Borneo, and on the great depth of the sea between Borneo and the Eastern section of the Archipelago, which, upon his theory, pointed to a very remote period at which the two continents of Asia and Australia were separated.

He invited particular attention to the fact that the division of the Archipelago which he had pointed out did *not* correspond to any physical or climatal divisions; that the volcanic band runs through both sections; and that the climates of Borneo and New Guinea are very similar; yet that, in spite of these, which are usually deemed the necessary conditions for ensuring similarity, of animal life, the most striking contrast between them respectively at once forces itself even upon the most unobservant traveller. He then illustrated the difference between these two sections of the Archipelago by speculating as to what would be the consequence of the two continents of Africa and South America becoming joined in the course of ages by the slow upheaval of the Atlantic bed; the erosive agency of rivers on either continent, and other similar causes, followed by a sudden violent divulsion along the axis of what had been the ocean. If, then, a renewed period of upheavals occurred, islands would have been formed similar to those of the Indo-Australian Archipelago, yet equally dissimilar as to Natural History. The Paper concluded by urging upon naturalists increased devotion to that science, as tending to throw light upon many of the most recondite questions of the earth's previous history.

The PRESIDENT remarked that as a geologist, he must say, in all the years he had had the honour of being connected with the Society, he had never heard a paper read of a more luminous character, and which so bound together in the most perfect forms all the branches of the science of natural history, more particularly as it developed the truths of geography upon what he considered to be its soundest basis, that of geological observation and analogy. He was perfectly certain there was no person present, who could not say that they had never sent a traveller into a foreign country, who had more completely studied all the grand features of its natural history, or who had combined them together in a more profoundly philosophical spirit.

Mr. CRAWFORD said the subject of the Malay Archipelago had been the study of his life; but he felt himself much enlightened by the paper of Mr. Wallace. He did not know that he could add any information. He might not entirely agree with all his theories, and, perhaps, not even with his divisions of the Archipelago; but for all that, his paper was a most enlightened

and a most able one. He wished Mr. Wallace had said something about the human inhabitants of these regions. Mr. Wallace knew more about them than any Englishman, for he had lived among them; and he should be glad to hear his opinion of them. He divided the Archipelago into two parts, the Indian portion and the Australian portion. Now he wished to ask Mr. Wallace, seeing that he conjoined Australia and New Guinea as part of the same region, how it happened that the human inhabitants were totally different? Again, if the Indo-Malay portion of the Islands were grouped with India, how came it that no two human beings could be more unlike than the Hindoo and the Malay? How did the Malays come there? How were the dwarfish inhabitants of the Andaman Islands to be accounted for? for there were no such people in India—that was certain. How were the pigmy negroes of the Malay Peninsula to be accounted for? There were differences here which he (Mr. Wallace) might perhaps be able to reconcile. Mr. Wallace had mentioned the eruption of the mountain Tomboro. He was himself old enough to have been an eye-witness of the commencement of that eruption, probably the most remarkable one on record. In the year 1814 he proceeded with an expedition to the island of Celebes; and as they approached the island of Sumbawa, which contained this famous mountain, they thought they saw a very heavy squall coming on. They were beating up against the south-east monsoon, and as they approached they saw that it was a volcano. As they beat up nearer the shore of the island, the ashes fell on the deck. That was one whole year before the great eruption took place. He was then at Soerabaya, at the eastern extremity of Java, about 300 miles distant from the mountain of Tomboro. For three days it was pitch dark. Mr. Wallace had greatly underrated the extent of ashes that were ejected, which were certainly not confined to an area of 300 miles, as they fell at Bencoolen, 1200 miles distant, transported thither by the south-east monsoon; and they were carried by a second current of air a thousand miles in an opposite direction, as far, in fact, as the island of Banda. For ten days he had to write by candlelight; and the country-people were compelled to travel into the country with flambeaux. For six weeks together they could not see the plain disc of the sun. There was one difference between the volcanic and non-volcanic portions of these islands. Generally speaking, the volcanic part was highly fertile. Mr. Wallace had given a just eulogy of the island of Java. He himself resided on that island six years, and he was tolerably well acquainted with it. Java was about half the size of Great Britain; it was a fertile island, beautifully watered, and at present contained a population of full 12,000,000; indeed, the last accounts make it about 13,200,000. On the other hand, he did not believe the population of Borneo exceeded four or five inhabitants to the square mile, and probably on the whole did not exceed one million and a quarter. If Borneo were as fertile as Java, as well watered, and as suitable to maintain a population, it ought, according to its immense size, to contain a population of 80,000,000. The people of Java were civilised, having fine monuments and a literature. The whole of the inhabitants of Borneo, who were not strangers, were savages. There was a still more remarkable example. Mr. Wallace had mentioned the islands of Bali and Lombok. Now, those two very small islands were highly fertile, and although they were not above one-eightieth part of the size of Borneo, they contained a population equal to that of Borneo, and a civilised population too, well-clothed and well-fed, and possessing a literature. These were striking differences between the volcanic and non-volcanic islands.

Mr. WALLACE said with regard to the question that Mr. Crawford had asked, why he did not refer to the races of men inhabiting these islands, it was simply because his paper was already too long, and it would require another paper equally long to do justice to the subject.

Mr. CRAWFORD.—Will you promise one?

Mr. WALLACE.—Certainly. He should just like to say a word with regard

to the number of very difficult problems that Mr. Crawford had proposed to him—problems which, as Mr. Crawford, who had devoted his whole life to the subject, was unable to answer, it was not likely he should be able to answer upon such short notice, if indeed at all. However, he would say, generally, that the races of man do not correspond at all accurately to those two great divisions of the Archipelago, which differed so remarkably in their natural productions. The reason why they did not correspond appeared to him to be simply this; that man is a migratory animal and continually moving about. We had a great deal of historical evidence of the number of changes of the races of man in the Archipelago itself. Some races have been driven out; others have come in; others have made conquests; others have gone to more fertile regions. Therefore, the races of man would not correspond to those of animals and plants. Still there was a slight general correspondence. There was the Malay race, the whole of which, generally speaking, corresponded to the western half of the Archipelago; they did stretch into the eastern half, but not a great part of it. The Papuan race occupied the eastern half, and extended into New Guinea. It was probable they had extended still further west, but they had been driven back by the Malayan race.

The PRESIDENT, in adjourning the Meeting, congratulated them upon having had from Mr. Wallace a proof that Geography as a science embraced all the sciences relating to Natural History. He had proved himself not alone a first-rate naturalist, but also a good geologist.

The Meeting then adjourned, after a cordial vote of thanks had been unanimously passed to Mr. Wallace for his most interesting and instructive paper.

Fifteenth (Special General) Meeting, Monday, 22nd June, 1863.

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

As already mentioned in the record of the Proceedings of the Meeting of the 8th June, it was on that occasion announced by the President, (v. ante p. 204), that Captains Speke and Grant were at latest accounts on their way home from the scene of their splendid discoveries; and those gentlemen having in the interim landed at Southampton on the 17th June, notices were immediately sent out from the Offices of the Society, calling a Special General Meeting for the above evening.

ELECTIONS.—Sir Alexander Gordon Cumming, Bart.; R. H. Davies; Edward Francis Dayrell; Gardner D. Engleheart; Alexander Fergusson, Esqrs.; Major-General Alexander Peto Le Mesurier; S. P. Low; Alexander McArthur; John Remington Mills, M.P., Esqrs.; Sir Robert Phillimore; Russell Brooke Robertson; Thomas F. W. Walker, M.A.; Swinburne Ward; and John Westlake, Esqrs., were elected Fellows.

DONATIONS.—Admiralty Charts and Ordnance Maps; Maps of Belgium, presented by Mr. Ph. Vander Maelon, of Brussels.

EXHIBITIONS.—Views of Napoleon Falls, Lake Nyassa, and nu-

merous photographs of natives and scenery along the line of Captain Speke's route, from Zanzibar to Gondokoro; spears and shields, &c.

The President having entered the Hall, with great difficulty forced his way to the chair. He would not, he said, commence the proceedings until Captain Speke had been placed on his right hand, and Captain Grant on his left, which arrangement was effected with no little difficulty.

In introducing Captains Speke and Grant, the President said :—

GENTLEMEN, we are now specially assembled (for our regular Session has terminated) to do honour to the two men who have accomplished the most remarkable geographical feat which has been performed in our time, and one which it has been the ambition of other nations to accomplish during all ages. The Council of this Society has the greater reason to be proud of this achievement, because it was by their exertions that the means were obtained to carry it out; and Her Majesty's Government and the Indian Government must also have a real gratification, in reflecting that they complied with the wishes of the geographers who organised the East African expedition, in furnishing the essential means of accomplishing it. But, Gentlemen, whilst we may dwell with satisfaction on the encouragement we warmly offered, let us at once turn to the man without whose earlier as well as recent labours, this great feat could never have been brought about—I mean, of course, Captain Speke. In the year 1858, when serving with our former medallist, Burton, and when that eminent explorer lay sick at Kazeh, Captain Speke, having heard of this lake from Arab merchants, hastened to reach it, and finding that its southern extremity was on the high plateau-land, between 3000 and 4000 feet above the sea—the land which forms, indeed, the watershed between North and South Africa in that meridian)—and finding also that the waters of this vast lake were fresh, he, then and there, after accurately determining the longitude of its southern end, was convinced that this body of water must be the great southernmost reservoir, out of which the White or Main Nile flowed at its northern end. It was for this great discovery that the Royal Geographical Society awarded our founder's gold medal to Captain Speke. Though obliged to return to England with his leader, Captain Burton, Captain Speke held pertinaciously to his project; and engaging his Indian brother officer, Captain Grant, to accompany him (an officer, let me say, who distinguished himself, and was severely wounded in the great Indian mutinies), and encouraged by this Society and the Government, he has gone and accomplished the great deed, and has fol-

lowed the Nile from its sources to its mouth. Gentlemen, it is not for me to recapitulate any portion of that abstract of vast labours gone through by Captains Speke and Grant, which I read to you at our anniversary. But I think it necessary to say that I now know that, in my anxiety to satisfy the desire of the public, there were omissions and errors in that Address. I know, for example, that I did not on that occasion do sufficient justice—and I am sorry for it—to able critical geographers, who had framed hypotheses, or had collated data from natives and other authorities, as to the probable source of the Nile; but I beg you to consider that I was then solely bent on developing, as well as I could, from the records sent home by Speke, the main features of the great actual and practical survey which had been made by himself. As to the statements which are arising and will arise as to the dates of the old maps on which lakes were marked in the interior of Africa, and out of which the Nile is made to flow, they are not confined to the old (probably Portuguese) maps of the 16th century, of which I spoke, and which exist in the library of the Propaganda Fede in Rome. One Arabian map is now indeed cited, which is upwards of 1000 years old, in which one or more pieces of water occupy very nearly the position of the Victoria Nyanza of Speke. Not pretending to be able to decide upon who may have been the people who first were acquainted with such great interior waters, Captain Speke informs me that he believes the traders from Hindostan were probably anterior even to the Greeks in visiting this region. When, however, we come to the latter, Captain Speke is of opinion that that great geographer, Ptolemy, is the authority who first placed upon historical record the existence of African lakes under the Equator, out of which the Nile flowed. But age after age rolled on: traveller after traveller, from the days of the Roman emperors to our time, endeavoured to ascend the Nile to its source, and all have failed. In our days, one Miani, a Venetian, who had lived many years in Egypt, is the person who got farthest southward in ascending from Egypt; and he, not being an astronomical observer, thought, and has asserted, that he had reached to the second degree of north latitude, where he cut his name upon a tree. He has even written to me from Vienna what he calls a "protest" against the river of Speke being the true Nile. Speke, however, in passing southwards, determined the latitude of that very tree, with Miani's name on it, to be $3\frac{1}{2}^{\circ}$ N. latitude; and as Speke has traced the waters of the Nile from 3° S. of the Equator, it follows that the Venetian was never within about 400 miles of the head waters of the Nile. As it would be impossible, on this occasion, for Captain Speke to carry you along with

him on this long pilgrimage which he and his companion made from Zanzibar; on the east coast, to the central and equatorial kingdoms in which they were so long detained, he will now first read to you a brief sketch of the whole course of the great White Nile; and will show you how vastly superior it is, not only in length, but also in volume and importance, to all the affluents which it receives from the east or from the west, including the great Blue Nile. Cavillers about the source of the Nile there are, I know, in abundance; and such persons will probably not even be satisfied by assuring them that Captain Speke himself does not talk of the source; but he tells you that, whilst the southernmost end of the Lake Victoria Nyanza does not receive waters from the south, that great body is fed by numerous small streams which flow into it from the west and the east, as it extends northwards; the great fact remaining, that the southernmost end of this lake is on the watershed between North and South Africa, and in $3\frac{1}{2}^{\circ}$ s. latitude. Before I call on Captain Speke to read his communication on the Nile, I must acquaint my associates with the deep interest which our Patron the Queen and our Vice-Patron the Prince of Wales take in this discovery. When, along with other Royal Commissioners, I recently waited upon the Queen in the deserted building of the International Exhibition, Her Majesty was pleased to congratulate me most graciously upon this great geographical feat, and I feel certain from the kind and emphatic manner in which the Queen expressed herself on this, the first time on which Her Majesty had appeared after her sad bereavement, that she is truly proud in the reflection that two of her own gallant Indian officers should have succeeded in doing what the people of every European nation have failed to accomplish. Then as to our Vice-Patron, the Prince of Wales, I know that His Royal Highness, who is himself a great traveller, and who loves our science, would have been here this evening had not a very special engagement prevented him; but arrangements have, I am happy to say, been made by which His Royal Highness will hear, to-morrow night, a lecture from Captain Speke, at the Royal Institution. Whilst our own Royal family recognises the importance of this great discovery, the King of Italy has taken the lead amongst foreign sovereigns in the expression of his desire to commemorate this great discovery, and has directed two gold medals to be struck in honour of our heroes of the Nile. One of them, or that which is destined for the leader, has arrived, and has on it the inscription, "Honor a Nilo." I must here add that the letter of the Italian Minister, the Marquis d'Azeglio, which accompanies this appropriate reward, is such an elegant and apposite composition, that it is worthy of the country which reared a Columbus. Its tenour is as follows:—

MONSIEUR LE PRÉSIDENT,

49 Grosvenor Street, 22 Juin, 1863.

Le Roi Victor Emmanuel, à qui les grandes choses qu'il fait pour son pays ne font pas oublier le progrès des sciences partout où ils se manifestent, en apprenant les découvertes relatives aux sources du Nil, vient de décerner deux médailles en or : l'une au Capitaine Speke, et l'autre au Capitaine Grant.

Ces voyageurs, dont on ne saurait assez admirer la résolution et la persévérance, viennent de résoudre l'un des problèmes géographiques que depuis des siècles les savans avaient vainement cherché à pénétrer.

Le Gouvernement du Roi, en me chargeant de vous informer de ce qui précède, Monsieur le Président, vient s'adresser à vos bons offices pour la transmission à destination de ces médailles qui vont m'être expédiées de Turin.

L'empressement qu'on a montré à donner cette distinction à Messieurs Speke et Grant est la meilleure preuve du grand intérêt que l'on porte en Italie aux succès de ces hommes dévoués, qui au milieu de mille périls prolongés pendant des années, suivant sans faiblir une idée et un but, n'ont songé qu'à porter en avant la civilisation et à élargir le domaine de la science.

Il est naturel que ces chaleureuses sympathies existent dans la patrie de Christophe Colomb, qui fit preuve de toutes ces grandes qualités des hommes exceptionnels pour démontrer la vérité de ses calculs, quant à la découverte de l'Amérique.

Nous savons donc apprécier ces qualités, si éminentes dans ce pays-ci ; une volonté déterminée, une patiente persévérance, et le désir du progrès.

Je suis charmé qu'une occasion aussi agréable se présente pour me mettre en rapport une fois de plus avec vous, Monsieur le Président, à qui tant de travaux scientifiques ont fait dans le monde savant une position si élevée ; et je vous prie d'agréer l'assurance de ma haute considération.*

M. D'AZEGLIO.

* *Translation of the above Letter.*

MR. PRESIDENT,

49, Grosvenor Street, 22nd June, 1863.

King Victor Emmanuel, who amid his great achievements for his native land is not unmindful of the march of the sciences wherever cultivated, has immediately on learning the nature of the discoveries relative to the sources of the Nile, decreed two gold medals : one for Captain Speke, the other for Captain Grant.

These travellers, whose resolution and perseverance it is impossible sufficiently to admire, have succeeded in practically elucidating a geographical problem, which the learned men of all ages have vainly endeavoured to solve.

His Majesty's Government, while instructing me to inform you, Mr. President, of the preceding fact, take the same opportunity of requesting your good offices in transmitting to their destination the medals in question, which are about to be forwarded to me from Turin.

The readiness which has been displayed in conferring this distinction on Messrs. Speke and Grant is the most convincing proof of the deep interest felt by Italy in the success of these devoted men, who, amid a thousand dangers extending over years of hard travel, have without faltering followed one idea, and had but one aim, and have thought of nothing but advancing civilisation and enlarging the domain of science.

It only remains for me to add that the French Geographical Society (like our own Society) having awarded a gold medal to Captain Speke for his original discovery of the great lake, he, in grateful remembrance of that act, named a large channel at the head of the Victoria Nyanza after the Emperor Napoleon, who will, I doubt not, duly appreciate the honour of having had his name affixed to such an important feature in the heart of Africa, and by such a distinguished British geographer. I now call on Captain Speke to read his communication.

Captain SPEKE, who on rising was greeted with enthusiastic applause, then read the following Paper:—

"In attempting to describe the extent and character of this great river, compared with its tributaries within the limits of actual inspection by myself, I will first treat of its head, the Victoria Nyanza, from its southern extremity, which I found by astronomical observation, in 1858, to be close on 3° s. of the Equator, and gradually bring it down to its point of *débouchure* in the Mediterranean Sea, 31° n. of the Equator; by which, it will be seen, the Nile represents, considering it lies almost in a direct line from south to north, a total in round numbers of 2000 geographical miles in length, and is therefore nearly one-tenth the circumference of the globe. It must be borne in mind, however, that my observations respecting this great river are not the result of one expedition, but of two; that I have not actually followed its banks from head to foot, but have tracked it down, occasionally touching on it, and even navigating it as occasion offered, for the barbarous nature of the African lakes forbids the traveller doing as he likes; therefore, to give full weight to any inferences I may draw, deduced from what I have only seen in part, I shall blend native information with my own experiences, and in doing so shall hope to teach others what I know, and, beyond that, what I believe myself. In the year 1858, when I discovered the Victoria Lake, which is the great reservoir of the Nile, I found it a large sheet of sweet water lying on the main level, or from 3000 to 4000 feet above the sea-level of the

It is natural that such ardent sympathy should make itself felt in the native land of Christopher Columbus; himself an example of those great qualities peculiar to exceptional men, of which he availed himself to demonstrate the soundness of those calculations which led to the discovery of America.

We therefore know how to rate at their true value the eminent qualities of this country; the determined will, the patient perseverance, and the zeal for true progress.

I rejoice that so agreeable an occasion should have occurred to place myself once more in communication with yourself, Mr. President, whose scientific labours have secured for you in the learned world so distinguished a position, and I beg you to accept this assurance of my marked consideration.

M. D'AZEGLIO.

great interior of Equatorial Africa, looking for all the world like the source of some great river; so much so, indeed, that I at once felt certain in my own mind it was the source of the Nile, and noted it accordingly. To add to this impression the natives, who there only know it by the name of the Nyanza, which equally means lake, pond, and river, described its extension in this confused manner to the northward as being boundless, whilst its breadth really—in fact its circumference—was enormous: greater, if anything, on the east than on its western side, for the negro informants knew the names of all the countries surrounding the lake, and must, had they understood the value of geographical definitions, have been able to separate the river Nile from the Nyanza, and to reduce their explorations to some common understanding. Other informants, Arab merchants and their slaves, residents of Zanzibar, who penetrate Africa in quest of ivory, who had completed the whole circuit of the Nyanza, not individually but separately, some on one side and some on the other, assured me the Nyanza was the source of some great river, they knew not what, though they had heard confused accounts from the natives living on the Equator, of the European ivory-merchants who frequented the Nile in vessels at 5° N. latitude, and had further heard through the same channel that with the rising of the Nile, and consequently the increased violence of its waters, islands were floated down its surface, which really is the case, not composed of earth and stone, but tangled roots of trees, rushes, and grass, with even sometimes huts upon them, which, otherwise undisturbed, are torn away by the violence of the stream and carried down, perfect floating islands. Then, again, these men described the territory between the Nile and Asua rivers as an island on the one side and the land composing the ancient kingdom of Kittara, according to their acceptation of the word as an island, also being nearly circumscribed by the Kitangulé and Luta Nzigé rivers, in conjunction with the Lake Nyanza and the Nile. No merchants, however, had crossed the first parallel of north latitude; none understood geography. They heard what the natives said, but could not fully comprehend them, and thus it was that a doubt still existed in everybody's mind but my own as to the origin of the Nile, which no one would believe until I went again and traced the river down from head to mouth. Had I been all alone in the first expedition, I should have settled the Nile in 1859 by travelling from Unyanyembi to Uganda with an Indian merchant Musor Mzuri, who was prepared to go there; but my proposal having been negatived by the chief of the expedition, who was sick at the time, and tired with the journey, I returned to England, and, to my inexpressible delight, the very first day after

my arrival here, found in Sir Roderick Impey Murchison a warm advocate, who proposed to the Royal Geographical Society to complete what I had before begun; and, as may be imagined, I could not rest satisfied until the world accepted my own views, happily now verified by the indisputable evidence of actual inspection and astronomical observation, that the Victoria Nyanza is the great reservoir of the Nile. Suffice it now to say, after returning to Unyanyembi (the old point), 3° s. of the lake, in 1861, I struck upon a new route, which I imagined, from the unsophisticated depositions of the ivory merchants, would lead me to a creek on the westerly flank of the Nyanza, situated on the southern boundary of Karagwé. Geographical definitions were here again found wanting, for, instead of the creek to the great lake appearing, a new lake was found, called Luero-lo-Urigi, or White Lake of Urigi, which formerly appeared to have contained a considerable amount of water, but is now fast drying up. Its head lies in Urundi, and, circling round the south and east flanks of Karagwé, in form a mountain valley, is subsequently drained by the Kitangulé River into the Nyanza, but not in sufficient quantity to make any sensible impression on the perennial contents of the Nyanza basin. It is to the west and south of Karagwé that the lake receives its greatest terrestrial supply of water, through the medium of the Kitangulé River, which, in draining the aforesaid Luero-lo-Urigi, drains off the superfluous waters of many minor lakes, as the Akenyara in Urundi; the Luchuru, which is the second of a chain including the Akenyara; the Ingezi and Karagimé; and the little Winandermere, which in Karagwé lies below the capital on its south-eastern corner. None of these lakes are large—mere puddles in comparison to the great Victoria Nyanza; but still the Kitangulé, after receiving all their contributions, is a noble river, low sunk like a huge canal, about 80 yards across, with a velocity of about 4 miles an hour, which appears equal to the Nile itself as soon as it issues from the lake by the Ripon Falls. The question naturally suggests itself, What forms these lakes?—whence originate their waters? It is simply this: the Mountains of the Moon, in which they lie, encircling the northern end and the Tanganyika Lake, are exposed to the influences of the rainy zone, where I observed, in 1862, no less than 238 days out of the year were more or less wet ones. Mashondé, in the upper portion of Uganda, is the first place where, in this second expedition, I obtained a view of the Victoria Lake, called in these more northern countries Luero-White (lo-of) Luta (dead) Nzigé (locust), in consequence of the reputed fact that flights of locusts, in endeavouring to cross these waters, have dropped down

from fatigue, unable to accomplish such an extended journey on wing, and, perishing in the lake, have been found dead in dense masses by the boatmen. But, like the word Nyanza, it is also applied to the Nile and its tributaries, thus confounding all inquiry. This is the explorer's greatest difficulty in endeavouring to put together the information which he hears, though it may be overcome by close questioning, even better with the natives than with the Arabs; for whilst the former regard all rivers flowing, as we do, from head to mouth, the Arab invariably says it runs from mouth to head. In a southerly direction the Uganda boatmen go as far as the island of Ukerewé, which I saw on my first journey to Muanzae, the southern extremity of the lake; and to the eastward beyond the escape of the Nile, to the north-eastern corner of Victoria Lake, where by a strait they gain access to another lake in quest of salt, possibly the Baringa of Dr. Krapf, which he, from information gained through the natives, called Salt Lake, most likely because there are salt-islands on it, which reasoning I deduce from the fact that on my former expedition, when the Arabs first spoke to me of the Little Luta Nzigé, they described it as a salt-lake belonging to the Great Nyanza; yet not belonging to it, when further pressed upon the subject. The Great Nyanza waters were purely fresh and sweet. They (the Arabs), like Dr. Krapf, merely narrated what they heard. As salt-islands were visited by the natives in search of that mineral, the surrounding waters naturally were considered salt by them, deprived as they were of its connecting links, which included the whole area of ground under consideration within the limits of the drainage system of the Nile. The Arabs, who it is now very clear, had heard of everything in connexion with the science of physical geography, were enabled to connect what they had gleaned in detached fragments from it. Dr. Krapf further tells us of a river trending from the river Newey, by Mount Kenia, towards the Nile. If such is the case, it must be a feeder to the Baringa, whose waters pass off by the Asua River into the Nile, for the whole country immediately on the eastern side of the Victoria Nyanza is said by the Arabs, who have traversed it for ivory, to be covered with low rolling hills, intersected only by simple streaks and nullahs from this point in Muanza to the side streak, which is situated on the Equator, on the northern boundary of the Victoria Nyanza. Turning now again to Mashondé, and proceeding north along the boundary coast of Nyanza to the valley of Katonga, which, as situated on the quarter of the lake, is constantly in view, the land above the lake is beautiful, composed of low sandstone-hills, streaked down by small streams—

the effect of constant rains—grown all over by gigantic grass, except where the numerous villagers have supplanted it by cultivation; or on the deltas, where mighty trees, tall and straight as the blue gums of Australia, usurp the right of vegetation. The bed of the Nyanza has shrunk from its original dimensions, as we saw in the case of the Ujiji Lake; and the moorlands immediately surrounding are covered with a network of large rush-drains, with boggy bottoms, as many as one to every mile, even counting at one period a much fuller stream than at the present day, when the old bed was on the present surface of the water, and its breadth was double that which it now presents. The Mountains of the Moon are wearing down, and so is Africa. Crossing over the Equator altogether, the conformation of the land appeared much the same, but increased in beauty; the drainage system was found the opposite, clearly showing where in the north slope of Africa one stream, the Mweranga, of moderate dimensions, said to arise in the lake, flowed north, and joined the Nile in the kingdom of Unyroro, where its name is changed to Thafa. Far on another stream, the Luajerri, followed its example; and then still further on from the centre of the Lake Nyanza's coast, issued the parent stream of the Nile, flowing over rocks of igneous character 12 feet high, which the natives, and also some Arabs, designate by the simple name of "stones." I have done myself the honour to christen it the Ripon Falls, after his Lordship, who was the President of the Royal Geographical Society when the expedition was set on foot. Now, proceeding down the Nile from the Ripon Falls, the river first bisects the sandstone hills which extend continuously into Usoga above the coast-line of the lake, and rushes along northwards with mountain-torrent beauty; and then, having passed these hills—of no great extent—it turned through long flats more like a lake than a river, where, in Unyroro, it was increased by the contribution of the Kaffu and the Luajerri, and continued in this navigable form to the Karuma Falls in Chopi, where again, the land dropping suddenly to the westward, we saw the river rushing along with boisterous violence; but could not follow it, owing to the war which lay upon the track. It was, indeed, a pity, for by common report, not 60 miles from where we stood, the Little Luta Nzigé, which I had taken so much trouble in tracing down its course from the Lunæ Montes, with its salt islands in it, joined the Nile.

The main river was next met with in the Madi country, due north of the Karuma Falls, where it still bore the unmistakeable character of the Nile,—long flats, long rapids. The southern half of the Madi was a flat, extending, we believe, to the junction of the Little Luta

Nzigé, the northern, a rapid extending down to the navigable Nile; that is to say, the Nile which is navigable its entire length during the period of its flooding; and here it is that the Asua River, of which we have heard, draining from the north-east corner of the Victoria Lake, joins; in a rainy season an important feeder, but when low, fordable. The first great affluent, which, indeed, is the only one worthy of remark on the left of the Nile, is the Bahr el Ghazal. The point of confluence presents the appearance of a diminutive lake at a sharp elbow of the Nile, and has hardly any visible stream of its own, whilst the great river winds round with a considerable velocity, carrying, as I have said, the palms with it. The second affluent in order of position, which, with all the others, is on the right of the Nile, is the Giraffe River, swirling with a considerable stream and graceful round into the parent Nile. Its magnitude and general appearance is like that of a first-class canal, inferior to the Kitangulé River, although not so much so as to equal in volume one-third of the Nile at its point of junction. It is navigable to a great distance south; but where it comes from, nobody knows. It cannot be called a mountain river, as we found it full of rosets floating on its surface as in the Nile, evidently showing that both the trunk and the branch are subjected to the same alternations of sluggish flats and rapids. The third is the Southern Sobat River, which was full and navigable. In breadth it is greater than the Giraffe River, but less in velocity; so that we may infer their perennial contents are much the same. Unfortunately, the Northern Sobat was passed without our knowledge, which also being navigable, would make the Upper Sobat, that is to say, the Sobat above the Delta, of far greater magnitude than the Giraffe, unless, indeed, the three streams may be one river still further south, when in its combination the comparison would have to be drawn with the Nile above it, which it would very nearly equal; for the Nile, with these additions, has scarcely doubled its importance, considered as it was seen from above entering the Bahr el Ghazal. The Blue River was long assumed to be the Nile only because its perennial powers were never tested. It appears to be a mountain-stream emanating in the country without the rainy zone, but subject to the influence of tropical rains and droughts, at one time full, and empty at another, or so shallow as to be fordable. The suspicion, therefore, that it was the Nile must of itself appear absurd; for its waters, during the dry seasons, would be absorbed long before they reached the sea. But apart from this feature of the volume of the Blue River, the Nile runs like a sluice in its wonted course; whilst the Blue River, conjoining with the

Giraffe and Sobat, describes a graceful sweep. The Atbara, which is the last, is in all respects like the Blue Nile, only smaller. With one more remark I will conclude. In the height of the dry season in the White River, the Blue is freely navigated, owing to the great accessions of the Giraffe and Sobat Rivers, but below the Blue and Atbara Rivers to the sea, the sandbanks obstruct further passage. There is one thing that I have left unstated, and that is the fact that, on my return, the first Englishman I met was Mr. Baker, with whose name you are already acquainted, who came up for the purpose of helping us out of a scrape, if we had got into one. Mr. Baker hearing that there was one branch of the river that I had not explored, went on for the purpose of searching for it; and I trust that before another year is out we shall see him back to tell us all about it. Another remarkable fact was that three ladies came up to meet me; but one having been taken ill, Mdlle. Tinné and her mother went up the river to satisfy their desire for geographical knowledge. I endeavoured to persuade them to return, and subsequently wrote them a letter, entreating them to give up their journey, with what result remains to be seen. If the remaining branch is not explored by these parties, why, I shall have to do the work myself.

Captain GRANT, who was also received with loud applause, said Captain Speke had been his companion throughout the journey. They had been brother officers in India; and when he knew that Captain Speke was about to go to Egypt, he expressed a wish to go with him. Captain Speke assented, and they went; and he was most happy to say that not a single word of dispute had ever occurred between them, but that the greatest cordiality and good-fellowship to each other had always existed. In fact, he felt great pleasure in being associated with such a brave leader as Captain Speke. He had with him a few sketches as well as some botanical specimens which he had brought from Africa; and he should be very much pleased to show them to any one who might wish to inspect them. Should any gentleman desire any information, he should be happy to reply to any inquiries that might be made.

Captain SPEKE then, at the President's request, favoured the audience with some interesting information on the habits and manners of the natives of the countries through which he had travelled. It was deeply to be regretted that these natives were not brought under the light of the Gospel. He considered that if black men were appointed consuls on the coasts, very beneficial results would accrue in the production of confidence among the natives. They possessed pleasing manners, but unfortunately the want of religious truth led them to commit many errors. One of

the results was, that when a party of them had made an agreement to serve him they did not keep it, but ran away. He had engaged 185 of them, but only eighteen had adhered to him throughout the whole of the journey. He then described the great efforts he had been compelled to make in order that his caravans might be fed. He had only two guns, and with them he shot rhinoceroses, buffaloes, birds, &c. Afterwards his men became blind and stricken with fever, and it was months before they could proceed on their journey, and then only in detachments. In proceeding through one of the kingdoms he found the Sultan most anxious to detain him, in order that he might fleece him. The King of Uganda was their greatest friend. He and his people were not pure negroes. It appeared to him that there had been an immigration of the Abyssinian race, and the result was that the people had not the nose of the negro, but noses like Europeans. They were tall gaunt men, but they had the curly hair of the negro. They had lost their language, and they had also lost religion, for they had no idea of a soul. The King of Karagwé possessed a very inquiring mind. He asked about the stars and moon, and also what became of the old suns. He (Captain Speke) first taught the King to shoot. When he first handled a gun he placed it on his thigh and shot the cows in the courtyard. The King had given him a great deal of geographical information, and he was very much opposed to his leaving. Captain Speke then related several interesting anecdotes, and concluded amid the loud cheers of the Meeting.

The PRESIDENT then presented to Captain Speke the Gold Medal which the King of Italy had sent to him, and intimated that a similar medal was on its way for Captain Grant.* He therefore, in the name of the Society, offered their grateful thanks to the King of Italy for His Majesty's good will, and amid great applause called upon the distinguished Italian geographer, Signor Negri Cristoforo, who was present, to explain to the Meeting how deeply his Sovereign and his countrymen appreciated the arduous enterprise so successfully executed by Captains Speke and Grant.

Signor NEGRI CRISTOFORO returned thanks in an eloquent speech in his native language, which was much applauded.

The PRESIDENT having expressed a hope that some honours of the British Crown would be conferred on the discoverers of the Nile, concluded by moving that a cordial vote of thanks should be given to Captains Speke and Grant, which was carried amid the greatest enthusiasm, and the Meeting terminated.

* The medal for Captain Grant has since arrived, and bears the following inscription:—"Al Capitano Grant: devise col Capitano Speke gloria e pericoli."

The Climate of Lake Nyanza. Deduced from the observations of Capts. SPEKE and GRANT, by FRANCIS GALTON, F.R.S., Foreign Secretary Meteorological Society.

Nature of the Observations.—The temperatures in the accompanying table are deduced from daily observations made by Captain Grant at his principal stations. The minima temperatures were invariably recorded; the maxima were intermitted during $3\frac{1}{4}$ months at Karagwé, when the only thermometer suitable for their registration had been taken by Captain Speke to do service at Uganda. Fortunately a complete series of 9 A.M., 3 P.M., and 9 P.M. observations were made by Captain Grant at Karagwé, before and during this interval, and afford materials for a satisfactory reproduction of the absent data. Observations at 9 A.M. were continued during the whole journey, but the 3 P.M., and still more frequently the 9 P.M., were latterly almost wholly omitted. The thermometers were excellent instruments, made by Casella: they have been examined and freshly guaranteed by their maker since the close of the journey.

The number of days of rain and slight showers is taken from Captain Speke's journal, in which they were invariably recorded. The rainfall was measured by Grant. The rain-gauge was likewise made by Casella, and was used up to Unyoro, where an accident compelled the substitution of a tin can with a measured aperture.

The prevalent direction of the wind was estimated by Captain Speke, without the aid of any special instrument.

Temperature.—The thermometrical registers are very antagonistic to the popular ideas of African and Equatorial temperatures. We find that in only one instance during the 5 months spent at Karagwé, did the maximum temperature attain 85° . We also find the nights to be invariably cool. At 9 P.M. the temperature ranged between 60° and 71° , and the coldest period of the night between 57° and 65° . There seems nothing in such a climate that should be trying to a European constitution. The heats are not too great for ordinary labour in the morning and evening, while the nights are never too hot for refreshing sleep. There is more severity in a hot English summer than in the climate of Karagwé—far more severity in the summer of the south of France. The great elevation of the basin of the Nyanza above the level of the sea will partly, if not wholly, account for the moderation of its temperature.

Uganda, although 1700 feet lower, seems little hotter than Karagwé. Speke's maximum thermometer, which was examined and registered once a fortnight, ranges closely with the simultaneous observations made by Grant at Karagwé, if we omit a single uncorroborated entry of 92° , which may reasonably be ascribed to exceptional circumstances, or to error. So, again, Grant's Uganda observations form a consecutive series with those he had previously made at Karagwé, which they would not have done if the difference of temperature at the two places accorded with the usual approximate rate, viz., 1° of cold for every 300 feet of elevation.

Unyoro is decidedly hotter. The temperatures registered on

the march between Uganda and Unyoro are the highest of the whole year. They are not, however, considered by Captain Grant to have been observed under circumstances favourable to accuracy. The maximum once reached 91° , and twice reached 89° . The Unyoro maximum was 86° ; its minimum ranged between 61° and 72° .

Rain.—The annual rainfall is 49 inches,—an unusually small amount for an equatorial region, and inferior to that of many places in the British Isles. This deficiency is reasonably to be accounted for upon physico-geographical data. The outflow of water from every district must be ultimately supplied by clouds charged with vapour originally generated by evaporation of the water of the ocean. Now, the district of Lake Nyanza is peculiarly ill-situated for receiving rain-bearing winds from the African coasts. The vast desert of the Sahara cuts off all moisture from the north; and the easterly winds which were chiefly met with by Speke and Grant, must have deposited the larger portion of their load of water when they first impinged on the rampart-like eastern edge of the East African plateau.

The wind is variable during the rainiest season, at other times easterly winds prevail.

The sky was remarkable as being either very clear, with fleeting clouds, or heavily overcast, with low black clouds.

The wet and dry seasons are imperfectly marked in the Nyanza districts. Their most distinct manifestation was in the April and November rains, and in the comparatively dry weather that immediately preceded the former. It must be remarked that Speke's 21 days of "rain and slight showers," during March, in Uganda, corresponds to only 11 days during which enough rain fell at Karagwé to enable Grant to measure it. The frequency of these showers is, therefore, an imperfect criterion of the wetness of the month.

Taking the average of the whole year, there is rain of some description, whether heavy or slight, on two days out of every three. A sufficient rainfall takes place to be worthy of measurement by the gauge, on one day out of every two. About once a month a heavy burst of rain occurred, to the amount of one or two inches; and fully one-third of the annual rainfall was contributed by these occasional storms. The river-beds were often suddenly filled in consequence of partial deluges; and masses of tangled grass, with soil attached to them, were washed down to the Nile during the rainiest months; but there is no appearance of the level of the Lake Nyanza being affected by the different seasons in any considerable degree. Thus, in the sketch of the outflow of the Nile, trees of some years' growth are seen to clothe the promontories down to the water's edge. On the other hand, it is well known that the rainy and dry periods are sharply defined at Gondokoro, and even so far to the north of that place as Miani had explored, viz. to north latitude $3^{\circ} 34'$. We must, therefore, ascribe the rise and fall of the trunk stream of the Lower Nile to the periodicity of the rains that feed it south of the 3rd degree of north latitude, and, in a *very inconsiderable degree*, to the periodicity of the rains that fall upon the land whose drainage is into the Lake Nyanza.

CLIMATE OF THE COUNTRIES BORDERING LAKE NYANZA, 1861-2.

Explanation.	a = from the 1st to the 7th b = " " 8th " 15th c = " " 16th " 23rd d = " " 24th " end.	TEMPERATURE.				RAIN AND CLOUD.				WINDS.
		Mean Temperature.	Extreme Heat.	Extreme Cold.	Extreme Range.	Rainfall in inches.	No. of Rainy Days.	Rainy Days, per Month.	Days of Rain and slight Showers. (Spoke.)	
Karagwé, 5100 feet above sea-level.	Nov. d	70	80	57	29	1.00*	2*	(12)	17	N.E.
	Dec. a	70	83	58	27	.77	4			N.E.
	b	66	78	53	26	.34	5	14	16	N.E.
	c	67	80	57	25	.32	3			N.E.
	d	68	84	57	29	1.35	2			N.E.
	Jan. a	69	82	57	27	.21	2			N.E.
	b	69	85	64	23	.89	2	14	14	N.E.
	c	68	80	57	25	.84	4			N.E.
	d	67	79	57	24	1.47	0			N.E.
	Feb. a	68	82	58	22	.86	4	12	12	N.E.
	b	68	85	58	26	1.90	2			N.E.
	c	67	80	59	25	.13	2	12	12	N.E.
Uganda, 3400 ft. elevation.	Mar. a	70	80	58	20	.63	0			E. by N.
	b	69	81	61	22	.34	4	11	21	Variable
	c	68	84	59	27	.62	4			E. by S.
	d	69	80	60	22	.98	2	18*	27	S.E.
	April a	68	79	61	20	.84	2			S.E.
	b	65	71	60	13	4.00*	0*	21*	26	S.E.
	c					3 heavy storms (in all 8 in.)	2*			Variable
	d						0*			
	May a						4			
	b						4			
	c						4			
	d						5*			
Camp, 3400 ft.	June a	69	79	62	19		2*			
	b	69	79	59	22	.42	2	8*	20	S.E.
	c	70	80	60	20	.68	2			S.E.
	d	69	80	62	20	.65	1			
	July a	68	78	61	17	1.94	3			
	b							(15)	22	S.E.
	c	76	81	64	29					
	d									
	Aug. a							(14)	20	S.E.
	b	74	86	60	31					
	c									
	d									
Unyoro, 3200 ft. above sea.	Sept. a									
	b	75	86	65	23			18*	18	Variable
	c	73	84	62	24	1.61*	3			
	d	73	80	61	21	.44	6			
	Oct. a	72	82	64	20	3.00	6			
	b	72	82	63	21	.82	4	21	27	Variable
	c	73	82	63	21	3.48	6			
	d	74	84	65	21	1.30	5			
	Nov. a	72	83	64	21	2.20	1			
	b									
	c									
	d									
Means and Totals		68	82	51	49	34.93	135	240		E.
Estimated value for complete year		68	82	51	49	49	178	240		E.

These are obtained by adding 30 to the temp. at 3 p.m. No maxima were taken.

Uganda maxima, taken each fortnight by Captain Speke.

These are of doubtful value. The thermometers were hung in crowded butts. No record in note-book of any unusual heat.

Rain seldom alluded to in note-book. (6 in.)

The numbers marked by an asterisk * are partly, and those included in brackets () are wholly, deduced by proportion. Rain chiefly falls in sudden showers and thunderstorms. The sky is either very clear, with fleeting clouds, or overcast, with low black clouds.

[The following amusing letter from Captain Speke to Rumanika, King of Karagwé, may appropriately be inserted here, as giving a sketch of native manners and customs at the Court of one of these petty sovereigns, and of the curious experiences of the writer during his adventurous journey alone,—Captain Grant having been detained at Karagwé by an accident.]

Copy of a Letter from Captain J. H. Speke to H. M. Rumanika, King of Karagwé, dated "Bandowaroga M'tessás Kibuga," which I have been directed to copy and transmit to the Royal Geographical Society, received by me on the 23rd March, 1862, and its probable date the 3rd of March.

Karagwé, 27th March, 1862.

J. A. GRANT, Captain.

"Bandowaroga M'tessás Kibuga.

"MY DEAR RUMANIKA,—By the blessings of God, and with thanks to thee, Great King, for the many favours you have shown me, I have at length reached this place in good health, and have had an interview with the mighty King M'tessa. First, I must tell you that I no sooner arrived at Niama Goma, one stage short of this, than I sent Nyamgündü, my m'koongo, instead of Maulah, forward to announce my arrival, and to say I had come through many dangers and difficulties to see him, for I considered him the King of the Luta-Nzigé, and that Uganda was his pasture-ground. Nyamgündü found M'tessa had gone on a pilgrimage to another palace on the border of the lake, so followed him there and delivered the message. M'tessa had no place appropriate to my reception there, so hoped I'd stop one day longer where I was whilst he came here to receive me. He then gave Nyamgündü three cows, and sent me seven, four of which were milch ones. On the 18th he reached this place, and sent a man to fetch me; but the day was far spent, and my men were all fever stricken, so that I could only make Sünnaás Kibüga that night. However, next morning (19th) I came here. It rained, so M'tessa said he hoped I would call next day.

"20th, morning.—Started for the opening visit. As a guard of honour I had twelve men, all dressed in joho down to their heels, and carrying carbines with bayonets fixed; preceding these was the 'Union Jack,' and in their rear I had all the other men, each carrying a present: one had the tin-box with four rich cloths in it, value 200 brass wire; one gun = 200 wire; one gold chronometer = 400 wire; one revolver = 300 wire;—then three muskets with bayonets, one box ammunition, one box bullets, one box caps, one telescope, my big chair, one pair of spurs, one set of spoons and forks, elastic bands, and finally ten bundles of every sort of best beads, all covered with chintz and tied with red tape. It all looked very pretty; and as we marched past, the people along the road said, 'Oh, how very beautiful!' I thought myself all was going on as well as could be; but presently Kiyengo's man with Suwarora's present of wire—which was all my own—joined in the procession, and took precedence of me. However, I subdued my emotion

till I was in the palace court; when I was desired to sit on the bare ground with Kiyengo, junr., and all my servants. I could stand this no longer, so appealed to the servants in waiting; and as they only replied, 'Have patience,' I spun on my heels and walked back home, telling Bombay to deliver the presents. The king, who had shown me such respect, I hear was very distressed, so much so that he tried to follow me; but, as I had gone far and walked fast, changed his mind and sent all his Wakūngū running after me.

On arriving at my abode I tried to tranquillize my pulse by a pipe and a cup of coffee; but all the Wakūngū, Bombay, and Nasib, who had never ceased running, threw themselves before me, and implored me to return at once. M'tessa, they said, had heard I was affronted at Kiyengo's taking precedence of me, and also that I would not sit upon the ground, so he turned Kiyengo away, and desired me to bring my chair that I might sit at ease—he was dying to see me, but could not touch food until he had done so, and begged I would return. This message, I may say, touched my heart more than anything else, he had been so kind; so, to do the best, I sent the Wakūngū back again to tell him all the circumstances. How shocked I felt, but I could not help it. I was my Queen's right hand. My heart and life were at her service. If I had sat on the ground with Kiyengo and my servants, disgrace would have befallen her. I came into the country to make friends with kings, and brought presents for them all,—100 wires for himself, 50 for Rumanika, and also some for Suwarora; but Suwarora, though I entered his country at his own invitation, never once deigned to see me, but on the contrary told his Wakūngū to take property from me, and did the same himself, refusing to let me pass unless I consented. He preferred wires to anything else, because he wanted them for M'tessa, and therefore took 150. I should have pardoned Suwarora, and called his plunder Nongo, and said nothing about it, had I entered his country to trade and without being invited; but now I would never see him, nor would I ever enter his country except by force. After this message had been taken, I followed it up myself, proceeding as before until I reached the court I had returned from. Thereupon messengers, dressed with abrus-turbans and painted cow-skins, went to announce my arrival. Cows, dogs, goats, and men were led about by strings. A band of music then marched past, and finally I was asked to approach. The palace houses are large circular hay-stacks, all built in lines across the brow of a hill, and partitioned off with red screens. It was in one of the palaces in the third line where he was sitting, dressed in an mbūgi, with a bit of the same stuff for a handkerchief, that I first saw him. He had a brass ring on every finger, a ridge of hair from stem to stern of his head, and other head-ornaments. His throne was a small chibūtra covered with red joho, and he held a white dog tied by a string. Besides this, there were within the palace many of his elders, and outside, forming three sides of a square, and fronting himself, squatted several lines of men. On entering this yard, as soon as I saw him, I took off my hat, and

baded my guard carry arms. The first ceremony lasted but for a moment, when I was desired to step within the square of squatters; which being done, as everybody else was told to sit, I planted myself on the stool. The king then stared at me and I at him for full half an hour, when he sent to ask me if I had seen him. I thought this such a foolish question, that I only answered 'Yes.' He then rose from his throne, leading his dog, and walked off to another palace, leaving me sitting, whilst, they say, he ate his first dinner after three days' starvation. His gait was so curious, I asked whether he had been injured in any way; but the reply given, was, that he had learnt to move after the fashion of a lion, as his father did before him. About half an hour later, I was asked to see him again, and proceeded as before with my guard, to another court, where I found him standing on a joho, leaning against the portal, with two groups of women squatting on either side of him. I was now desired to sit down and put on my hat, and then he asked Maula and Nyamgundu to give him all their news. Maula said your message was to the effect that Englishmen had come up the Nile to Ugani and Ukede. After this the king proceeded to another palace, followed by his women; sat upon another throne, and asked me to draw near: which I did. Again he asked me if I had seen him,—a question evidently dictated by excessive pride; so, to flatter him, I said, 'Oh yes, indeed, you are very beautiful!—as refulgent as the sun. Your hair is like the wool of a black sheep, and your legs, when you walk, move as gracefully as a lion's: I am very pleased to see you; and as an earnest that I am so, may I beg you to accept this gold ring, which I take off my third finger and place on your own. I shall then consider it a token of our having contracted a lasting bond of friendship. M'tessa then replied, 'If your desire is friendship, then what would you say if I showed you a road by which you could reach your home in one month?' But before he would give me time to answer, though I longed to open the conversation with him, he said he would like to see the gun I shoot with. Much disappointed at the hasty interruption, I told him I had brought with me the best shooting gun in the world, which I hoped he would accept, with a few other trifles; and, if he would consent, I would lay them on a carpet at his feet, as is the custom of my country when visiting Sultans. He graciously assented, sent all his women away, and had an m'bugu spread for the purpose. The ceremony of presentation was then gone through by Bombay first spreading a joho on the m'bugu, and then opening one thing after the other, which Nassib rubbed against his dirty face and then handed to the Sultan. A long talk now ensued till night stopped the proceedings, when the Sultan asked me what I liked most to eat (the most sensible thing he had done), and then said 'Would you like to see me to-morrow?' I said, 'Yes, every day.' 'Well then,' said he, 'you can't see me to-morrow, because I have got business; but the next day come if you like. You can now go away; here are six pots of pombe for you, and my men will search for food to-morrow.' I was very tired and

very glad to go—not to dinner, for I had none, excepting beef, which I could not eat alone, but to bed and to rest my wearied limbs. You will perceive that I presented no brass wires, because, in fact, I had not 100 left to give.

"21st.—Rain fell to-day, which is considered a sign of good omen. I send Nyamgündü to enquire how the kibakka (king) is, and in the evening he sends twenty cows and ten goats; of which five cows are claimed by Wazaro as his right. At first I refuse to give them, as it is contrary to etiquette to give anything away that is given to me; but on his insisting, I tell him he shall have them this time, but for the future I shall not accept anything that I do not eat myself; for I consider the fifteen cows were given to me. Nyamgündü then begs for a goat to offer as a sacrifice to his temple; but I give him a wire instead, as I cannot give away the kibakka's present.

"I have now told you of my reception at M'tessás Kibūga, so shall now go back a little to tell what happened before. I greatly enjoyed the journey with my Wakūngū, Maula, and Nyamgündü; the former did not overtake me till I reached Mashakka, the residence of Pokérū, governor-general of Uddū, and appeared when the governor was present, giving me a nazir. I then complained of Maula's having treated me like a dog, and expressed a wish that Nyamgündü should be my guide. Pokérū politely assented to my request, and as a reward to Nyamgündü I then gave him four wire, twenty blue eggs, and ten foondo of all colours of beads.

"The next thing I should like to tell you about is an explanation of what I read in brother Grant's letter. He informs me that the Arabs had been telling you we did not eat meat, and that you were very angry with them. Now let me assure you that the French even call us 'Roast Beef,' because it is our national food. Again he informs me we have bribed the Watuta* to fight against Suwarora. This I assure you is a malignant falsehood: so much so that I stopped my expedition, to return from M'sere to Unyanyembe, on purpose to prevent the Arabs doing this very thing. They had done so; but they promised both Musa and myself that they would retract what they had done, and further, as Suwarora's M'kūngū arrived at the same time in Unyanyembe, Mūsa told him what I had done, and likewise told him that when I arrived in Usui, I would settle all the differences in person with Suwarora. Suwarora, however, coveted my wires more than my advice, and so we never met; and, please God, we never shall do so, for he has insulted me beyond measure. I tried to terminate the war in Unyanyembe, both at the request of Mauwa M'sera and the Arabs; and should have done so only that the Arabs, contrary to my advice, killed poor good old Maula of Rubuga in such a treacherous manner that Mauwa M'sera was afraid to treat with them. The reason why these Arabs, whom you see trading, dislike and tell such lies about us, is because they are

* Note by J. A. Grant:—"The Arabs, and not we, had bribed them."

very ignorant, and do not know that we sided with Sayyid (prince) Majid against his brother, who wished to fight him because old Sultan Said Said, their father and our good old friend, asked us to prevent their fighting; which he rightly foresaw would be the case as soon as he died. The Arabs say we want to take Zanzibar; but that we could do and might have done long ago with only one ship, but we love Sayyid Majid, so much that we are going to crown him Sultan as soon as the arrangements can be made. He is not a Sultan yet, but only a Sayyid, or Prince. The Arabs, whom you see are all fugitive renegades of the Harsi caste who tried to spoil Zanzibar, who tried to spoil Unyanyembe, who tried to spoil Ugogo, and now who try to spoil Usui; and they will do so, you may depend upon it, if Suwarora does not govern his country better. No Wakungu in any country has a right to tax a caravan. One country can only take one honga, and if it tries to take more it will be a just provocation of war. Mauwa M'sere has lost his throne by trying to levy mahonga where none existed before. Ugogo takes six mahonga—this caused the war there, but none take so much as Usui; so your own wisdom will tell you Usui must give up its mahonga, reducing it to one moderate honga, or fight the merchants, who will destroy the country, for the Arabs are many, and all are as hungry for ivory as lions are for meat. With fairness, justice and truth all would go well.

"Last night, when I was in bed, M'tessa sent a message to me, saying, if I wished to be his friend, he hoped I would lend him another gun, to make up six with what I had given him, as he wished to visit his relations, and show them how well God was pleased with him, sending him an M'zūngū and so many pretty things. It was a greater favour than ever he had shown his father, and pointedly proved his right to the throne of his father; I sent him three.

"22nd.—We hear M'tessa going the round of his relatives with all his muskets and a band of music. Suwarora's wires were presented yesterday, and all he said was, How did he come by these? they were made by the Wazungu to be given to me, and Suwarora has robbed them of them. The reply was Suwarora would not show the Wazungu any respect, because they are wizards, and do not sleep in houses at night, but fly upon hill-tops, and practice every description of bad sorcery. M'tessa wisely said, 'That is a lie! I can see no harm in this Wazūngū; and, if he had been a bad man, Rumanika would not have sent him to me.' M'tessa now sends a m'koongoo to ask after my health; says he is very sorry he cannot call on me to day, but hopes I will take the will for the deed. Extravagant reports have been spread about my generosity to Nyamgündū, and the Wahinda are all jealous of him begging for something. My reply is, I gave nothing to Nyamgündū until he treated me with marked respect; I then gave him a trifle; but as yet I had not been introduced to any of M'tessa's courtiers, and therefore did not know them. My kirangōzi claims the head and mtūsi the teats of every cow killed. At midnight the Kibakka returns the muskets lent,

and I am so pleased with his promptitude and honesty that I beg him to accept them.

"23rd.—M'tessa would like to know if I desire to see him; on replying, 'Yes,' he tells me to come at twelve, which I do with the guard of honour and my stool; but I am kept waiting in an antepalace three hours before he is ready. During this time he sends me a royal bundle of grass, and hopes I won't be affronted if I am required to sit upon it, as nobody but himself can sit upon such grass. It is all his throne is made of. Nobody ever yet sat upon a chair in Uganda, and therefore he cannot allow me to do so. He only assented to it the first day to appease my wrath. At the third hour I was called in, and the bundle of grass placed in the open court before his throne. There were few spectators present, but the dog as usual was by his side. It then began to rain, and we were desired to adjourn till the fall was over. When the rain ceased we were again called, and found four cows in the court, whilst the head of another, with one horn out off, was lying before the throne. M'tessa had taken off his ten brass rings, and had put my gold one on his third finger. He then wanted me to shoot cows quickly; and as I had no bullets, I asked him to let me fire his pistol, which I did, and shot in all four cows; but one of them, being only wounded, turned at me, so I knocked it over with the third bullet. The cows were then given to the Wungwanas; and he loaded a gun with his own hand, and ordered a servant to go out and shoot a man with it, which was done without the slightest concern. I was now asked to draw near, and for the first time sat in company with him. He then sent all his retinue away, and showed me a book which I had given to Rumanika. I then asked for leave to send a *dák* to Karagwé, to find out how my brother was, and proposed sending boats to fetch him; but he said he would send Nyamgündü, if I liked, to Karagwé, and boats to Kitengüle, but he thought Rumanika would not consent to their going to his *ukamma* (palace). I was then dismissed by torch-light.

"24th.—The King again sends for three of my men to shoot cows; but I send seven, with Bombay, to tell him I have three vessels waiting for me at Ugani, and I have instructed one Englishman to look for me at Karagwé, and another to try and come here; so, if he would send a messenger to the vessels, that Englishman would come to see him. I have lots of property there; and if he would tell me what he likes most, I would write for it; for I feel very much ashamed of having been able to give him so little. M'tessa admitted all the men, and told them to shoot cows; but Bombay said he wished to speak one word first. M'tessa said, 'What is it?' And when Bombay told him, he said, 'Very well: I will either send boats *niá* Ukidi, or will send by land, just as the gentleman likes; but it would be well if two Wungwanas went with his men.' Then, in a great hurry, he said, 'Now shoot the cows, for I want to see how Wungwanas shoot.' They killed the seven, and all were given them, when they were dismissed. Whilst

this was going on, Kiyengo, junr., calls on me and begs for meat. I tell him M'tessa is his host, he should ask him; but he said, 'I have never had one sight of him, because he only wants to see the Wazungü. When I gave the wires, he sat behind the screen.' I then told Kiyengo, in my best Kiswahili, what I had heard at court concerning him, accusing Suwarora of having tried to belie me. He acknowledged all, and said he was obliged to deliver the message; but I must not consider him the author of it. I then forgave him, and put him upon a Kirangōzee's rations; not, however, without telling him of Suwarora's treatment of me. In the evening M'tessa wishes to know whether I'd like to shoot kites in his palace, but I say 'No; if he would show me either elephant, buffalo, or rhinoceros, then I'd be very happy to shoot with him.'

25th.—Sultan sends for me to shoot. I complain of my treatment at his palace, and say I am indisposed, so cannot go; but wish to send Bombay to make arrangements for to-morrow. The messenger then departs; but another comes to say the King is very sorry to hear I feel unwell, but hopes I will see him, if only for a minute, for he wants medicine. This was evidently an excuse trumped up for the occasion, but I packed the medicines and went. The old thing occurred again. I was shown to an antechamber and told to sit with swarthy negroes until the King was ready; but I would not, and forthwith prepared to leave the palace. Information flew at once to the King that I was walking off. Wakungü shut the gate against me, and others implored me to return as the King was on his throne. I stormed at the gate being shut, and made them open it again before my face, when I turned round and went in to the King. I asked him how he was, but he gave his head a silly shake, and told some men to shoot cows; but as I would not countenance his folly, he asked what the box contained I had brought with me. On being told it was the medicine he desired, he asked me to draw near, and sent his courtiers away. When all was clear, he wished to know if I would put the medicine on his stomach; but I said 'No, it must be put upon the part which seems most weak.' He then laughed, and became inquisitive; so I move my finger and ask him whether he knew what gave impulsive action to it, and, as he did not know, I gave him an anatomical lecture, and so satisfied him that I knew everything. When quite content to be operated upon, I gave him a new Rodgers' penknife, and ordered him to shave, which he did while sitting on the throne. I then applied a blister; and this being done, I said I should like to have one word with him before I left. It was relative to a plan I had formed to fetch Petherick and Grant. He approved, and said he should send for me in the morning.

"26th.—Call on the King first thing; find the blister had risen nicely. He asks me to eat some fruit with him, like loquats, which I do, and then plan to fetch Petherick and Grant; but as he won't listen to a dāk, some Wakungü are to be sent in boats to Kiten-gule. I then go home and prepare letters.

"Now, my dear Rumanika, I must wind up. Petherick's letter will go down the right bank of the Kivira River, and this one will go to Katonga, where all the royal vessels are at anchor, and then on to Kitangule, when they will cross your hills to the Palace. I wish my brother to come as quickly as he can, but my property to remain with you, as everything is uncertain in the distant future.

"I remain, ndũgo yako,

"J. H. SPEKE."

(True copy) J. W. GRANT, Captain.

Karagwé, 28th March, 1862.

The following was the text of the letter despatched by the same opportunity to Consul Petherick:—

"MY DEAR PETHERICK,—I wrote a letter from Karagwé to send it by my Balyüz Baraka, through Unyoro, to ask you how you were. Now, I am a great deal nearer you, and send another Balyüz Mabruk, together with some men from M'tessa. This is to invite you up to Uganda, for the King is very anxious to see you. I daresay this may somewhat interfere with your trade, and so create some pecuniary loss; but depend upon it, whatever that loss may amount to, I will ask the Government to defray it; for it is of the utmost importance that the country should be open to trade, &c., and no opportunity could be better than the present. You will have to drop your dignity for the present, and to look upon me as your superior officer; for on asking M'tessa what presents I should write for, he said, 'Don't say anything about it, lest he should think that I, M'tessa, coveted his property more than himself.' So, to quiet him, I said he did not understand the matter—that I ordered you to come up the Nile to look for me, and to bring me away, and that three vessels were mine, as well as their contents, and you could not disobey my orders. I do not know what things you have; but bring a lot of pretty things, such as cheap jewelry, toys, pretty cloths, glass and china ware; one or two dogs of any sort, for the King's emblem is a dog; and any quantity of powder and lead, for he shoots cows every day. Mabruk can best select these things. Don't bring uniform, for I have none, but bring a lot of common red cloth, and fez-caps for my men to wear as a guard of honour. I have lots of muskets, and have given several guns and rifles to M'tessa; so bring no spare guns here, though your men may be armed up to the teeth. I have lots of beads for the way back to the boats. Grant is at Karagwé with a game leg, and I am sending boats for him. His last letter to me is enclosed, also a map of the country, which you had better send to England, together with this, by the first opportunity. I will go across the Masai country at once to Zanzibar; but, considering your promise to keep two or three boats two or three years for me, I sacrifice everything to fulfil the engagement. A photographic machine would be very useful here, for the court is very splendid.

You need not trouble yourself with a sextant, for I have three, but compass your route carefully. If Baraka reaches you, bring him up this way; we will then all go in boats to Rumanika's, King of Karagwé. Mind Rumanika and Kamarasi, King of Unyoro, are mutual brothers-in-law, but M'tessa is Kamarasi's enemy. However, I am trying to patch up their war by telling M'tessa he is the King of the Lûta-Nzigi, and Uganda is his grazing-grounds; that he should send a present to Kamarasi, and become friends with him. You may tell Kamarasi this; and say I am a very great man anxious to see him, if he will let you come here and fetch me away. I am very hard up for tobacco, and have neither brandy nor tea. All the things I have asked for are for myself; nobody else need give a present. I cannot write any more letters, for I have a whole year's collection in Unyanyembe waiting for an opportunity to reach Zanzibar.

"J. H. SPEKE."

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