

A D D R E S S

TO THE

ROYAL GEOGRAPHICAL SOCIETY.

Delivered at the Anniversary Meeting on the 22nd May, 1865,

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

PRESIDENT.

GENTLEMEN,

In addressing a Society with whose progress I have been bound up since its foundation, I am naturally much gratified by being able to state that, having now through your kindness occupied the chair at eleven Anniversary Meetings, on no one of those occasions has it fallen to my lot to announce the existence of so large a number of Fellows as at present.

I have also the sincerest pleasure in congratulating you on the very successful labours of our new officers; for I trust you are all as highly satisfied as the Council and myself with the zealous and most effective services of our Secretaries, Mr. Clements Markham and Mr. Laurence Oliphant, and of our Assistant-Secretary, Mr. H. W. Bates.

I have, further, great satisfaction in calling your attention to the almost unprecedented fact in the annals of our Society, that the volume of the Journal for the past year, thanks to the untiring efforts of the Editor, is already on your table. A catalogue of our library is also completed, while the classified catalogue is making rapid progress.

In this Address I commence, as of old, with short sketches of the lives of our deceased Fellows. In the next place, after the Report of the Hydrographer on Admiralty Surveys, my chief object will be to lay before you the condition of geographical science and discovery when our Society was established, and to show

how greatly our countrymen, and our Associates in particular, have augmented the range of geographical knowledge in the thirty-five years which have elapsed since our labours began. On the present occasion, however, I cannot attempt to condense into one Address a review of such progress in all parts of the globe; but will mainly dwell on the knowledge of certain regions obtained in our time, concluding with glimpses into the vast untrodden fields which no scientific traveller has yet explored.

OBITUARY.

Eight months have elapsed since the melancholy catastrophe occurred, in which the celebrated explorer of Inner Africa, John Hanning SPEKE, lost his life. On the very day of his death he had attended the Geographical Section of the British Association at Bath, over which I presided, and the grief and horror of my associates and myself can well be imagined when the overwhelming news was communicated to us.

Having encouraged Captain Speke to return to Africa to work out the results of his great discovery of the vast body of water which he named "Victoria Nyanza," I rejoiced to witness the enthusiasm with which he was received by admiring crowds on his return to us after following certain waters of the Nile from that great reservoir of Equatorial Africa to the mouth of the mighty stream. It was also, alas! my sad duty, in company with his faithful companion Grant and Dr. Livingstone, to follow poor Speke's remains to the burying-place of his family, at the romantic and sequestered village of Dowlish, in Somerset. Yet, let me assure you that in those rural obsequies there was that which touched my heart as much as if my gallant friend had won a place in Westminster Abbey; for crowds of the surrounding gentry and inhabitants were there to mourn his loss and sympathize with his bereaved parents; whilst his affectionate friend and companion, Grant, placed an *immortelle* upon his coffin.

Descended from a very ancient family which from Saxon times has had possessions in the West of England, and some of whose representatives were Knights Bannerets under our early Kings, John Hanning Speke, the second son of William and Georgina Elizabeth Speke, was born on the 4th May, 1827, at Orleigh Court, near Bideford. He was educated at Barnstaple Grammar School, went to India as a cadet at the age of 17, and in 1844 obtained a commission in the 46th Regiment of Bengal Native

Infantry. In the war of the Punjaub he took part in the actions of Ranuggur, Sadootapore, Chillianwallah, and Guzerat. After that arduous campaign he began to turn his thoughts to the exploration of Central Africa. In the mean time, however, he employed the intervals of leave of absence from his regiment in qualifying himself for geographical research by exploring the Himalayas and Thibet; where, besides the pursuits of natural history and obtaining many spoils of the chase by the use of his unerring rifle, he taught himself how to make astronomical observations and how to construct field sketch-maps. In illustration of his pursuits and occupation during this period of his Indian service, his devoted companion, Grant, has furnished me with the following graphic sketch which evidently comes from the heart of that gallant soldier:—"No man in India was ever more esteemed for his private worth than poor Speke—and with just reason, for no one was more courageous, no one more honourable. His brother officers and friends were his staunch admirers, and the natives over whom he was placed in command attached themselves to him, and clung round him from their instinctive knowledge of his quiet and conciliating manners.

"His chief passion was to make a collection of the fauna of India, and in this, through his perseverance, the museums of India and England, particularly that which was formed by his father at Jordans, near Ilminster, bear noble testimony of his exertions for the advancement of science. Blessed with enduring powers, whether following the wild boar on his fleet 'Queen Mab' over the plains of India, or on foot, crossing the glaciers of the Himalayas, after the 'Yak of Thibet,' he it was who excelled and was the first sportsman of each season in those manly exercises. During his Himalayan wanderings he did not go there as a mere slayer, but preserved with care those birds and animals which fell to his gun or rifle. He also registered the topographical features of the country by delineating on charts the distances traversed, the courses of the streams, and the form of the mountains, as a guide to future explorers and sportsmen. Thus, in early life he showed a decided taste for true observation and cartography. One, at least, of his early maps is in my possession, and he gave others to those who were most likely to use them well. As he took his observations in India merely with a watch and compass, the sketch-routes were of course rough; but as most of the countries had not been traversed before, his maps were acknowledged, by those who afterwards tested them, to contain most valuable information."

Having completed a collection of a large portion of the fauna both of the plains and hills of Upper India and Thibet (one of the finest collections ever made by any individual) he turned his thoughts to a less frequented tract—namely, Eastern Africa. His first enterprise in this direction was in 1854, when he joined the expedition organized by Captain Burton, associated with Lieutenants Herne and Stroyan, to penetrate the almost unknown and perilous country of the Somali. Whilst his principal journeyed to Harar the capital, Speke was detached to Guray Bunder, with directions to explore the Wadi Nogal, and to visit the Dulbahantas, the most warlike of the Somali. On their return to Berbera, the party were attacked in camp, in the dead of the night, by a band of 150 men; Lieut. Stroyan was killed, and Speke escaped almost by a miracle with eleven spear-wounds in his body. One of the weapons passed through the fleshy part of his leg, and kept him for some time pinned to the ground.

Notwithstanding this, we find him, not long afterwards, and whilst his wounds were still green, at Constantinople, on his way to join the Turkish contingent in the Crimean war. The only passion, in fact, which was more strongly developed in him than the love of exploration was that of fighting for his country. Disappointed of this by the conclusion of peace, before the services of the Contingent were employed, he conceived the idea of exploring Circassia and Central Asia, but finally gave up this to join Captain Burton in a new expedition into the heart of Africa.

From the commencement of this great exploration, in which such a large portion of Inner Africa was first made known to us, including the lakes Tanganyika and Victoria Nyanza, down to the day when we heard of his advance from the Equatorial kingdoms and his own vast water-basin to the mouth of the Nile, the career of Speke is so impressed on the minds of all who hear me that I need here only to mention those feats to ensure your hearty approbation of them. For, whilst we rightly gave him our Gold Medal for the discovery of the Victoria Nyanza, on his first journey with Burton, we were still more hearty in our applause when he issued triumphantly, on his second journey, with his devoted companion, Grant, by the mouth of the Nile. I will not here enter upon the vexed question of the source of the Nile, as that will be touched upon in the course of the Address when I speak of the desiderata respecting Inner Africa which remain to be worked out.

It is to commemorate the above-mentioned noble deeds of Speke

that I called upon his admirers to unite in rearing a monument to his memory, and I am happy to say that a small sum only is now required to complete our object. I therefore trust that, just as his countrymen of the West of England presented to him pieces of plate to be heirlooms in his family, so Geographers will ere long cause to be erected in this metropolis a monument which shall be an enduring testimonial of our high estimate of a daring enterprise of which every Englishman may be proud.

The DUKE OF NORTHUMBERLAND.—Well might the muffled bells throughout the county of Northumberland, on Sunday, the 12th of February, excite the deepest sorrow for their tolling announced the sad tidings that, Algernon, the good Duke of Northumberland had breathed his last that morning. Residing in his princely Castle of Alnwick, that fine old feudal seat of the Percys, which with correct taste and at great expense he had just restored to its ancient style and enlarged, he succumbed to the severity of an attack of gout, from which malady he had suffered for some years.

Born in 1792, Lord Algernon Percy was early intended for the Royal Navy, which service—after a noviciate at Eton—he entered in 1805. He served successively in the *Tribune* frigate, the *Fame*, 74, and the *Hydra*, 38, from which last ship Captain Mundy appointed him to the command of a gunboat, to co-operate with the patriots on the south coast of Spain. His Lordship afterwards joined the *Christian VII.*, bearing the flag of Sir Edward Pellew (afterwards Lord Exmouth), off the Scheldt. Returning to the Mediterranean with that celebrated commander, he served as Acting-Captain of the *Caledonia*, of 110 guns, in a partial action with the French fleet off Toulon in 1813; and he was present at the fall of Genoa in the following year. He subsequently commanded the *Cossack*, 22, on the coast of North America, when his promotion to post-rank, and a general peace, induced him to go upon half-pay: nor had he since served afloat, though he ever evinced a warm predilection for the profession, and by seniority became a Rear-Admiral on the Reserved List in 1850, Vice-Admiral in 1857, and Admiral in 1862.

On resuming shore-life his Lordship was created Baron Prudhoe in 1816, and his enquiring mind next led him to enter with ardour into the scientific pursuits of the day. In 1818 he was elected a Fellow of the Royal Society, and the attractions of Geography and Archæology prevailing with him, he joined Sir Gardiner Wilkinson in making extensive researches over Egypt and Syria,

where his investigations—especially in Biblical chronology—are stamped with ability and judgment ; while the British Museum, to which he made rich contributions, and his own museum at Alnwick Castle, testify to his taste and diligence as a collector of sculptures, coins, and other antiquities.

Meantime Lord Prudhoe was enrolled in the Society of Antiquaries and other learned bodies, and was a member of this Society from its commencement. Afterwards he became President of the Royal Institution of Great Britain, and of the Royal United Service Institution ; and, lastly, he was elected a Trustee of the British Museum. His kindly disposition also induced him to take a leading part in numerous benevolent foundations ; and he was ever ready to contribute with discriminating philanthropy—both in person and in purse—towards the physical and moral improvement of his poorer countrymen.

In 1842, Lord Prudhoe married Lady Eleanor Grosvenor, eldest daughter of the Marquis of Westminster ; and in 1847 he succeeded his brother, the third Duke, in the Percy honours and estates. On that occasion his first order was truly characteristic of the man—“ Continue,” said he “ all the pensions and other charities granted by my late brother.” He then commenced those improvements of his estates which have rendered those extensive domains so remarkable for the well being of his numerous tenants. With a graceful devotion to the duties of his position as well as the enjoyment of its rights, he not only provided comfortable dwellings for those who were connected with him, but also established schools and erected several new churches—three of the latter having been consecrated in August last. Besides the endless charities to which he subscribed, he supported, from professional feelings, the Seaman's Hospital Society, and built a capacious “ Sailors' Home ” at North Shields. But among his philanthropic deeds, on which he expended altogether half a million of money, none were more eminently beneficial than the establishment of life-boats, at selected stations along the stormy shores of the east coast of England : thus numerous sufferers were rescued from death, and a generous intrepidity instilled into the seamen employed.

A Conservative on principle, the Duke joined Lord Derby's ministry in March 1852, as First Lord of the Admiralty ; becoming also a Privy Councillor, and a Knight of the Garter. He remained in the Cabinet until the dissolution of the administration in the following December. While at the head of that important department, he

supported measures for the aid and recovery of Franklin and the missing Arctic voyagers; and he offered to facilitate Mr. Lassell's astronomical expedition to the Mediterranean. On learning from Admiral Smyth that the officers of the institution in Jermyn-street, now under my direction, were endeavouring to purchase ancient medals for the purpose of chemical analysis, the Duke directed an accumulation of 1575 abraded coins to be sent thither, saying—"I am desirous to assist the Museum of Practical Geology, and its excellent Director, Sir Henry De la Beche."

Indeed, his Grace was ever a munificent patron of science and literature, as evinced by the various books and local surveys brought out under his auspices. One of his first acts was to confirm his brother's intention of defraying the expenses of Sir John Herschel's important volume on the astronomy of the Southern Hemisphere. He also most liberally supported Mr. Lane in the publication of his illustrated 'Arabian Nights,' and in preparing the volumes of the great Arabic Lexicon of that eminent scholar. He caused a survey to be carried on by Mr. Maclauchlan, to trace the Roman Wall through its wide span, and the windings of the Watling Street across the county—the results of which are contained in a folio of large plates most carefully engraven: a pre-historic map of Northumberland was also in hand at the time of his demise. Another proof of the Duke's capacity for selecting qualified authors and artists is displayed in a book giving the architectural and pictorial details of Alnwick, Prudhoe, and Warkworth Castles; and he, moreover, encouraged the production of various essays on local subjects which were published by the Archæological Institute of Newcastle. He also printed a description of Roman family *denarii* in his possession, for distribution among his numismatic acquaintances; and even the effusions of a Northumbrian shepherd poet were collected and illustrated at the Duke's desire.

Nor ought this sketch of the life of our excellent member to close without mentioning that, in addition to his other sterling qualities, the Duke, ever attentive to the care and keeping of his gardens and pleasure-grounds, was most successful in the culture of rare exotics. Thus the gorgeous *Victoria Regia*, discovered by our deceased Fellow, Sir Robert Schomburgk, fell under his care; and it was in the spacious tank provided for its reception at Sion House, with water in motion, that this superb tropical lily first flowered in England. He also brought that most delicate tree, the *Garcinia Mangostina*, the most exquisite of Oriental fruits, to perfec-

tion; and its first and only mature fruit ever produced in Europe was presented by the late Duke to Her Majesty the Queen.

To this truthful and characteristic sketch of the highly honourable career of the Duke of Northumberland, from the pen of his old brother officer, my predecessor, Admiral Smyth, and which I gladly endorse in every particular, let me offer the expression of my own deep sorrow for the loss of one whose friendship I had long enjoyed, and for whom my regard and respect were heightened in each succeeding year by a contemplation of his enlightened and benevolent actions. Sincerely, indeed, do I grieve for the bereavement of that noble lady who was the charm of his life, and the active and zealous participator in all the good works of Algernon Percy Duke of Northumberland.

Dr. Hugh FALCONER.—The Natural History Sciences have sustained a heavy loss in the death of my gifted friend, Dr. Hugh Falconer. Born at Forres, N.B., in 1808, and receiving his early instruction in that town, his education was completed in the Universities of Aberdeen and Edinburgh.

On his way to the East Indies, and whilst in London, the taste of the young medical man for Natural History subjects was developed by his examination of the contents of public museums. It was, however, after he reached India, and was associated with the celebrated botanist Dr. Royle at Suharunpore, near the Himalaya Mountains and the lower range of the Sewalik Hills, that he began (in 1832) those explorations in which, associated with Captain, now Sir, Proby Cautley, he collected and described those remarkable fossil remains, the discovery of which formed an epoch in geological history. It will be more especially the province of the Presidents of the Royal, Geological, Linnæan, and Zoological Societies, to dwell upon the great accessions contributed to various sciences by Dr. Falconer. On my part it is an agreeable duty to impress upon you that, amidst all his other qualifications, our deceased Associate was a sound and zealous Geographer. In one of his earliest expeditions in the mountains of Hindustan we are told that, when in want of proper instruments to measure altitudes, he melted broken tumblers and blew them into a tube, distilled mercury from cinnabar bought in the bazaar, and completed his barometer by turning a reservoir out of boxwood from the adjacent hills.*

* See an excellent sketch of the life of Dr. Falconer from the pen of Dr. C. Murchison.—'Reader' Journal, February 11, 1865.

During several years of arduous research he not only explored the wonderful fossil mammalian remains which now form one of the principal glories of the British Museum, but, when remote from all works of reference, he compared the extinct species with their living analogues in that region, and, together with his associate Cautley, brought out those remarkable memoirs and illustrations which procured for each of the authors the Wollaston Medal of the Geological Society.

Whilst Superintendent of the Botanic Garden at Suharunpore, Dr. Falconer made various explorations of the higher tracts of the Himalaya chain, and was among the first to recommend that the tea-plant should be introduced into suitable parts of these mountains. In the following years—1837 and 1838—he explored, by order of the Government, the trans-Indus portion of the Himalaya, and spent a winter and spring in Cashmeer. From thence he crossed the mountains to Iskardo in Baltistan, traced the course of the Shigar, a great tributary of the Indus, to the glacier whence it springs, on the southern flank of the lofty Mustagh range, and after next examining the great glaciers of Arundu and Braldoh, returned to resume his duties in the plain. It was during this remarkable and hazardous journey that he studied closely the phenomena of glaciers and the flow of their moraines, as well as of rivers in deep valleys formed by great antecedent geological movements, which enabled him to speak to us with so much effect within these walls on the whole subject of glacial phenomena, and to oppose with force and eloquence the new theory of the excavation of valleys and lake-basins by the grinding power of ice. Those of you who heard him on that occasion can never forget the impression which his clear language and vigorous delivery produced, and I believe you will all agree with me, that the occasion afforded a pregnant proof of the desirableness of reporting the sayings of those who can speak as he did at our meetings. This one speech, indeed, of Falconer, as happily recorded in our Proceedings, embodied such a true philosophical view of the real agency of glaciers as dependent on geographical and atmospherical conditions, that it will often be appealed to as an authority, and I naturally made great use of it in my last Anniversary Address when treating of Glaciers. Compelled to come to Europe in 1843, on account of failing health, he occupied his time at home in the publication of various memoirs descriptive of his collection, and in 1848 he returned to India as successor to Dr. Wallich, the Superintendent of the Botanic

Garden at Calcutta; and in that office, among several Reports of great value, he was urgent in recommending the trial of the introduction of the Cinchona or Peruvian-bark plant into the Nilgherries and the hilly regions of Bengal, to which districts these plants have of late years been transported from their native habitats in Peru, by our Secretary, Mr. Clements R. Markham. Retiring from the Indian Service in 1855, he visited Syria, Constantinople, and the Crimea, during the siege of Sebastopol. During the last years of his life it was quite natural that he should have taken an active part in every geological and palæontological research which might tend to throw light on the antiquity of man; for as early as 1833 he began to speculate on the possibility of human beings having been in existence when some of the gigantic extinct quadrupeds, whose remains he had discovered, were still living. The President of the Geological Society has dwelt with emphasis on his various reports on the age of those cavern deposits of Britain and elsewhere, in which implements fabricated by man have been found associated with the remains of extinct animals. In the same pursuits Falconer spent some portion of the last autumn with his friend Professor Busk in exploring the bone-caves of Gibraltar.

Although it might be thought that this subject does not come within the cognizance of the Geographer, yet I beg to assure my hearers that the geographical question of the configuration of land and waters past and present has much to do with the discussion of the great antiquity of our race, the accurate investigation of this subject being certain to throw light on the outlines of land and water which must have existed at the time when the primæval inhabitants manufactured their rude stone implements. For, these relics are frequently found in very old alluvia high above the rivers and bottoms of the present valleys; thus indicating either an enormously long lapse of time, during which the rivers have excavated down to the existing level, or, as I believe, the occurrence in times antecedent to historical records of sudden upheavals of the land, probably coincident with those great disturbances by which the British islands were separated from the Continent, and Ireland from Great Britain.

Whilst Dr. Falconer was foremost in the discussions which took place on every question pertaining to this exciting topic, and was ever zealous in exploring caves whether at home or abroad, and in distinguishing the species of extinct animals of different periods, he was equally alive to any question connected with the science of pure Geography. Thus, one of his very last letters was addressed to

myself, recommending the Council of this Society to contribute a sum for completing the determination of the real depression of the Dead Sea, all the various conflicting estimates of which were so accurately pointed out by him as to ensure our adoption of the project. In this work we had, through his counsel, the good fortune to lead the way, and the Government Grant Committee of the Royal Society followed us in furnishing the means for completing this most desirable survey.

After this brief notice of his labours in various branches of science, I regret to state that Dr. Falconer has given to the world a small portion only of that wonderful amount of knowledge which was stored in his capacious mind. Ever cautious, like the Prince of Botanists Robert Brown,* whose memory he specially cherished, in publishing any opinion until he was perfectly sure of its accuracy, Falconer has left behind him numerous diaries, notes, and papers, which in the hands of judicious commentators may, it is hoped, be made good use of in further illustration of his character. In the mean time I can truly say of him, that in my life I never met with any man who possessed keener powers of observation, and greater love of truth, or who was a more determined, straightforward, and honest supporter of it; whilst those who knew him will affirm with me, that by the death of Hugh Falconer we have been bereft of the most genial of companions and the heartiest of friends.

In recollecting that I am sixteen years his senior—for I was on service with Sir Arthur Wellesley when Falconer was born—how profoundly do I lament that he was not spared to us for a few more years to enable him to mature and complete to his own satisfaction many a work of true importance to mankind.

The Duke of NEWCASTLE.—By the decease of the Duke of Newcastle the Society has lost a kind friend, and the country a meritorious and high-minded statesman. It is not my province to endeavour to sketch the political career of this excellent man; but it is my pleasing duty to state, that as long as he held the post of Colonial Secretary he lost no opportunity of promoting geographical science. Nay more, I must recall to your recollection that when we awarded our Gold Medal to the family of the lamented Burke, his Grace attended our anniversary meeting, and on receiving the medal for the bold explorer of Northern Australia, spoke to us with

* See my sketch of the character of Robert Brown, Anniversary Address, 1859, Journal, vol. xxix. p. cxv.

a feeling for the noble fellow who perished and a knowledge of the subject, which proved how sincerely he cherished the objects of this Institution and how much he appreciated our recognition of that adventurous colonist.

Few men of this century have laboured more for the public weal than the Duke of Newcastle, and it may truly be said of him that he shortened his life by severe and incessant assiduity in scrupulously carrying out his official duties.

Accessible to every applicant, he most conscientiously strove to serve efficiently his sovereign and the country; and I have no doubt that our gracious Queen, duly appreciating his services as the Mentor and friend of the Prince of Wales in America, never rewarded any one of her subjects with more satisfaction than when she bestowed the Order of the Garter on the late Duke of Newcastle.

Professor F. G. W. STRUVE.—One of the greatest astronomers of our age, whose name graced our list of Honorary Corresponding Fellows, has been taken from us since our last anniversary, in the 72nd year of his age. M. F. G. W. Struve was one of those men who, through the vigour of their minds, never cease to carry out any important object until complete success has been obtained. Enjoying the full confidence of the Emperor Nicholas, and well supported by that munificent Sovereign, he brought the Imperial Observatory of Pulkova to the highest degree of perfection. The chronometrical expeditions which under his direction were sent forth to determine with the utmost precision the longitude of the Russian Observatories, brought M. Struve, his son Otto Struve, and their associates, to our shores, in 1843; and comparisons were carried on by the Russian astronomers, and by numerous instruments, between Pulkova, Altona, and Greenwich,—the result being that the old meridian of Pulkova was found to be in error nearly half a verst in linear dimensions.

But the operation by which Struve was most intimately connected with Geographers was the measurement of the great arc of the meridian, in which, associated with General Tenner, the eminent topographer, he eventually completed the measurement from the North Cape to the Black Sea, or over $25^{\circ} 50''$ of latitude. This, as I said in my Address of 1845 (but before the work was completed), greatly exceeds all other known triangulations, and gives to the vast mass of land possessed by Russia and Sweden the longest measurement which can ever be made on *terra firma*.

In his open and frank manners, M. Struve had much of what we

rejoice in considering the English character, and was as much liked by all our countrymen who knew him as he was esteemed and beloved in Russia, the country of his adoption.

He was present, as well as myself, at the installation of H.R.H. Prince Albert as Chancellor of the University of Cambridge, on which occasion he received the honorary degree of LL.D.

Another of our deceased Honorary Corresponding Members, and one who has long been distinguished as a Geographer, is the Russian Baron George de MEYENDORF. Belonging to a Livonian family of distinguished men—his brother, the late Pierre de Meyendorf, was an eminent and much-beloved diplomatist and statesman under the Emperor Nicholas, and another brother, Alexander, also deceased, was my companion in my first geological tour in Russia (1840)—Baron George, the deceased Geographer, rendered his name conspicuous by his travels in Asia, and particularly by his journey to Bukhara, accompanied by Eversmann and Pander, both *savans* of note. The work descriptive of this expedition of 1820 appeared in 1826 under the title of ‘Voyage d’Orenbourg à Boukhara, redigé par le Baron George de Meyendorf et revu par A. Jaubert.’

The Honourable Edward EVERETT.—By the death of our associate, Mr. Everett, who was eminently distinguished by his various literary acquirements, and was for some years Minister of the United States in this country, I have lost one of my most esteemed friends. A native of the State of Massachusetts, and born in 1794, this excellent and accomplished man was educated at Harvard College, and in early life became a pastor of a church in Boston. Subsequently, having been appointed to the Professorship of Greek in his own University, he came to Europe the better to qualify himself for his new duties, and when in England was well known to Walter Scott, Macintosh, Romilly, and other celebrities, and on his return home became editor of the ‘North-American Review.’ Subsequently, Mr. Everett took a leading position in his country as a speaker of public addresses, by which he became renowned—the last of these having been delivered on the hard-won battlefield of Gettysburg, when the army of his Northern countrymen had for the first time defeated the skilful Confederate General Lee, when he invaded the State of Pennsylvania. As a member of Congress, during 10 years, he continuously occupied himself with the transaction of foreign affairs, and composed some of the best state papers of his Government, including a series of letters to Mr. Canning on colonial trade.

Three times elected Governor of Massachusetts, he organized a

Board of Education, and to his great credit established normal schools, scientific and agricultural surveys of his native state, and a commission for the revision of criminal law. Revisiting Europe in 1840, with his wife and children, he first spent some time on the Continent, and was, through the influence of his friend, the celebrated Daniel Webster, appointed Minister at our Court. Although at that time a number of irritating questions agitated both countries, and he was left to act according to his discretion, so sagacious was his conduct, and so soothing his demeanour, that he entirely satisfied both the American and British Governments. It was during his residence here that I had frequent intercourse with Mr. Everett, and every year my esteem and friendship for him increased. In 1845 he returned home, became President of his old college at Harvard, and published a collected edition of his addresses. For a time he was in office as Secretary of State, and although he was elected a senator of his native state, his health had become so much weakened that he re-appeared little in public until he delivered the remarkable address on the field of battle at Gettysburg to which I have already alluded. Nothing can more strongly demonstrate the strong feeling of patriotism which animated Mr. Everett than that he, a peace-loving man, should have quitted his retirement to make that eloquent harangue in honour of those who had fallen in the endeavour to preserve intact the great American Republic in whose Union he gloried.

Sir Robert Hermann SCHOMBURGK.—This extensive traveller was first brought into the notice of Geographers by his exploration of the little island of Anegada, the north-easternmost member of the Virgin Islands, his account of which was published in the second volume of our 'Transactions.'* When this memoir was read before our Society, I well recollect the very favourable impression made upon my associates and myself by the energy, zeal, and ability displayed by the then unaided young Prussian traveller in delineating on a map all the rocks and reefs around this island so dangerous to navigators, and by which he doubtless saved the lives of many seamen. In subsequent years M. Schomburgk explored the rivers Essequibo, Corentyn, and Berbice, and investigated in detail the capabilities of the rich and fertile colony of British Guiana. During these researches he discovered and sent home the magnificent lily *Victoria regia*, now so well established in Europe. By his journey

* Vol. ii. p. 152.

across the interior from the Essequibo to Esmeralda on the Orinoco he was enabled to connect his observations with those of his illustrious countryman, Humboldt, who had always been his patron, and thus to determine astronomically a series of fixed points extending across the watershed of the great rivers of Equatorial America. For these remarkable services, by which the sciences of zoology and botany, as well as geography, were greatly enriched, this Society rightly conferred on M. Schomburgk, in the year 1840, one of its Gold Medals. At the same time he was appointed Consul in British Guiana. Returning to that region, he extended his travels, in 1843, from Pirarara overland to the head-waters of the Corentyn, and descended that river to Demerara, as recorded in the fifteenth volume of our 'Transactions.' He then received the order of knighthood. In 1848 Sir Robert published an excellent work on Barbadoes, graphically describing the hurricanes of the region as well as the statistical and political condition of the island. In the latter years of his life he was, to the great benefit of our interests in the East, employed as Consul-General in the kingdom of Siam, where, by his conciliatory manners and sound judgment, he has greatly advanced the interests of our commerce and sustained the best relations with a singular and heretofore little-known people.

Nor has he whilst there been less alive than in earlier years to the importance of geographical surveys; for, besides other excursions, including an important journey from Bangkok to Chiengmai, the principal city of the Lao country, he repaired to the isthmus of Kra, with a view of ascertaining by actual observation the value of the recommendation to cut a ship-canal across it, and thus save the long detour by the straits of Malacca, for the trade between Siam and British India. Feeling that his health was declining, Sir Robert Schomburgk returned to this country last autumn, and on retiring from public life obtained a well-merited pension, which unhappily he enjoyed but a few months, for he died at Berlin on the 11th March.

Dr. BAIKIE.—In the Address of last year I alluded to the prospect of the return of this deserving African explorer and Envoy of our Government, but alas! he was taken from us on his homeward voyage.

Twelve years ago Dr. Baikie, then an assistant-surgeon of the Navy under Sir John Richardson, was recommended to me by that eminent man as a person capable of taking part in an expedition which was then fitting out to ascend the Niger in

a steamer, the *Pleiad*, built for the purpose, with the view of forming a sort of trading settlement amongst the natives of the interior of Africa. On the death of Consul Beecroft, who had been appointed leader, the command of the expedition devolved upon Dr. Baikie, who carried the enterprise to a successful issue, and on his return published an instructive account of the voyage.

In his subsequent voyage, in 1857, the unfortunate loss of the iron steamer, *Day Spring*, on the rapids at Rabba, which would have disheartened most men, only served as a stimulus to Baikie and his associates to elicit the best results in their power even in this forlorn state. Gathering together the débris of the vessel and erecting huts on the neighbouring banks, they were soon in a condition to open communications with surrounding native chiefs, which eventually led to an interview with the principal sovereign of those parts, the Sultan of Sakatù. Another vessel, the *Sunbeam*, was sent out to the shipwrecked party, and a settlement was established at Lukoja, near the junction of the Chadda and the main stream. After seven years of persevering endeavours in promoting civilisation amongst the native tribes, Dr. Baikie's desire to return to England, and see once more his aged father, was granted; and H.M.S. *Investigator* was sent to bring him down the river in the month of September last. But he was not destined to see again his native land.

I am aware that the Foreign Ministers of this country, past and present, have been well satisfied with the efficient services of Dr. Baikie; but I regret to say that some time must elapse before the real value of those services can be made known. Whilst our deceased member made but scanty communications to us, he kept, as I understand, numerous journals descriptive of his journeys and researches, from which he doubtless intended to compose a complete work had he not been unhappily cut off at Sierra Leone, where he halted for a few days only. These documents, now in the Foreign Office, are undergoing a revision under the hands of the accomplished African traveller, Dr. Kirk, and it is to be expected that they will throw important light on the geography and natural history, as well as upon the statistics and customs of the natives of that part of Africa.

In successfully braving the dangers of the climate during so many years (for he was in good health when he left the Niger), Dr. Baikie has demonstrated that a small British settlement may be made a real centre of civilisation in a barbarous African region. The alliances

which he made with various chiefs, the moral influence which he exerted over them, and the good-will if not friendship of the natives which he acquired (his messengers and people travelling in perfect safety from Lukoja to the sea-coast), are the best tests of the value of his kind and conciliatory but firm and judicious conduct. The Orkney Islanders may well be proud of having produced such a man, and I trust that the right feeling which has guided his friends to erect a monument to his memory in his native town of Kirkwall will induce Her Majesty's Government to honour his services by aiding his bereaved family with a befitting recompense.

Mr. Hudson GURNEY.—By the death of this excellent man, at a great age, the cultivators of literature and archæology have lost one of their best supporters, whilst we lose an accomplished comparative Geographer. My old friend, Mr. Hudson Gurney had, in early life, the great advantage of having as his college friend and instructor that shining light, the late Dr. Thomas Young, who in subsequent years revealed to us the lost language of hieroglyphics, and who having expounded the great and novel theory of the undulations of light, justly obtained the never-to-be-forgotten *sobriquet* of "Phenomenon Young." Soon after leaving Cambridge Mr. Gurney travelled in Greece with the late Earl of Aberdeen, and thus became, as well as that nobleman, a true Athenian in his appreciation of the fine arts and knowledge of the most enlightened of all the Grecian people.

It falls to the lot of Earl Stanhope, the President of the Society of Antiquaries, to do justice to the merits of Mr. Gurney as a scholar and a virtuoso; whilst it is my special business to record that, as a collector, his invaluable library contained a most instructive assortment of maps of successive periods. So interested was he in the discoveries of Speke and Grant in the interior of Africa, and the approaching settlement of the great question of the Sources of the Nile, that he caused copies to be made of ancient maps of Africa, preserved in the Papal Libraries of Rome, in order to indicate the earlier state of our knowledge in that part of the world.

Serving many years as a Member of Parliament, and proving himself to be a sincere philanthropist by countless acts of charity and kindness, it may be confidently said of Hudson Gurney that in his long and well-spent life he ever gained friends and never made an enemy.

Rear-Admiral the Honourable Henry Anthony MURRAY.—By the death of Admiral Henry Murray, on the 17th of last February, the

Society has lost one of its warmest supporters. He served for several years in our Council, and seized every opportunity within his reach of advancing our best interests. No man of my time was more justly popular; for with his lively and joyous manner Henry Murray inspired his numerous friends with a kindred geniality. He had been for some years a severe sufferer from attacks of gout, one of which carried him off suddenly, to the deep sorrow of every one who knew his worth. I cannot do greater justice to his memory than by referring my hearers to a most lively, feeling and faithful sketch of our deceased associate, by one of his intimates,* which is given in the 'Spectator' of March 4th, p. 241. "There was" (says the reviewer towards the end of the sketch) "a singular breadth of sympathy and kindness of heart about the man himself, which was catching to all who came within his influence. It was impossible to remain shut up in the company of a man so unreserved and natural to be otherwise than kindly and good-natured in the presence of one who had not a dash of littleness, or meanness, or ill-nature in his whole composition; and the better you knew him the more you found out the depth of those qualities. No man of his means was more truly generous, though you might have known him long and well without detecting it except by chance; and while he helped all who were in temporal need with a large hand, he had always a ready ear for those who were in other kinds of trouble. With no claim to wit or wisdom beyond the common run of educated men, we cannot but think that he will be more missed than many of the wittiest and wisest."

Mr. Joshua BATES.—Belonging to the class of merchant princes of our metropolis, Mr. Joshua Bates was always a good friend of our Society and a just appreciator of the advantages derived from our pursuits. Intimately connected with the United States as a member of the great house of Baring, Mr. Bates's hospitable mansion was ever as open to the natives of the great Transatlantic Republic as it was to his numerous friends in this country, among whom I was proud to be enrolled; for I never met with any one more ready to contribute by his good-will and his purse towards the promotion of every good scientific, literary, or philanthropic cause. Among the deeds which will cause his name to be remembered, is the foundation of the great public library of Boston, in the United States, to which he contributed twenty thousand pounds.

* Mr. Thomas Hughes.

Having been a resident in various countries, he had a truly cosmopolitan heart, and in seeking to promote peace and good-will among men, his genial temperament so endeared him to those who had the good fortune to know him, that his memory will long be cherished. His only daughter having married that eminent scholar my friend M. Van de Weyer, the Belgian Minister, the large fortune amassed by Mr. Bates will descend to the children of that sound diplomatist, who has so thoroughly identified himself with the best feelings and has gained the respect of all Englishmen.

Archdeacon BURNEY.—Grandson of the author of the 'History of Music' and son of a distinguished Greek scholar, Charles Parr Burney was born in 1785, and was therefore when he died, in November last, in his eightieth year. This venerable, highly respected, and most companionable man, who was one of the original members of this Society, was from his youth a promoter of science, and became a Fellow of the Royal Society as early as the year 1814, under the presidency of Sir Joseph Banks.

Mr. Samuel CARTWRIGHT, F.R.S.—Eminent as a surgeon-dentist, the late Mr. Cartwright lost no opportunity of advancing the Fine Arts by a liberal and well-timed expenditure of his means. When British Art had few patrons, this generous amateur gave what was then considered the handsomest price for any picture which he esteemed, and I well recollect when a beautiful painting by Edwin Landseer and Calcott was exhibited at the Royal Academy, that on asking the late Marquis of Lansdowne if he had secured it, "No," his Lordship replied, "I cannot cope with Mr. Cartwright."

Mr. Cartwright's hospitality was hearty and profuse, and I have myself met at his table on the same day, an ex-king, two dukes, and other persons of rank, with several of my associates in science. He was a warm-hearted, benevolent man; and, with many of his old friends, I was much grieved when he was seized with a paralysis some years ago, from which he never completely recovered. He died on the 11th June, 1864. He was a Fellow of the Royal Society and of other learned bodies.

Benjamin SILLIMAN.—This time-honoured Professor of the United States, whose excellent 'Scientific Journal' had and still has a very wide circulation in America and Europe, died in November, 1864, at New Haven, in his eighty-fifth year.

An ardent promoter of science, and a lecturer on Chemistry, Mineralogy, and Geology, he visited Europe in 1820, and afterwards published his travels in England, Ireland, and Scotland. When he

revisited this country in 1851, I was much gratified in making the personal acquaintance of this distinguished American, who, although then in his seventy-second year, still retained a vigorous mind and an active body, and captivated a large circle of friends and admirers by his amiable manners.

Mr. Thomas YOUNG.—Though not a professed Geographer, my valued friend, Mr. Thomas Young (who died on the 11th October last), was so staunch a supporter of our Society, and had played so useful a part in public life, that I naturally wish to record his good qualities, however briefly. Born at Dunse, in Scotland, in the year 1784, he first pursued a maritime life, and having acquired a small independence, became a resident in London, where, betaking himself to literary pursuits, he was entered as one of the original members of the Athenæum Club. When the late Duke of Devonshire proceeded as Ambassador Extraordinary to St. Petersburg to congratulate the Emperor Nicholas on his accession to the throne of Russia, Mr. Young was in his Grace's suite. On that occasion he so attracted the notice of Lord Morpeth, afterwards Earl of Carlisle, that that accomplished and kind-hearted nobleman, being struck with his sagacity and capacity for business, afterwards befriended him by inducing Lord Melbourne to appoint Mr. Young his Private Secretary. In transacting the duties of that office Mr. Young obtained the good will of every one with whom he came in contact, and lost no opportunity of rendering popular the administration of his respected chief, who, in recompence for his zealous and effective services, appointed him to the office of Receiver-General in the Post Office.

Let me add that Mr. T. Young was beloved by a very large circle of acquaintances, in whose name and my own I offer this imperfect tribute to his memory to his widow, who thoroughly estimated the worth of so meritorious a man.

John George PHILLIMORE was the eldest son of Dr. Phillimore. He was educated at Westminster School, and obtained a second-class in classics at Oxford in 1827. In 1832 he was called to the Bar, was elected Lecturer on Jurisprudence at the Middle Temple in 1850, and Reader of Constitutional Law and Legal History in 1852. He was the author of 'History and Principles of the Law of Evidence' (1850), of 'Private Law among the Romans,' and of the first volume of a 'History of England during the Reign of George III.' Mr. Phillimore was a ripe scholar and a bold and earnest writer.

Henry CHRISTY had devoted many years to the study of the manners and customs of various races of men, and travelled extensively with this object in view. He explored all parts of Mexico, and also carefully examined the ethnology of North America, Northern Africa, and Scandinavia. He made numerous contributions to the collections in the British Museum, and latterly paid much attention to questions connected with the antiquity of man. With this object he investigated the caves in Dordogne, and made numerous important discoveries. Mr. Christy died suddenly in France; but not before he had been selected by the Council of the Royal Society as a Fellow of that body. His loss will long be felt by his fellow-workers in the interesting field of research which he selected for special study.

Admiral Sir James STIRLING entered the Navy in 1803, and attained his post-rank in 1818. In 1828 he took command of an expedition intended to form a colony in Western Australia, and he remained there as its first Governor until 1839. He subsequently commanded the *Indus* and the *Howe* in the Mediterranean, and was commander-in-chief on the China station during the war with Russia.

Mr. George DODD.—Mr. Dodd, formerly Member of Parliament for Maidstone, though not a writer in any department of science, was a praiseworthy and steady supporter of Science and Archæology, who acted as an efficient man of business in the conduct of the affairs of the Societies of which he was a member. This was conspicuously exemplified in the strict performance of his duties as a Manager and Visitor of the Royal Institution.

Vice-Admiral ROBERT FITZROY, C.B.—The melancholy task of sketching the characters of our deceased Fellows, several of whom were my intimate friends, had been completed when, alas! the mournful news of the death of one of the most distinguished of our Geographers burst upon me. The shock which this catastrophe gave to the general public was necessarily more afflicting to myself and numerous friends who had long known and highly estimated Robert FitzRoy.

A grandson through his father—Lord Charles FitzRoy—of the sixth Duke of Grafton, and by his mother the grandson of the first Marquis of Londonderry, young FitzRoy, who was born in 1805, entered the Navy in 1819, and obtained a Lieutenancy in 1824. After serving in the Mediterranean and South American stations he became Flag-Lieutenant of Admiral Sir Robert Otway on the

latter station, and was made Commander in 1828. I will not here attempt to trace all the public events in the chequered career of my lamented friend, for he was once in Parliament and afterwards Governor of New Zealand; but will dwell simply upon the two brilliant and eventful periods of his life which connect him with this Society,—his researches of eight years' duration in the surveying ships on both coasts of South America, and his recent labours as the Meteorologist of the Board of Trade.

One of the original members of our Society, FitzRoy won distinction as a geographical explorer so early as 1829, and of this we have a record in the first volume of our 'Transactions,' when that first-rate Naval Surveyor Captain Philip King, under whom he was trained, gave young FitzRoy all credit for his discovery of the Otway Water in the Straits of Magellan, and even named one of the chief sea-passages, FitzRoy Strait. We who were interested in all the contributions to Natural knowledge brought home by FitzRoy in 1831, can never forget the excitement which was produced in this metropolis by the arrival with him of a family of wild Fuegians. Prompted by a chivalrous philanthropy, FitzRoy expended, indeed, much of his private means in an endeavour to improve these poor people, and in imparting to them the blessings of Christianity; and, not only were they well cared for in England, but he had even engaged a vessel to take them back to their native land at his own cost. Being appointed in the mean time Commander of the *Beagle* on a second expedition, he took them with him loaded with presents and established them in their own country.

From 1832 to 1836, he continued the survey of the coasts of South America and the Falkland Islands, commenced by King, and completed it up to Guayaquil, on the west coast. The Geographical and other results of his prolonged voyage were finally laid before the public in 1839, in three volumes, accompanied by a valuable appendix and maps. The first volume relates to the earlier researches of the expedition when under the command of that truly scientific officer Captain Philip King, who, seeing how vastly FitzRoy afterwards extended the survey, generously assigned to him, although his subordinate during the first two years, the privilege of publishing the whole as a connected work. The third volume consists of the highly-prized Natural History and Geological results of the voyage, from the pen of Charles Darwin, who was associated with FitzRoy as naturalist of the expedition. Such was the wealth in scientific results gleaned during this memorable voyage,

that Darwin was led, in addition to the Natural History volume of FitzRoy's work, to publish in subsequent years three other works, in which he opened out entirely new views in Geology. These were, a treatise on Coral-reefs (1842), one on Volcanic Islands (1844), and his remarkable and philosophical observations on the Geology of South America (1846). It may be confidently said, that FitzRoy's voyage of the *Beagle* produced a harvest of fresh knowledge which from the combination of geographical, physical, and natural history results, is unparalleled in this century, and some of the best effects of which have been from year to year coming forth in the writings of Charles Darwin.

Such a grand feat as the surveying voyage of the *Beagle*, naturally excited the deepest admiration of all cultivators of science, and of Geographers in particular; and as one of those events in my own life of which I am justly proud I may be permitted to record, that I had the honour, in the year 1836, of moving in our Council the award of our then single Royal Medal to Captain FitzRoy. This conscientious Surveyor, unwilling to quit his South American station without rendering his services in every sense complete, had hired two additional vessels at his own cost, to finish off the examination of the coasts of the Falkland Islands, and subsequently purchased a third, besides fitting out the *Beagle* to a great extent at his own expence. But, as these gratuitous and noble efforts which cost him several thousand pounds had not been sanctioned by the Admiralty, he was never reimbursed; and being thus disappointed by the conduct of his rulers, he the more deeply appreciated, as he himself assured me, the full and ample recognition of his services bestowed on him by the Geographers in conferring on him their Gold Medal.

In the latest years of his life his acquirements as a Meteorologist, and his well-timed observations and suggestions, induced the Government to institute, under the Board of Trade, a Meteorological Office, superintended by Admiral FitzRoy, in the management of which he established the announcement to distant ports of coming storms, as gathered by telegraphic communication recording conjunctions of atmospheric phenomena at great distances. The labour which he bestowed in methodizing and classifying all the known data, and the skill with which he organized his new system of telegraphic forecasts, and the method he established of storm signals or warnings for the prevention of shipwrecks, deservedly obtained for him the thanks of the country and specially of all those engaged in mercantile and maritime pursuits.

Few as are yet the laws which Meteorologists have been able to establish beyond those of the storm-gyrations elaborated by Maury and Reid, Admiral FitzRoy has proved that even out of the variable and uncertain elements with which he had to deal, he could derive a great practical public benefit. The machinery which he contrived will now it is hoped only require the superintendence of a manager who will steadily guide the helm of the FitzRoy Weather Ship.

Besides his various labours, including the forecast of storms, Admiral FitzRoy has left behind him a great accumulation of precious documents respecting tides, currents, winds, and other phenomena of the ocean, which he has procured from the logs of ships in many quarters of the globe, thus following out the system of Captain Maury; and it is to be hoped that these documents may be turned to a really useful account.

In deploring the loss of this eminent man who was as truly esteemed by his former chief, the Prince of Naval Surveyors, Sir Francis Beaufort, as by his successors, I may be allowed to suggest that if FitzRoy had not had thrown upon him the heavy and irritating responsibility of never being found at fault in any of his numerous forecasts of storms in our very changeful climate, his valuable life might have been preserved. Being of a high-strung nervous temperament, and imbued with the loftiest sense of honour and fidelity to his charge, and agitated with over-work, the strain proved too great for the brain, which had surmounted so many difficulties, and the spirit of this high-souled man fled from this world, to the grief of his many friends and admirers, the anguish of his widow, and the deep regret of all his countrymen. I have only to add that, on the representation that this gallant officer died in impoverished circumstances, the First Minister of the Crown has promised to bestow a pension on Mrs. FitzRoy.

Admiral FitzRoy was a Companion of the Bath, a Fellow of the Royal, Astronomical, and other Societies, a Corresponding Member of the Institute of France, and had received honorific distinctions from several Foreign Sovereigns.

In addition to those deceased Fellows of the Society already alluded to, we have lost many good supporters, who, not directly connected with our pursuit, had attained positions in life which entitle their memory to respect. Thus, among Members of Parliament, there are the names of Mr. E. Divett, Mr. Samuel Gregson, and Sir Henry Willoughby, all of whom have proved themselves

worthy of the places they occupied; also Sir John Login, the accomplished Mentor of the Majorajah Duleep Singh, and Mr. Charles Dilke, the respected proprietor of the 'Athenæum' Journal.

The remainder of this mournful list (unusually large this year) is composed of the following names:—Mr. P. Anstruther, Sir A. Bannerman, Dr. Bird, Mr. E. Burmester, Mr. S. Cunard, Mr. A. B. Cator, Mr. H. D. Erskine, Mr. Stanhope Freeman, Capt. Gascoigne, Mr. M. Gore, Mr. G. A. Hoskins, Mr. T. C. Janson, Mr. J. Kalergi, Mr. J. G. Lumsden, Mr. Edward Lane, Mr. W. Moon, Mr. Joseph Martineau, Mr. R. C. Marsden, Mr. John Macdonnell, Major-General Matthie, Mr. R. R. Notman, the Rev. W. Oxenham, Mr. R. A. Long Phillips, Sir John H. Pelly, Mr. John Innes Pocock, Professor Rafn, Professor W. Ramsay, the Rev. Carter Smith, and Mr. G. Stoddart.

ADMIRALTY SURVEYS.*

The Admiralty Surveys, both on our own and on foreign coasts, have made fair progress during the past year: the hydrographical examination of the shores of the United Kingdom has indeed been so far completed that it has been considered desirable to break up some of the small parties which had been employed in special localities and over limited areas, and to adopt a more comprehensive system with the view to meeting those changes which through time and the operations of Nature must ever be recurring on such a coast as ours.

Two small, but suitable and efficient, steamers have been accordingly set apart by the Admiralty for this purpose—the *Lightning*, under an able surveyor, Captain E. J. Bedford, and the *Porcupine*, under Staff-Commander Calver—and thus those labours will be continued which have hitherto proved of so much advantage to commerce and added materially to the security of life and property. These two vessels, together with the Channel Islands Survey, which is conducted by boats, with the occasional assistance of a steamer, and a small establishment to observe and record the changes which are being produced by artificial means at and near our great naval arsenal, Portsmouth, will constitute the home surveying force for the present year.

Some modification of the system on which our foreign surveys

* By Captain G. H. Richards, R.N., Hydrographer.

are conducted has also been introduced, and, if found to succeed, will probably be extended. This consists in appropriating one of the small ships of war on each station as an auxiliary surveying vessel, being commanded and officered out of that branch of the profession, and hence available for any extraordinary duties that may be required. The rapidly-increasing commerce with China, and the vast extent of its yet partially-explored coasts, point to that country as the first where this auxiliary force may with advantage be employed; and therefore, in addition to the two vessels exclusively engaged on surveying service there, H.M.S. *Serpent*, under Commander Bullock, an officer of much experience in the China Seas, has just been despatched to that station.

English Coast.—Staff-Commander Calver has extended his examination of the estuary of the Thames along the coast of Suffolk, and has prepared the way for a re-survey of the shoals and channels between Lowestoft and Yarmouth,—a work which is imperatively called for. He has likewise made considerable progress towards the completion of an entirely new survey of the Downs, which from the great changes which were found to have taken place was also much needed, and will be completed during the early part of this season. The re-survey of the estuary of the Thames by this officer, and which was noticed as having been completed in our last Report, is now published, and is, perhaps, one of the most important aids to navigation which has been given to the world for many years.

Captain George Williams, of the *Bann*—one of our oldest and best surveyors—having retired early in the season, his place was filled by Staff-Commander Osborne, who has been employed in completing the deep soundings off the coasts of Cornwall and Devon and on other useful work.

The south shore of the Bristol Channel, between Combemartin and Watchett, has been closely sounded by Commander D. Aird and his two assistants in the *Asp*, and is a work which will prove of much utility to the rapidly-increasing trade of that part of the kingdom.

Commander Brooker has made a very close re-survey of the bar of Portsmouth Harbour to ascertain the effect produced by the dredging of the previous year, which has satisfactorily proved that much benefit in an increased depth has resulted, and that more, and of a permanent character, may confidently be expected from further operations.

Captain E. J. Bedford and his five assistants have completed the

surveys of the islands of Coll and Tyree, off the west coast of Scotland, and have also surveyed Loch Sunart, on the main, both on a large scale and with great minuteness, and have thus brought to a close the in-shore examination of this deeply-indented and intricate coast-line; while Mr. Stanton, Master, R.N., with one assistant, in the *Shamrock* gunboat, has carried the off-shore soundings to an average distance of 60 miles from the coast between Ireland and the Hebrides, embracing an area of 3600 square miles,—a work which required both skill and perseverance. Mr. Stanton, in the course of this service, discovered several fishing-banks of considerable extent and value in the same neighbourhood.

The survey of the Channel Islands, under Staff-Commander John Richards, has progressed steadily and satisfactorily. The intricate nature of this work, studded as the coasts are with innumerable hidden dangers, will be better estimated by an examination of the chart and a knowledge of the difficulties to be encountered than by any written description.

Foreign Surveys.—The Mediterranean surveys have been carried on during the past year by Captain Mansell in the *Hydra*, and Commander Wilkinson in the *Firefly*. The former has been employed on the western coast of Greece, and has examined the mainland from Murtza Bay to Oxia Island, together with the southern shore of the Gulf of Patras and the islands of Santa Maura, Cephalonia, Ithaca, with some smaller adjacent ones. Plans of the Strait of Prevesa, Roadstead of Santa Maura, Port Vliko, Argostoli Harbour, Gulf of Molo, Patras Road, and Ports Platea and Petala, have been received from him and will be published with all convenient speed. Commander Wilkinson, in the *Firefly*, has been employed in sounding the Malta Channel and determining the true position of actual dangers or expunging doubtful ones which were shewn on the charts. He has also re-surveyed a considerable portion of the coast of Tunis, where many inaccuracies were found to exist, as well as the western portion of the island of Sicily and its off-lying dangers.

Newfoundland.—Captain Orlebar, after an active service of thirty years on surveying duties in the St. Lawrence, the coasts of Nova Scotia and Newfoundland, has retired and been succeeded by his chief assistant Mr. J. H. Kerr, Master, R.N., an officer favourably known by his works in New Zealand, China, and other parts of the world. The work performed by Captain Orlebar and his two assistants during the last year includes the greater part of Trinity Bay, in Newfoundland, with a portion of the coast between it and

Cape Bona Vista, as well as plans of Trinity Harbour and Heart's Content, the latter being the proposed terminus of the Atlantic cable. They have likewise examined the inner edge of the Grand Bank off Cape Race, and Captain Orlebar has afforded his counsel and assistance in the selection of the termini for the Atlantic cable, and that between Newfoundland and Nova Scotia.

Nova Scotia.—By the exertions of Captain Shortland and his five assistants but little remains to complete the coast survey of this colony, which, it is believed, will be brought to a close during this year: but notwithstanding that an area of 4000 square miles of deep sounding has been completed during the past season, there yet remains a very considerable examination of the banks to be made before the approach to this coast, which is enveloped in fog for so many months of the year, can be considered free from danger.

West Indies.—Mr. Parsons, Master, R.N., with his two assistants, has been employed in surveying the coasts of the island of Tobago, and, considering the limited means at his disposal and the delays incident to an unhealthy season, they have made favourable progress. Captain Pullen is still employed in examining the coral-reefs of the Bermudas principally with a view to the removal of obstructions, rendered necessary by the increased length and draught of modern ships. He also has been much retarded in his operations by the severe epidemic which raged at Bermuda during many months of 1864.

British Columbia.—Mr. Pender, Master, R.N., with his three assistants, are making very favourable progress with the examination of the northern portions of this colony, and the results of their labours, together with the latest surveys of the sister colony of Vancouver Island, are being promptly placed before the public.

Australia.—Four distinct surveys, under the conduct of naval officers, are being carried on in these colonies, at the joint expense of their Governments and the Admiralty. In Victoria, Commander Cox, with his three assistants, having completed the extensive estuary of Port Phillip, with its various anchorages, on scales of 6 inches to a mile, is proceeding with the examination of the coast to the eastward. The preparation of the charts is in a very forward state, and they will shortly be issued to the public. In New South Wales considerable progress has been made, Commander Sidney and his two assistants having during the past season almost completed the coast between the Solitary Islands and Point Danger (the northern boundary of the colony), and these coast-sheets of this

survey are being published with due despatch. Staff-Commander Jeffery, in charge of the Queensland Survey, with one assistant, has completed the survey of Keppel Bay and part of Sandy Strait, the latter of which is published.

South Africa.—The survey of the coast of the Cape of Good Hope Colony, under Mr. Skead and his assistants, is in progress, and during the last season Plettenberg Bay and other portions have been surveyed; but owing to the difficult and exposed nature of this coast, together with the limited means employed and other unavoidable drawbacks, its progress has not been so rapid as could be desired.

China and Japan.—Commander J. Ward, in the *Rifleman*, has been employed in the examination of the numerous dangers which stud the China Sea, and in making clear the two great highways between Singapore and Hongkong. The positions of the Vanguard, Prince of Wales, Alexander, and Granger banks have been correctly determined and their localities carefully sounded. The non-existence of some imaginary dangers has also been proved and their names removed from the charts. The *Swallow*, under the command of Mr. Wilds, Master, R.N., with her tender the *Dove*, Mr. Stanley, has been employed on the northern coasts of China. They have completed a re-survey of the entrance to the Yang-tse-Kiang, which has been published, and have added considerably to the soundings off the coast between Hongkong and Chusan, as well as in the Formosa Channel, and have surveyed the port of Swa-tau. The operations of these vessels have, however, been somewhat retarded during the past season by the local disturbances in China.

During the year 1864 sixty-nine new charts have been engraved and published by the Hydrographic Office of the Admiralty, while additions and corrections have been made to about 1400 former ones. The number of charts printed during the year has been 203,770. The annual tide-tables and lists of lights, together with seven new books of sailing-directions and numerous pamphlets and hydrographical notices, have likewise been published, as well as a series of azimuth tables, by Staff-Commander Burdwood, showing the sun's true bearing for every four minutes of time between the parallels of 48° and 56° of latitude.

Review of the Progress of Geographical Knowledge since the Foundation of the Society.—I should not have ventured to undertake a retrospective view of the progress of Geography since the foundation of

our Society, had I not been supported by the labours of some of my associates, of whom I must particularly mention that accurate geographer, Mr. A. G. Findlay, who has furnished me with the details and coloured statistical maps respecting Australia.

The new discoveries, and their results, which have been made in the last third of a century, have, from their area and importance, been unexampled in our history, even when contrasted with former periods of much greater length; albeit from the days of Elizabeth to those of George the Third many brilliant enterprises were carried out, which reflect glory on the adventurous spirit of England. With the surprising advance made in our own times, it is my pride, as your President, to say that our Society has been intimately connected, partly through the encouragement held out to travellers by our rewards and the publication of our volumes, and greatly by the impulse we have given to many enterprises originated among us, arising from that happy mutual intercourse and good-fellowship which has ever shone forth in our body.

Allow me, then, to remind you that when, in 1830, this Society was established, and when our founder, Sir John Barrow, assisted by a few individuals, drew up those laws* by which we have since been guided, the state of geographical science was very different indeed from what it now is. At that period the magnificent surveys by sea and by land, now so far advanced over many parts of the world, had barely been commenced, even in Eastern and Southern Europe, and the grand Asiatic possessions of Russia were most imperfectly developed. Asia Minor had been little traversed by men of science or scholars, whilst we knew less of Syria, the cradle of Christianity, than we now do of parts of Inner Africa. Of China, shut out as it was from the rest of the world, we had only a dim perception, chiefly through Jesuit missionaries: Japan, as a whole, was utterly unknown, except the neighbourhood of a Dutch fort and colony. The mountainous regions of Northern India had been only partially

* The first Committee which assembled to draw up those laws by which the Society is still governed, consisted of our leader Sir John Barrow, the Hon. Mount-Stuart Elphinstone, Sir John Cam Hobhouse, now Lord Broughton, Mr. Robert Brown, the renowned botanist and companion of Flinders, and myself. We were all members of the then Raleigh Club of Travellers, in which the scheme of a Geographical Society was first mooted. In the same year my eminent friend Admiral W. Smyth, C.B. (to whom, as our former President, the Society was infinitely indebted for the presidency during which our present prosperity began), also sketched out the project of a Geographical Society and enrolled many names. These projects were merged in one when Sir J. Barrow engaged the Earl of Ripon to become our first President, as stated in our first volume, in which no notice, however, is taken of the origin of the Society.

explored, and we then had no idea of the striking fact that the culminating peaks of the Himalayas far exceeded in height those of the Andes. Australia, now among the most advancing of British colonies, was, as regards its vast interior, nearly a perfect blank; and the coasts of New Zealand had been visited only by a few whale-fishermen and missionaries. When we turn to Africa we are compelled to admit that in 1830 we were even ignorant of much that was described by Ptolemy. Thus the course of the Nile was only known up to Khartum, and that of the Niger was entirely unknown, as well as that of the great Zambesi of Livingstone. In South Africa all the interior north of the Kalahari desert was supposed to be a vast sandy wilderness, instead of what we now know it to be,—an enormous plateau of rich lands, irrigated by great lakes and streams. In North America, notwithstanding that our ancestors and their enterprising descendants, now a great and separate nation, had made wonderful progress in the knowledge of the country, a vast region in the north and north-west of the continent had been little visited, our knowledge of the latter particularly having remained stationary since the voyage of Vancouver. And lastly, with the exception of what Parry and his followers had so admirably laid before us, the Polar regions were a blank; and it was not till the chivalrous adventure of Franklin elicited the ardour of search for the remains of that heroic explorer that our national geographical distinction was raised by the delineation of vast tracts wholly unmarked on any old maps. Nor, when we began our labours, had the skilful perseverance of James Ross penetrated beyond that which was considered an impassable barrier by Cook and the earlier voyagers, and opened out to us the great Antarctic Ocean, with its lands, ice-clad mountains, and volcanos.

As I cannot attempt to recall to your recollection all those advances, of most of which records are to be found in our Journal, I must restrict myself to comments on certain points only. I commence, then, by noticing the immense strides made by the newest of the great British colonies, both because this Society has been intimately connected with all Australian discoveries for a third of a century, and because there is no example in the whole range of British history of more striking and rapid progress having been made through the energies of our countrymen.

Not now dwelling on the first discovery of this continent by the Portuguese, or the subsequent examination of its coasts by the famous Dutch navigator Tasman, nor even adverting to the

voyages of Cook, and the first partial settlements, including the origin of the earliest colony, that of New South Wales, let me confine my view to what was the condition of this vast country when our Society was originated. In this way we may well notice some results of the most memorable Australian explorations, the leaders in which this Society has invariably rewarded with its medals and testimonials.

In 1830, the year of our foundation, the only great colony we possessed in Australia (for Swan River Settlement, now West Australia, had only just been formed) was New South Wales, which had a population of near 50,000 inhabitants, spread at wide intervals over an area of about 34,500 square miles, whilst the utmost extent of distant tracts loosely reported upon did not exceed in all 82,000 square miles. It was during the government of our gifted associate, General Sir Thomas Brisbane—a good astronomer and a distinguished lieutenant of Wellington—and also under his successor, Governor Darling, that due encouragement was given to explorers to penetrate beyond those mountains or ranges of hills which in Eastern Australia form a “Cordillera.”* This effort, commenced in 1814, led only to the impression that the Macquarie and Lachlan Rivers terminated in marshes, and that the whole of the interior would be found to be a shallow basin of water, if not a great inland sea.

In the second volume of our Journal Mr. Allan Cunningham gave us a clear account of the progress of exploration, including his own successful journey of 1829. The aggregate, however, of all the travels then made by various individuals did not exceed the number of miles which single travellers, such as Sturt, Eyre, Leichhardt, A. Gregory, MacDouall Stuart, M'Kinlay, Landsborough, Burke and Wills, and others, have since accomplished. But the encouraging sketches the earliest explorers gave of well-watered tracts, and of grounds well suited for sheep pastures, naturally led to further researches, and a greatly-extended occupation.

In Western Australia the new settlers at Swan River had made but slight efforts to penetrate into the interior, and all the knowledge of this region which we then possessed is given in the first memoir, a very striking one, published by this Society.† In

* In the President's Address of 1844, I first applied the term “Eastern Cordillera” to this range, so well described by Strzelecki.

† ‘State of the Colony of Swan River, from Capt. Stirling's Report.’ By John Barrow. ‘Journal R. G. S.,’ vol. i. p. 1.

Northern Australia the temporary posts (for they were not settlements) occupied in Apsley Strait and Port Essington added scarcely anything to our acquaintance with the interior.

Such was the state of geographical knowledge respecting Australia when this Society arose. We had then, thanks to the surveys of that excellent hydrographer, Flinders, a pretty exact knowledge of the eastern and southern coasts and also of portions of the north coast; but of the vast interior we scarcely knew above a fortieth part, and most of that only as derived from the imperfect observation of the first rude explorers. Discussions were then, indeed, much in vogue among us, as to the real nature of the great unknown interior, which it was supposed would prove to be either a desert or possibly great inland sheets of water, according to the observations of travellers in alternating seasons of drought and rain. The one thing, however, which was established was, that flocks of sheep could be successfully pastured far in the interior, and thus the occupation of new lands was rapidly augmented.

In an extended geographical sense the first clue to the true nature of the interior was obtained by Capt. Sturt, the patriarch of the explorers of Inner Australia. After a first journey in 1828, and his discovery of the Darling, this meritorious officer, who was afterwards justly honoured with our Medal, pushed on beyond the Murrumbidgee, and, embarking on a noble stream, which he called the Murray, sailed down it to Encounter Bay, upon the southern seaboard. This long journey of more than 2000 miles, through hitherto unknown lands, opened out new vistas for the geographer and the colonist. To the one it made known a grand water-system of which we had been totally ignorant, and to the other it presented the prospect of establishing a colony towards the mouth of the great stream; and hence South Australia was founded in 1834.

We next had to dwell with deep interest on the researches of our associate Eyre, who, in 1837, discovered and passed over those extensive plains which lie to the north of the present colony of Victoria. Baffled in a subsequent endeavour to penetrate northwards by a belief in the existence of the great watery depression called Lake Torrens, he next, by the advice and encouragement of Governor Gawler, proceeded to the west, and made that journey along the southern coast lying between South and West Australia, which, for resolution under the severest privations, is scarcely to be paralleled in the annals of research.

This arduous journey proved the non-existence in all that region of any rivers emptying themselves into the sea, and the saline and barren condition of the country he traversed. These large additions to our geographical knowledge were of course duly recognised by presenting our Gold Medal to Mr. Eyre, now worthily the Governor of Jamaica.

On the western coast the infant colony had made little progress for some years, when two young officers, Lieutenants Grey and Lushington, panting to do something in those piping times of peace, endeavoured, in 1837, to penetrate into the interior from the north-western face of the continent. How they discovered new rivers, the chief of which they called after Lord Glenelg, the liberal and enlightened Minister of the Colonies, who sent them out, and another stream after myself, because I had been their zealous supporter, is recorded in our volumes, as well as how their survey was eventually put an end to through the hostility of the natives. Yet this expedition led to good results; for, by identifying himself with Western Australia, Lieutenant Grey became eventually its Lieutenant-Governor, and there acquired so much reputation as eventually to be appointed Governor of New Zealand, afterwards of the Cape of Good Hope, and again Governor of New Zealand.

During the period of these expansions of geographical knowledge, the germ of the now rich province of Victoria had been sown. As early, indeed, as 1803, a few stragglers from Van Diemen's Land, now Tasmania, had squatted on the present site of the flourishing city of Melbourne. But this effort under Governor Collins failed; and it was not until this tract was again occupied—nor, indeed, until the opening out of its auriferous wealth—that the Colony became so very important.

The favourable account given by that skilful and indefatigable explorer Sir Thomas Mitchell, the Surveyor-General of New South Wales, of the country which had ever lain in its primeval solitude, determined Sir R. Bourke, the Governor of New South Wales, to take regular possession of it, though at that time no suspicion existed that gold abounded in the territory.

Shortly after the establishment of the new Colony now called Victoria, my distinguished friend, Count Strzelecki was occupied during five years, and entirely at his own cost, in exploring nearly the whole of the hilly region of Eastern Australia, from the high mountain which he named Mount Kosciusko on the south, at an altitude of 6510 feet above the sea, to the northern tracts now

forming part of the new Colony of Queensland. In his excellent work descriptive of the geological structure of New South Wales, and also of Tasmania, he indeed made no mention of the existence of gold, and the reason has since transpired. He had discovered gold, but was bound to secrecy by Governor Sir G. Gipps, who feared the effect of the announcement of such a phenomenon in the midst of a rural and pastoral population, among which were many convicts.*

Before the Colony now called Victoria attracted so much attention from the great amount of its auriferous wealth, the parent Colony of New South Wales was fully alive to the solution of great geographical problems respecting the vast unknown interior. The most striking of the attempts was that made by Dr. Ludwig Leichhardt, who left the station of Moreton Bay (now the thriving Colony of Queensland), in October 1844, and arrived at Port Essington, in North Australia, after a journey of thirteen months, in which he passed through many districts admirably adapted for settlers, large portions of which have since been occupied, and are now pastured by sheep. This grand work obtained our warmest approbation, and the donation of our Gold Medal in 1846. But before this time the

* At that time I was exploring Russia and the Ural Mountains, and in the latter region had full opportunities of studying the character of the auriferous rocks. Making the acquaintance of Count Strzelecki on my return, I was gratified by him with an inspection of all the characteristic rock specimens of Eastern Australia described in his work, then about to be published (1844); and I at once expressed to him my belief, that, from this resemblance to the Uralian rocks, Eastern Australia would prove to be an auriferous region. Convinced that gold would be found there, I urged the Cornish tin-miners, then (1846) much out of employment, to emigrate, and dig for gold in Australia; and in 1848 I received specimens of the ore from two of those emigrants. Thereon I wrote to the Secretary for the Colonies, pointing out that my hypothesis had been proved to be an important fact, and suggesting that means should be taken to regulate and methodize the opening out of gold works, or that great confusion might ensue. The Government considered it prudent to keep the fact secret, as its announcement might throw into confusion a great pastoral country. I, however, persevered in expressing my belief of the coming shower of gold, in a memoir read to the British Association, in a lecture at the Royal Institution, and in an article in the 'Quarterly Review,' entitled 'Siberia and California, 1850.' These views were all promulgated anterior to the year 1851, when Mr. Hargreaves, by first practically opening up the gold diggings, caused a sensation almost equal to that which pervaded the civilized world when the precious metals were first discovered in America. I merely allude to these facts, not to claim any merit for myself except that which is due to a fair geological induction from the data known to me at a time when I was in entire ignorance of any discovery of gold having been made. The proof of my ignorance in 1844, that anyone had discovered a fragment of gold in Australia, is seen in the language I used in that year, being then your President, when I expressed my surprise that no gold had yet been detected in rocks, which, according to analogy, ought to have afforded it. It is right also to make this statement quite clear, in justice both to my valued friend Count Strzelecki, and also to the Rev. W. B. Clarke, both of whom had, as it afterwards appeared, really discovered gold, though neither of them published the fact, and they certainly gave me no hint on the subject. The maintaining of the secrecy which was imposed by the Governor of New South Wales was rigidly observed and was highly honourable to Count Strzelecki.

veteran Sturt had submitted (in 1843) a general plan for the survey of the continent from north to south and from east to west, though this plan was much modified by his instructions. Starting with MacDouall Stuart as his aid, he traversed the lower courses of the Murray and Darling rivers in his way northward, and, after great privations, under an intolerable heat, he reached, in 138° east longitude, a sterile desert of clay. During this trying service the heat in the sun was 157° Fahr., and in the shade 132° . The hair and nails of the men, and even the wool on the sheep, ceased to grow; wooden implements were shrivelled up, and even those made of horn separated into hair-like filaments; yet the travellers preserved their health, though in the same spot the temperature soon after fell to 24° Fahr. Thus did the pluck and fortitude of our countrymen prove the adaptability of the human frame to the most excessive variations of climate.*

Let me here remark, that at this very time our Arctic explorers were living in comparative comfort, as they thought, with a difference of temperature, as compared with the Australian heat, greater than that which exists between ice and boiling water! Captain Sturt made another and ineffectual attempt to cross the continent, in which, however, he discovered Cooper Creek, subsequently the base of operation of the ill-fated expedition under those noble fellows Burke and Wills. Having also visited the tract occupied by the so-called lake, now known to be in a dry season a desert of stones or of baked mud, the conviction was shared by most geographers, and was dwelt upon by myself in Anniversary Addresses,† that the interior country northward would probably also be found to be an unprofitable desert. This idea was indeed strengthened when Augustus Gregory, in 1856, advancing southward from the Victoria river of North Australia, also reached an inland saline tract. This impression, however, that all the interior was of that sterile character, has now been proved to be erroneous, particularly by the subsequent travels of MacDouall Stuart, and also by those of Burke and Wills, M'Kinlay, Landsborough, and Walker. The grand discoveries of Stuart, as well as the efforts of Burke and Wills, under the able government of Sir H. Barkly, obtained our highest rewards, whilst we conferred honorific testimonials on the other explorers.

By persevering marches northwards, it has been now ascertained,

* See 'Journal Royal Geographical Society,' vol. xvii. p. 115-18.

† See particularly the Address of 1858.

that, whatever amount of sterile or desert land exists in the heart of the continent, the character of the country north of 27° s. lat. changes essentially, and that Tropical Australia is, on the whole, rich and fertile. But, before the last-mentioned journeys were made, there was, alas! one forecast of the fate of Burke and Wills. In 1848 Leichhardt undertook a second expedition, which promised greater results than his earlier efforts, towards the north-east, by taking a more inland course. The fate of this intrepid and skilful traveller has been for seventeen years a mystery, and, recently, I learn from the celebrated botanist, Dr. Mueller, of Melbourne, the companion of Augustus Gregory in his traverse from North Australia, that he has been urging the inhabitants of Victoria to institute a new search, to ascertain the true fate of the bold and accomplished explorer and his party. In a lecture given at Melbourne in February last, Dr. Mueller recounted the various hypotheses respecting that mysterious journey, and eloquently advocated that this fresh search should be made under the guidance of the experienced traveller Mr. M'Intyre, who, having recently come from the border of the interior region in question, distinctly asserts his belief that Leichhardt's route and fate may still be discovered. The ladies of Melbourne, feeling just as keen an interest in solving this problem as we all in England did in unveiling the fate of Franklin, have commenced a subscription to fit out the requisite expedition. Heartily wishing them success, and desirous that some of our countrymen and countrywomen may join in supporting this noble effort, I cannot better aid the cause than by quoting a few of the stirring words of Dr. Mueller:—

“ In the absence (says he) of all tangible evidence of his fate, it is not less wrong to maintain that Leichhardt must be dead than to assert that he must be living. We have no right to shelve the unsolved question by mere assumption. We have no right to evade exertion, which may still save him from destruction. And, even if all exertions should prove futile—even if we altogether failed to draw away the veil which hangs over Leichhardt's fate, one noble object will be gained,—we shall have displayed that chivalrous spirit to which we owe so many great and noble deeds. . . . And with that endeavour will be mingled the lofty feeling of having advanced, simultaneously with our work of humanity, the revelation of the true nature of the interior of this vast continent.” *

* To assist in this good work, a subscription list has now been opened at the offices of the Society; Lady Murchison's name being at the head of it.

The expeditions already alluded to had given us a pretty clear idea of the south-eastern portion of Australia, or about one-third of its area. In the south-western district, or West Australia, no inland excursion to the east had exceeded 200 miles from the coast, chiefly accomplished by Frank Gregory and Lieut. Helpman.

In 1853 this Society urged upon the Government the desirability of an expedition to explore North Australia; and in 1854, the Government having undertaken to promote one, four members of the party left England, to unite with Mr. Augustus Gregory their leader. Well fitted out in New South Wales, under the direction of our enlightened associate, the Governor, Sir Wm. Denison, this expedition passed from Moreton Bay, now Queensland, round the north-eastern division of the continent, and landed to the east of Cambridge Gulf, at the mouth of the Northern Victoria River. Thence, leaving a depôt under Mr. Wilson, who with his party remained there ten months, fully proving that our countrymen could there live in health, Gregory first advanced s.s.w., but, repelled by an arid country, he went eastward, over the table-lands of sandstone which separate the Victoria valley from the Gulf of Carpentaria. From the head of that great water he travelled in a south-easterly direction, bringing to light vast tracts of new and rich lands, to which the colonists of Queensland are now rapidly extending their occupation, and, with his companions, Mueller, the celebrated botanist, Mr. Elsey, and Mr. H. Gregory, he terminated his very successful journey at Port Curtis and Moreton Bay. As in this, and other expeditions, Mr. Augustus Gregory had thus travelled 6500 miles, chiefly on foot, and had determined numerous geographical positions of longitude as well as latitude, never certainly had any one established a stronger claim to our highest reward. Again, he earned our hearty praise by making another bold effort to examine the interior from the east, partly to endeavour to discover traces of Leichhardt; but the result of this endeavour was not so fortunate, for, though he issued by South Australia and Adelaide, the country which he passed to the north of Cooper Creek gave little assurance of any tract fit for occupation.

It was then that those efforts began in South Australia which have been so signally successful in exploring northwards in search of better lands. Notwithstanding the discouragements produced by the journies of Sturt and Eyre, and partial failures in the environs of Lake Torrens, MacDouall Stuart, the companion of Sturt, was nothing daunted. Aided by the speculative spirit and generous assistance of Mr. Finke, Stuart started on his first independent

journey in 1848, and traversed the country to the west of Adelaide, between Mount Eyre and Streaky Bay. Next, supported by Mr. Chambers as well as Mr. Finke, he undertook two expeditions in the environs of Lake Torrens, which had small results. In March 1860, however, he proceeded due north, with the resolve to traverse the continent to the north shore. In this, his fourth effort, he reached, after great difficulty, the very centre of the continent, and, instead of an inhospitable desert, or an inland sea, he found there a well-watered, rich, and grassy region. Pushing on to s. lat. $18^{\circ} 17''$, E. long. 134° , he was driven back by the hostile natives, and returned to his depôt at Chambers' Creek. Again he advanced, and gained 100 miles more, but was foiled by impenetrable forest and scrub, and then unwillingly came back to Adelaide. Still the crowning honour was to be won, and MacDouall Stuart was not the man to falter. Under the auspices, on this last occasion, of the South Australian Government and the zealous Governor Sir R. G. M'Donnell, a month sufficed to restore his shattered health, and again we find him advancing. Now, shaping his course so as to avoid the former obstacles, he finally reached the sea in Van Diemen's Gulf, and there unfurled the British flag.

I have thus dwelt for a few moments on the wonderful efforts of MacDouall Stuart, because they have brought about the establishment of a colony on the north coast of this continent—an object which has long been a dream of my own, and which I rejoice to see thus realized in my lifetime. In the year 1844, when I presided over this Society, and again in 1857, I earnestly urged the forming of settlements on the coast of North Australia, for political and commercial purposes of deep interest, showing how much we should lose if any other nation were to step in and take possession of some of those noble bays and harbours. In the last-mentioned of those years, my appeal was thus concluded:—"Let us trust, that, if such a consummation [a settlement in North Australia] be obtained, the proposers of it may not be forgotten; and that it may be remembered, that the North Australian expedition, now happily completed under the direction of Her Majesty's Government, was a child of the Royal Geographical Society."*

The northern limits to which the pasturage of sheep can be extended into Intertropical Australia has been so pointedly commented upon in my last two Addresses, as certified by the explorers

* 'Journal Royal Geographical Society,' vol. xxvii. p. 459.

Landsborough, M'Kinlay, Wilkes, and numerous new settlers, that it is unnecessary now to dwell upon the physical conditions which, in my opinion, have established the somewhat unexpected fact, that sheep will thrive in those intertropical lands, whose rich vegetation and considerable altitude above the sea necessarily produce a more moist and temperate climate than exists in sea-girt lands in the same latitude. In this case, as in former vague theories respecting Central Africa, experience alone dispels error, and teaches us the truth; and, just as the interior desert or supposed inland sea of Australia has vanished from our speculations before the data accumulated with great toil by our bold explorers, so the dogma that sheep and cattle could not thrive in large intertropical portions of this great Continent has, to a great extent, been set aside by the spirit and enterprise of our daring colonists.

In concluding this incomplete summary of some of the chief geographical operations in Australia since the foundation of our Society, I must here say that no one of our Associates at home has more sedulously noted each fresh addition to our knowledge, in excellent maps, than Mr. Arrowsmith, who, for such works and many other labours relating to these and other distant regions, of the highest value to all geographers, was justly honoured with one of our Medals.

With the progress of exploration, nearly two-thirds of Australia have now been either settled or partially explored, whilst the population, which, in the year 1830, amounted only to about 50,000, has risen to near a million and a half of inhabitants. With establishments at Cape York, Van Diemen's Gulf, and, I hope also soon to add, at the mouth of the Northern Victoria River, and, thanks to our admirable naval surveyors, with a secure passage laid down for all vessels navigating northwards within the barrier-reefs of the east coast, by Queensland to Torres Straits, this generation will not pass away before a brisk intercourse will be established between Australia and our East Indian possessions, China, and Japan.

I now see rapidly approaching, that consummation which some of my less sanguine friends looked upon as a dream, when, in a former Address,* I said, "I have little doubt that the time will soon come, when all minor difficulties will disappear before the energy of British colonists, in their endeavours to connect their Australian possessions with the rich marts of the Eastern hemisphere."

* Address, 1857.

Asia.—In so far as concerns Asia and its archipelagos, a vast improvement, both as to extent and accuracy of geographical knowledge, has taken place since the first formation of our Society, and we may take credit to ourselves for the degree in which we have contributed towards it. Exclusive of what has been put on record in our Proceedings, the volumes of our principal publication, the *Journal*, contain 34 memoirs on Hindustan and the countries adjacent to it north and west; 13 on the Hindu-Chinese countries, or the tropical region between the country of the Hindus and that of the Chinese; 12 on the Malayan Archipelago; and 11 on China.

At our Meetings, instructive discussions have followed the reading of these Papers, as well as of some contributions in our Proceedings, frequently in the presence of their authors, parties personally acquainted with their subjects taking a part in them. The greatest number of our recorded contributions regard India proper, in which, as our own, we have a deep and almost domestic interest when we consider that we have incurred the responsibility of governing a country fifteen times the extent of our own Islands, with fivefold the number of their inhabitants. Since the institution of this Society, our acquaintance with the countries adjacent to Hindustan, to the north and south, namely, the Himalayas, Nepaul, Thibet, Cashmere, Cabul, and even remote Bukhara, amounts to a geographical revolution. The names of a few of the more prominent labourers in this wide field may be mentioned, and among them will be found Fellows and Medallists of this Society. In the long list we find such names as those of Sir George Everest, Sir Andrew Waugh, the brothers Captain and Dr. Gerard, Colonel Richard and Major Henry Strachey; Colonel Strange, Colonel Thuilliers and Captain Montgomerie. The physical geography, botany, and natural history, including the phenomena of glaciers in this region, have been specially illustrated by the labours of such men as Dr. Joseph Hooker and Dr. Thomson, and, above all, of the late lamented Dr. Hugh Falconer, who have been followed quite recently by Captain Godwin-Austen.

With regard to the Hindu-Chinese countries, although our knowledge is still but imperfect, the progress of our acquaintance has yet been very remarkable. On the eastern shore of the Bay of Bengal we are in possession of a domain nearly equal in extent to Great Britain, which is under the enlightened administration of Colonel Phayre. This territory, with its sparse population of a million, and which was at one time deemed a worthless acquisition, has turned

out, in so far as foreign countries are concerned, the chief granary of India, furnishing ourselves with 3,000,000 cwts. of rice yearly, and supplying us, moreover, with all the teak-wood indispensable to the construction of our ironclad navy.

With respect to other Hindu-Chinese countries—Siam, Laos, Cambodia, and Anam, or Cochin-China and Tonquin—although great progress has been made, still much remains for exploration in a field which embraces not less than 15 degrees of latitude and 10 of longitude. The principal labourers in this quarter, and whose contributions are to be found in our records, are the late Sir Robert Schomburgk, the late M. Mouhot, and Dr. Bastian. In this direction we have reason to expect much geographical knowledge from the officials and colonists of the extensive conquest which the French have within the last few years made in Lower Cambodia.

But it is in the great and industrious empire of China, with its computed population of four hundred millions, that geographical discovery has been most conspicuous. When this Society was founded, our accurate knowledge of it was confined to a single river and port, and it now extends from the Gulf of Tonquin to that of Pechili. The Yang-tse, the greatest river of Asia, and for navigation second only to the Mississippi—superior even to it for irrigation—has been ascended for 1800 miles; while at the distance of 800 miles from its mouth a great and valuable commercial port has been established, with safe access to our numerous steamers. With this extended geographical knowledge our commerce has kept pace, the yearly value of our own trade with the Chinese empire being not less than 25,000,000*l.*, while that of our Indian empire and colonies is of at least equal amount. The extent of our connexion with China, and the progress which it has made since the formation of our Society, may be judged by the increase which has taken place in our consumption of the great Chinese staple, tea, which amounted annually, thirty-five years ago, to 30,000,000 lbs., and last year to 92,000,000 lbs., or was, in other terms, more than trebled.

Amongst the most distinguished of those who by scientific surveys have contributed of late years to enlarge our geographical knowledge of China may be mentioned the names of Admiral Collinson, Captain Sherard Osborn, and our Medallist Major Blakiston, who extended our acquaintance with the great Yang-tze-Kiang to a distance of 1800 miles above its mouth; while the manners, customs, and statistics of China—no less a part of geography—have been illustrated by Fortune, Laurence Oliphant, and Michie.

In the Malayan Archipelago our political influence extends to but a small portion of its northern part, but in this geographical knowledge has been greatly improved. Among our countrymen, the principal contributors to it in this quarter who have followed our distinguished Vice-President Mr. John Crawford, have been Sir Edward Belcher, Sir James Brooke, Mr. Robert Logan, Mr. St. John, Mr. Windsor Earl, and Mr. Alfred Wallace. Through the labours of these zealous and intelligent inquirers, the Malay peninsula, the great island of Sumatra, and the huge one of Borneo, are far better known to us than they were to the founders of our Society. The value of our intercourse with these countries may be judged by the amount of the commerce we carry on at three small emporia, lying on the Straits which separate the southern peninsula of Asia from the island of Sumatra, and which last year amounted to 15,000,000*l*.

By far the greater portion of the Malay Archipelago, however, is either in possession of or subject to the influence and control of the Government of the Netherlands; and it is but bare justice to the Dutch to state that their active pursuit of geographical, geological, and other branches of scientific knowledge for the last fifty years has fully redeemed the short-comings of the preceding centuries.

Yet, with all these advances, much indeed remains to be accomplished, and to these and other desiderata I will advert in concluding this Address.

Russia and her Boundaries.—Among the great advances made by Russian geographers and travellers, I have adverted particularly in my previous Addresses, from as far back as the year 1857, to the researches of M. Radde in Eastern Siberia. I now learn from the *Compte Rendu* of the Imperial Geographical Society, prepared by its Secretary, M. Besobrasoff, that the second volume of the condensed work of M. Radde has appeared, in which the author describes in detail great part of the countries along the frontier between Eastern Siberia and China. Commencing with the eastern end of the Sayan Mountains, which, lying to the south-west of Irkutsk, constitute the separation between the two empires, M. Radde particularly dwells on the lofty, snow-capped, glacial mountain of Mungo Sardyk, surrounded by nomadic tribes, and rising to the height of 11,000 French feet above the sea. This grand mountain had never before been properly explored, having escaped the notice of both Humboldt and Ritter, though, as the culminating point of the Sayan chain, and lying immediately to the

north of the vast Chinese Lake of Kossogol, it is the key of the whole of that lofty region, and forms an admirable line of national demarcation. M. Radde indicates clearly all the routes through these mountains, by which the Chinese and Russians exchange commodities, the latter passing from the frontier-post of Changuinsk. The people living on the south side, who keep up the trade, are the Darkhates and the Urianks, tributaries to China, and probably unknown to all Englishmen. They inhabit the sides of the vast Lake of Kossogol, which extends from the Sayan chain on the north to nearly due south, for a distance of 200 miles. These people, who are Buddhists, and live on the plateau of Kossogol, at 5600 feet above the level of the sea, are entirely distinct in manners, habits, language, and religion from the Russians of Eastern Siberia. They are in fact of the same race of great herdsmen and horsemen as those of the vast regions of Mongolia, so well described by our deceased associate the traveller Atkinson.*

It appears, from what M. Radde has already written (his third volume will only be completed this year), that he embraces every Natural History subject, besides the sciences of Geography and Ethnology; and it is earnestly to be hoped that this admirable work may be translated into English or French; for, already, Dr. Petermann, in his 'Mittheilungen,' has given us a foretaste of much that we may expect from this rich source of fresh knowledge.

And here, in reference to the boundary between Russia and China in the environs of Kossogol, it is well to be reminded that a hundred years ago the Urianks of the Lake Kossogol were not (as they are now) tributary to China, and that at that time the Russians had an "ostrog," or advanced post, considerably beyond their present frontier. At present, an intermediate space, occupied by nomades, intervenes between the Russian posts on the north and the Chinese on the south.

Whilst on this topic of Russian frontiers, I must be allowed to direct your attention to a partial change recently made along the Russian frontier, between their former line and the Khanat of Khokand, inasmuch as I am desirous of showing that the alarm taken by a few of our countrymen only, particularly those who conduct the press in India, in relation to this step, is entirely groundless. A simple statement of the facts, and of the great distance which separates any portion of the new Russian boundary line from the

* It is here to be noted, that if any member of our Alpine Club should wish to explore the glacier of Mungo Sardyck, he should know that the mountain can only be ascended from the southern, or Chinese side.

nearest part of British India, or rather from Cashmere our tributary ought to calm these untoward forebodings.

Let it be borne in mind that, long before England had any establishments in the East Indies, the Russian Czars traded with China and the great Khanats of Bukhara and Samarkand. Caravans have been passing from time immemorial through the nomade Kirghis tribes, which have long been subordinate to Russia. Of late years, however, this intercourse has been much interfered with by parties of warlike and plundering Khokandians, who, passing from the mountains, pillaged caravans, as well as the Kirghis people, along that portion of the Russian frontier which lies between Fort Perovski on the River Syr Daria (anciently Jaxartes) and the great Lake Issikul, which extends to the Chinese frontier. Resolving to punish these atrocities, the Governor of Orenburg caused the frontier of the Cossack stations to be advanced from the sterile tract where the troops could not be maintained, to a more fertile tract, including the town of Tchemkend, which was conquered, and where corn and grass are in sufficient abundance to sustain a new line of Cossack posts between their post of Fort Perovski on the Syr Daria and the Lake of Issyk-Kul. This act is similar to the proceedings of our own Indian Governments, past and present, in reference to any lawless pillagers on our own frontier; but respecting it there have been great exaggerations. The new Russian boundary, after crossing the River Ili, runs in a southerly direction towards the source of that stream, locally called Tekes, and thence along the ridge of the lofty Thian Chan mountains. But whilst the Russians have no forts along this advanced line, the Black Kirghis, who inhabit the tract, have definitively recognised the rule of Russia.*

That which I particularly wish to eradicate from the minds of my countrymen, who only look at maps of Asia on the scale of perhaps 100 miles to an inch, is the absurd idea that, operating from this, the most barren, thinly-peopled, and most remote portion of all his vast empire, the Emperor of Russia has really any design upon British India!

Even were it possible, which from my acquaintance with the

* The above account of the exact line of the Russian boundary in this part of Central Asia is derived from M. Semenoff, of St. Petersburg, who, having explored this very country, is now bringing out a map of it. This description, which I owe to the obliging inquiry of Mr. Thomas Michell of the British Embassy in Russia, differs in some respects from that which was printed in the private copies of my Address, derived from a less accurate map. The new line is correctly given in the map of the instructive work entitled 'The Russians in Central Asia,' translated by the brothers J. and R. Michell.

steppes of the Kirghis I utterly deny, to move a large organised army across the deserts of the Oxus, to those portions of China with which the Russian people have long traded, it may be positively asserted that the invasion of British India, from any portion of this new Russian line to Western China, occupied by a few Cossack posts only, is a pure chimera, if not a physical impossibility. Not only is every part of the new Russian frontier separated from the nearest point of our tributary Cashmere by a space of at least 500 miles in breadth, but in that space there occur lofty, ice-clad, impassable mountains, the Thian Chan of Humboldt, which, ranging into the Mustagh and Karakoram chains, constitute the western limbs of the mighty Himalayas. Never, therefore, was there so purely baseless and visionary an apprehension of a Russian invasion of India, as this which has been raised simply upon the taking up of a partially new line of frontier, which our allies, in protecting their own tributaries, had a perfect right to establish in order to keep up their ancient communication with China, in the western extremity of which, at Kashgar, the site of Adolph Schlagintweit's murder, they have been allowed by the treaty of Peking to establish a Consul.

After this digression, which I have made in the sincere desire to aid in thoroughly re-establishing the kindly relations which happily existed for centuries between Russia and England, and of which I have experienced in my own person so many proofs, I revert to pure Geography.

Let me then inform you that, besides the admirable work of M. Radde, the Geographical Society of St. Petersburg has announced the publication of a petrographical map of the arrondissement of Minougsinsk, by Professor Grewinck of Dorpat, a map of the southern part of Eastern Siberia, and the Chinese boundary in those meridians, embracing the whole riverine system of the Amur and its tributaries, the southern half of the basins of the great streams, the Lena and the Yeneissei, and also of the large island of Sakhaline, on the small and general scale of 40 versts to the inch. Besides this, there is a smaller map of the same regions, on the scale of 160 versts to an inch. Again, the historical sketch (in German) of the great Siberian expedition by M. Schmidt, of whose important geological and botanical contributions I have formerly spoken, will soon be illustrated by a geological map of the southern portion of Eastern Siberia, another map of the basins of the rivers Amur and Bureia, and a third of the island of Sak-

haline, the physico-geographical description of which is supplied by M. Glehne.

When we look back to the condition of the geography of Russia in the year 1840, when I first visited that country, and consider its present advanced state, we may truly say, that the strides made in the quarter of a century which has elapsed are most surprising. At that time there was not even a reliable map of Russia in Europe; and though there were in the War-Office military sketch-maps of the distant frontiers, how different were these from the exact maps and descriptions which have been since obtained and worked out by the labours of a Geographical Society founded on the model of our own! At that time no railroad had been commenced, and now such lines of communication are in the course of extension over wide tracts of European Russia. Nay, more, the electric telegraph is about to be carried on the one hand across Eastern Siberia and Mongolia to Pekin, and on the other from the mouth of the great River Amur northwards along the shore of the Sea of Okutsk, passing by Kamschatka to Behring Straits, across which there will be no difficulty in establishing a submarine cable. Thence, traversing Russian North America and running along the shores of British Columbia, this gigantic line will terminate in California and the United States.

It remains to be proved whether the inhospitable and intensely cold regions through which the last-mentioned electric wire is to be carried, may not oppose serious obstacles to the establishment of such a line of telegraphy; but, if not, the submarine distance to be traversed is so short that it is probable the communication with America may be more rapidly made by land, notwithstanding the great distance, than by crossing directly under the wide Atlantic, should the great submarine Atlantic cable be, as we all hope, successfully laid.

In relation to another frontier country of Russia, a stop had been put to the regular intercourse between her main dominions and Georgia by the fall of an enormous mass of broken rocks and ice, proceeding from the glacier of Devdorak, which lies along the flank of the lofty Kasbeck Mountain high above the valley of the Terek. It is by this defile that the only great military road passes, and at previous periods similar *éboulemens* have occurred in this locality. It is estimated that the present fallen mass of broken materials has a bulk of nine millions of cubic feet; and by it the course of the river Terek has been dried up even to Vladikau-

kase, for a distance of forty versts. As it will take two years to melt the fallen blocks of ice, and to remove the stones which encumber the great road, traffic is now with difficulty carried on by paths on the side of the huge broken mass. It appears that between 1780 and 1830 there occurred six of these *eboulemens* at intervals of six to fifteen years, and that the last occurred in 1853.

This phenomenon is well worthy of the consideration of those who study the operations of glaciers, on which I dwell at some length in my last year's Address. For, it is essential to distinguish between an occasional downfall like this, which in a single day blocks up a whole valley with ice and stones, and the regular, silent, and slow advance of the moraine of a glacier. And yet the mass of *débris* of the one and the other may so resemble each other that, if the Caucasus were an unexplored region, the traveller who first passed by this valley of the Terek in a season after the fallen ice had melted, leaving the loose stones only, and saw the distant glacier of Devdorak far above him on his flank, might naturally have taken the huge piles of broken rocks around him for the moraine of a former period, produced by an old gigantic glacier that had since retreated to the Kasbeck Mountain.

I earnestly trust that some geologist will visit this gorge and report upon the phenomenon; it being of deep interest to ascertain if striations and groovings, similar to those produced by the slow advance of a glacier-moraine, have been imprinted on the surface of the rocks over which this portentous mass of broken ice and stones has so suddenly been hurled.

Even when concluding this Address, I have received another portion of the *Compte Rendu* of the Imperial Geographical Society, accompanied by a letter from its present accomplished Secretary, M. Osten Sacken, who has succeeded M. Besobrasoff. Ample details, he writes to me, have been given of an expedition which took place last summer, by which the River Sungari, a vast affluent of the mightier Amur, was ascended in a steamer by the astronomer Ussoltze, the interpreter Schichmare, and Prince Krapotkine. They ascended the river for twenty-one days, and having reached the city of Ghirin, in the heart of Mandchuria, spent twelve days in returning to the Amur. Ghirin, marked on most maps as Girin-Oola, is surrounded by a most fertile country, producing wheat, millet, maize, apples, peaches, and grapes, and is about 1056 versts above the mouth of the Sungari. Most of the intervening space is a country deprived of wood, and in which the inhabitants use

only reeds and small shrubs as firewood, though, at about 700 versts from its mouth, the river flows through mountains which are richly wooded. Along the lower part of the stream the population is comparatively insignificant, with the exception of a town of considerable barter and commerce, called San-Sing. The navigation of this noble stream presents no obstacles, and the inhabitants on its borders carry on a brisk commerce, and were very friendly to the travellers. Above Petunhootan, the passage of vessels to Ghirin can only be effected during seasons of floods. I quote this as one of the most interesting and important among the numerous explorations of the Imperial Geographers, as it opens out a country scarcely before visited except by a few French Jesuit missionaries, and must afford a fine field for the commercial enterprise of the inhabitants of Eastern Siberia.

The numerous important changes which have been made in the position of places and the contour of the vast countries of Eastern Siberia, and all that portion of Asiatic Russia which borders Mongolia and China, will soon appear in a general map, the numerous and laborious researches on which it is founded being mentioned in the *Compte Rendu* of the Imperial Geographical Society. Other highly important works in the great province of the Caucasus, and the results of surveys around and soundings in the Caspian Sea are also enumerated.

South America.—Great advances have been made towards a correct geographical knowledge of South America since the labours of the Society commenced (1830). At that time the coasts were inaccurately laid down, the courses of some great rivers, notably the Beni, were merely guessed at on existing maps, and those of others, besides vast tracts of country, were entirely unvisited. Much has since been effected through the labours of Fellows of this Society and other explorers, yet very much remains to be done.

The admirable surveys of King and FitzRoy, carried out chiefly by the last-named, were commenced in 1826, and during ten years of arduous and zealous work the coast of South America, from the River Plate to the Guayaquil River, was accurately laid down, including the Straits of Magellan and the intricate channels and archipelagos to the westward. This work was most truly described by the late Mr. W. R. Hamilton (then President of this Society, in his annual Address of 1839,) as without parallel in the annals of maritime surveying, and as one which thenceforth would inseparably connect

the names of Humboldt and FitzRoy as the chief authorities on the geography of South America. The Sailing Directions of the lamented Admiral FitzRoy are still, indeed, the sole guide for the navigation of those coasts. That able and high-minded officer who, as I have before said, spent a large sum out of his private fortune (for which he was never remunerated) in completing the survey, also fixed the height of Aconcagua, one of the principal peaks of the Andes. And here I must remind you of what I have already said in the Obituary regarding the light which was thrown upon Physical Geography, Natural History, and Geology, by the companion of FitzRoy, our eminent Associate Charles Darwin, whose works, mainly founded on observations in South America, form quite an epoch in the literature of scientific travel.

When the Society was formed, Sir Woodbine Parish and Mr. Pentland were already at work in South America. To the former we are indebted for many valuable communications, and there are few who have worked so zealously in collecting geographical information for the use of his countrymen. On his return to England he joined our Society with a vast mass of geographical materials, collected during a long residence in the La Plata provinces, to which he had been sent originally by Mr. Canning to obtain information for the guidance of our Government. Let me also say that of the many Associates I have met with at different periods in our Council, no one contributed more assiduously and successfully to the rise and progress of the Society than Sir Woodbine Parish. In the same Address of Mr. Hamilton, mentioned above, you will find a very full enumeration of the authorities for the maps of South America which Mr. Arrowsmith then undertook to construct for the account of the voyage of the *Beagle* and for Sir Woodbine Parish's own work, published about the same time. Mr. Pentland, who was also sent out by the same enlightened minister, Canning, surveyed the shores of Lake Titicaca, fixed the positions of forty stations astronomically between that interesting point and Cuzco, and contributed to our Journal a most valuable paper on the Bolivian Andes.

The attention of our Society was very early turned to South American discovery, and one of our first acts was to grant a sum of 900*l.* for the exploration of the interior of British Guiana, by Sir Robert Schomburgk. The valuable labours of that indefatigable traveller extended over a period of more than eight years, commencing from 1835. He ascended the Rivers Corentyn, Berbice,

and Essequibo to their sources, explored the interior chains of mountains in Guiana, and struck across to the Orinoco, thus connecting his positions with those of Humboldt. That great traveller was stopped at San Carlos on the Rio Negro, but Schomburgk descended the mighty affluent of the Amazon to its junction with the Rio Branco, and returned to Guiana by ascending the latter stream. During this remarkable journey he made a survey of an extensive and previously unknown region.

When Schomburgk was commencing his discoveries in Guiana, Smyth, in 1835, started from the Andes, explored part of the courses of the Rivers Huallaga and Ucayali, crossed the Pampa del Sacramento, and was the second English geographer who descended the mighty Amazon. He fixed several positions astronomically, and made valuable contributions towards a more correct knowledge of the course of that queen of rivers. In this field of research he has had several worthy successors. Wallace explored the course of the Rio Negro and the previously unknown Uaupés; Spruce surveyed the Trombetas and two tributaries of the Cassiquiare, and ascended the almost unknown Bombonaza; and Bates devoted several years to an examination of the main stream of the Amazon as far as St. Paulo, near the frontier of Peru. These observant and intrepid explorers have contributed most important additions to our still very imperfect knowledge of the grandest river-system in the world.

Meanwhile a vast region was virtually unknown on the eastern slopes of the Andes, and indeed on the plateaux themselves, and much still remains to be explored. But slight progress has been made by geographers in this direction. That gallant soldier and enlightened statesman, General Miller, explored a tract of country to the eastward of Cuzco in 1835, into which no Spaniard had ever penetrated. Markham, in 1853, followed in his footsteps, and traced the courses of some additional sources of the Purus, a great affluent of the Amazon; and in 1860 he explored the unknown southern part of the Peruvian province of Carabaya. In 1853 Colonel Lloyd traced the course of the River Chimore, a tributary of the Madeira; and Dr. Jameson, of Quito, in 1861, descended the River Napo. Of late years Mr. David Forbes, the brother of the eminent naturalist, Edward Forbes, and himself a skilful mineralogist, has done valuable work in the Bolivian Andes, particularly in rectifying certain errata of the late M. D'Orbigny in the general classification of the rock formation extending from Peru to Chili, and in showing that the highest mountains in the chain were composed of slaty

Silurian rocks. Recently he has also penetrated for some distance into the little-known region solely occupied by Indians to the east of the Bolivian Andes.

In the Argentine Republic, and in Chile, English travellers have laboured with some effect in the wide and interesting field first opened out by Sir Woodbine Parish. The undertakings of that untiring and liberal explorer, Mr. Wheelwright, and his surveys of passes in the Chilian Andes, have been as welcome to geography as to commercial enterprise. Mr. Mansfield's charming account of the Gran Chacu drew attention to another region as yet inadequately explored; while the scientific labours of Captain Sullivan, and the journeys of Mr. Hinchcliffe, Consul Hutchinson, and Mr. Hadfield (now the editor of the 'Brazil and River Plate Mail,' a journal which diffuses much new geographical information), have increased our knowledge of the River Plate and its affluents. The latest researches of Hutchinson have been in the valley of the Salado, an important branch of the Paraná, in which he has been aided by the enterprising engineer, Mr. Coghlan, one of our Fellows. One of our Foreign Honorary Members, Professor Burmeister, of Buenos Ayres, has added much also to our knowledge of the interior of the Argentine Republic, both in his Book of Travels through the La Plata States, and his improved map of the same region. Whilst I am engaged in writing this Address, Captain Parish, R.N., the son of Sir Woodbine, who has just returned to England, after a journey of 1000 miles up the Paraguay, has brought a copy of a new edition of this map for presentation to our Society, on which are numerous manuscript notes, containing the latest information regarding the interior of this great region. For an account of the researches of M. de Moussy and of M. Demersay's important works on these same countries, I must refer you to my Address of 1861.

On the west coast of South America Admiral Kellett continued the survey from the Guayaquil River to Panamá; and one or two portions of the Peruvian coast have been explored by English geographers. Thus Markham has examined and described the valleys and deserts from Lima to Nasca; Spruce has given a most complete and valuable account of the valleys of Piura and Amotape; and Bollaert has collected much geographical information respecting the province of Tarapaca and its inexhaustible mineral wealth.

In this hasty sketch it has merely been my intention to point out the labours of English explorers in South America since the foundation of the Royal Geographical Society; but it would not be right

to omit the equally valuable results of the travels of Frenchmen, Italians, Germans, and Americans; while the praiseworthy exertions of native geographers call for special notice. Martius, Poeppig and Tardy de Montravel on the Amazon; Castelnau in Brazil, Peru, and on the Ucayali; the officers of the great French Survey of the coast of Brazil; Herndon and Gibbon on the Amazon; Gay, Gilliss, Domeyko, Plessis, Allan Campbell, Moesta, and Cox, in Chile; D'Orbigny in Bolivia; Codazzi in Venezuela and New Granada; Von Tschudi in Peru; and Page, and De Moussy, in the Argentine Republic, have, by their indefatigable explorations, added most important material to our knowledge of South American geography.

But the natives of South America themselves have not been idle, and, considering the great difficulties they have had to contend against, the sons of those interesting and still struggling young Republics have done good service to our science. In New Granada the learned Colonel Acosta, by the construction of a valuable map, has followed worthily in the footsteps of his great countryman Caldas. I also learn from himself that General Mosquera, who has twice served as President of the United States of Columbia, and who is now the representative of those States at the British Court, is engaged with others in bringing out a great work on the geography, history, and statistics of his native country, formerly New Granada. In Ecuador the work and map of Villavicencio show that the sons of the Equator are not neglecting geography. In Peru the explorations of Raimondi and the work and map of Paz Soldan form valuable contributions to our knowledge of that country. In Bolivia a complete map of the republic has been constructed by Ondarza. The Chilean Government has initiated several exploring expeditions, and our Foreign Corresponding Member, Professor Philippi, has examined the desert of Atacama under its auspices. In the empire of Brazil surveys have been conducted under the enlightened patronage and superintendence of the present Emperor, who has graciously accepted the post of one of our Honorary Members. Several South American geographers are now Corresponding Members of the Society, and we may confidently look forward to active co-operation from them in increasing our geographical knowledge of that great continent in future years.

Africa.—Any recapitulation, however brief, of all the researches made upon this great Continent, since the foundation of the Geographical Society, would swell this Address to an inordinate length;

for, in every one of the thirty-four volumes of our Journal, there are memoirs upon parts of Africa. Having in the last year's Address endeavoured to comment upon the last advances which had been made, I have on this occasion but few observations to offer upon the achievements of the past year. In truth, whilst Baker is in the heart of the country, von der Decken just starting from Zanzibar upon his self-imposed and costly endeavour to penetrate into the interior by ascending the Jub, or some adjacent river, and Du Chaillu advancing on the same parallel from the west, our great explorer Livingstone is still among us, preparing for a new and most extensive journey in Eastern Africa. I have, therefore, to dwell only upon my hopes and aspirations.

At the last Anniversary I informed you that the Council had drawn up a memorandum, in which, after enumerating the desiderata of such an expedition, a hearty willingness was expressed to embark 1000*l.* in aiding such an examination of the White Nile as would lead to a commercial intercourse between Egypt and the countries of the Equatorial kings visited by Speke and Grant. Such an expedition would, it was conceived, tend also to put an end to much lawless and cruel conduct of slave-traders on the banks of the great stream. Thus every Geographer desired to see this vast river, which, for a distance of 1600 miles above the cataracts, has now, thanks to the Dutch ladies and Miss Tinné, been proved to be open to steam-navigation, rendered available in the improvement of the people, and the advancement of civilisation and commerce. Alas! I regret to say that this scheme, cherished by merchants and philanthropists, as well as by geographers, does not at present seem likely to succeed, owing chiefly to political causes. Though postponed, let us, however, hope that the day is not very distant when the White Nile will, with the capabilities of which we have now become acquainted for the first time in all history, be rendered of real use to commerce and civilisation; and, at all events, let it be on record that this Society made the first move in so righteous a cause.

But, if this project be suspended, there is another about to be carried out, which as regards Geography is of still higher importance, and must also be of great value to the natives of Eastern Africa. After all that has been accomplished by Burton, Speke, and Grant, and with the additions to our knowledge now being made by Baker, Von der Decken, and Du Chaillu, we may hope that, in the wide tracts around and north of the Equator, the water-system of Africa

will ere long be much better known. As, however, the very large region lying between the southern extremity of the Tanganyika of Burton and Speke, and the northern end of the Nyassa of Livingstone, has never been traversed by any European, and has only been imperfectly described by natives, the Council of our Society has rejoiced in engaging Dr. Livingstone once more to revisit South-eastern Africa, and determine the hidden watershed of that vast country.

Refreshed and invigorated by his home-visit, during which he has prepared and is about to publish an admirable sketch of his last adventures, to which I will afterwards allude, my eminent friend at once accepted our invitation; and, on an application being made, Earl Russell, in supporting this geographical effort, has, happily, connected it with the public interests, by appointing Dr. Livingstone to be H.M. Consul in the interior of Africa; for as such he is accredited to all the chiefs and rulers, with the exception of those countries which are subject to the King of Portugal, the King of Abyssinia, and the Pasha of Egypt. Whilst the Government and the Geographical Society unite in aiding this expedition, it is not to be passed over without the expression of our gratitude, that Mr. Young, one of Livingstone's old friends, should have advanced 1000*l.* in furtherance of this great cause. Nor are we to forget that Livingstone himself is about to throw into the adventure the steambot the *Lady Nyassa*, which he left at Bombay, and which, with a noble resolution to check the slave-trade, he built at his own expense, because the steamer sent out by the Government drew too much water for the navigation of the Shiré; by which alone he hoped the transport of slaves from the interior might be prevented. Whether, after proceeding *viâ* Bombay to Zanzibar, he will penetrate the continent by ascending the Rovuma, as he has already done, or at some point northward of it; either route being entirely to the north of the Portuguese boundary, there can be little doubt that he will solve the problem of the true course of the waters between his own Nyassa and the Tanganyika of Burton and Speke. And if, on reaching the latter inland sea, he should, after accurately fixing its altitude, ascertain whether any great river flows from it to the west,—and still more if he can further determine the disputed question of whether any waters do or do not escape from its north end to feed the White Nile,—he will have so added to his grand previous labours as to have won a first place among the African travellers of this age and of all former periods.

Whilst von der Decken is entering East Africa just south of the Equator, Du Chaillu has boldly started on the same parallel to reach the interior from his old station on the River Fernand Vaz, south of Cape Lopez. The self-reliance and courage of this explorer cannot be too much admired, for he is now travelling quite alone, and assisted only by a few natives from the coast, who are to continue with him. He is wending his way without a single friend or European companion, and trusting for the transport of his large stock of goods, provisions, medicines, together with philosophical and photographic instruments, to the various tribes he may meet with. Knowing, as I do, that these preparations have been accomplished by spending all the little fortune acquired by the sale of his first book, I cannot sufficiently admire the energy of my absent friend, and his entire devotion to the cause of African travel. In his last letter to me, written on the point of departure from the coast, he begged me not to be uneasy about him for a year or two; for, whether he may or may not discover the sources or upper affluents of any of the west-flowing streams, he is imbued with the idea that from the same region some great affluents of the Nile, such as the Luta Nzige, may also flow, and, if so, he hopes to descend their streams, and reappear in the civilised world by reaching and passing down the Nile itself. Let me here say that nothing can better testify to the honest ambition of Du Chaillu to be serviceable to every branch of Science, than that, during his stay at Fernand Vaz, where he was detained till he could receive a renewed supply of those instruments which were lost when he disembarked, he has contrived to send home to the British Museum a vast number of well-selected objects of Natural History, which, on the authority of Professor Owen and Mr. J. E. Gray, I have to announce are of the highest value. As M. Du Chaillu has rendered himself a photographer, as well as an astronomical observer—advantages he did not possess in his first journey—we are sure, if his life be spared, to reap a rich harvest on his return; and so let us wish him God-speed by the way! In boldness of conception nothing in the annals of African research has surpassed his present project.

Turning from the Southern and Equatorial countries to North Africa, we have had great satisfaction in witnessing how much original work has been accomplished by the travels of Gerhard Rohlfs, a native of Bremen, towards the expenses of whose journey our Society contributed 50*l.* At very small cost, and in a comparatively brief period, this zealous young German has penetrated the

interior of Africa from the side of Marocco as far as the oasis of Tuat, and thence crossing the Great Atlas, reached Tripoli by way of Ghadames. He has now, after a brief visit to his native land, and consigning his journals to Dr. Petermann, to be published in the 'Geographische Mittheilungen,' again proceeded to Tripoli, with a view to another journey across the Sahara, during which he hopes to penetrate as far as Timbuctu.

New Publications.—Having been unable, owing to many duties, to read and digest the contents of various works bearing upon geographical science which have appeared during the last year, I will now only refer to four publications, which have deeply interested me. The first of these works, in reference to date, is that of the ardent and observant Hungarian traveller, M. Vámbéry, who, at our last meeting of the past summer, gave us the first sketch of his travels through Central Asia, in the character of a Mahomedan Dervish. No person, who was then present, can forget the effect he produced upon us when he related his racy and lively story, and explained to us the obstacles he had to overcome in traversing the Khannats of Khiva and Bukhara to Samarkand.* Sir Henry Rawlinson, who has so intimate an acquaintance with Asiatics, when speaking in praise of these adventures of Vámbéry, justly told you † that there was not one European in a thousand (I would almost say in ten thousand) who could successfully pass as a holy man through three years of probation among bigoted Mahomedans. The materials he had collected, and which were then only briefly alluded to, have since been formed into a highly interesting and attractive volume; and I earnestly hope for the honour of my countrymen that this work will have a much larger sale than it has yet met with. We must ever recollect that M. Vámbéry went through the appalling difficulties and dangers, which beset his toilsome path, from a pure love of the science of language, and in the hope of tracing the root of his native Magyar tongue. Since he came among us he has so endeared himself to us, by his agreeable conversation, and has so charmed many a society with his

* At that meeting justice was not done to the Description of Samarkand made by the Russian Expedition, consisting of MM. Khanikof, Lehmann, and some officers of the Imperial School of Mines, who went thither in 1841, at the invitation of the Khan, to search for valuable mines and ores. This work was translated into English by Baron de Bode, and is in the British Museum. All this was explained at the Bath Meeting of the British Association, at which I stated that I was myself at Orenburg in 1841, when this Expedition went to Bukhara and Samarkand.

† Proceedings, Vol. viii. No. 6.

sparkling anecdotes, that we are no longer surprised that he could pass unscathed through the deserts of the Oxus, or obtain the marked notice of a great Khan amid the palaces of Samarkand. Justly, therefore, has the Council acted in awarding a recompence to this bold traveller, who, as I have already said, might have obtained a Gold Medal at my hands, if, as a holy Dervish, he had not been interdicted from practising what would be considered the "black art" among Mahomedans—the taking of any of those observations which Geographers require.

The *Travels and Researches in the Island of Crete*, by Captain T. A. B. Spratt, R.N., is a work which will rivet the attention and enrich the minds of various readers, whether they be antiquaries and scholars, or geographers and men of other sciences. Well may I have spoken elsewhere in this Address, of that highly-instructed branch of the Royal Navy, the Surveyors; for here we see produced by one of them a masterly illustration of the physical geography, geology, archæology, natural history, and scenery of the diversified island of Crete. In his accurate nautical chart, giving the outlines of the land, and the soundings around this broken and deeply-indented island, as seen in the geological maps published in these volumes, the author clearly sustains, by data exposed along the shores of Crete, the law laid down by De Saussure on the southern side of the maritime Alps, that the highest and steepest parts of a coast are always flanked by the deepest waters. Detailing the geological structure of the island, from the older rocks which rise to the summit of Mount Ida to the most recent deposits on the sea-shore, Captain Spratt adduces physical evidences to prove that considerable elevations of the island, as seen in many places, have taken place within the historic period. This is demonstrated by the marks of the old sea-level, made when the sea covered the ancient port of Phalasarna, which has been raised up and constitutes dry land. In this way the importance of geological knowledge to guide archæologists is demonstrated; for our associate explains to us the changed form and outlines of old ports and cities, in a way which his predecessors, however learned, could not have applied, for want of geological knowledge. This work must indeed be warmly welcomed by all comparative geographers; and if that great scholar, our deceased associate Leake, were still among us, he would be the first to eulogise it.

When we consider the severe nautical duties which have been performed by Captain Spratt, and know that he is the officer, who,

called away from peaceful, scientific efforts, so distinguished himself afterwards in the late war, by boldly and accurately determining the soundings along the coasts of the Crimea, and under the enemy's batteries at Kinburn, thus leading in our fleet to act with effect, we cannot too much admire the many fine qualities which are combined in this gallant seaman. Let me say, as a geologist, that no portion of these most interesting volumes has more sincerely gratified me, than the manner in which the author enunciates and identifies himself with the views and observations of that profound naturalist Edward Forbes, who was for some time his companion. We must never forget, that, without the deep-sea soundings and dredgings conducted by Captain Spratt, we should never have obtained the grand views of Edward Forbes on the submarine zones inhabited by different classes of animals, which established an entirely new phase in the inductive reasoning of geologists, who, after all, are but physical geographers * of former conditions of the earth's surface.

Another work to which I specially invite your attention (and I have already alluded to it in my observations upon Africa), is one about to be issued by Dr. Livingstone, under the title of 'The Zambesi and its Tributaries,' and to the pages of which I have had access. Suppressing as much as possible the details of travel, and condensing into a single volume a narrative of his labours since we wished him God speed at our great festival in 1858, and of his method of overcoming the many difficulties he had to encounter, he indicates how, by ascending the Shiré, that great affluent of the Zambesi, he made, what I have no hesitation in saying, was the greatest and most praiseworthy effort ever attempted to stop the slave-trade in the interior of Africa. Thus, the great and important fact which is recorded in this book is, that the author was the first person who really tracked the slave-trade of Eastern Africa to its central source. He next successfully showed that as his own great Lake Nyassa, and its affluent the Shiré, have for 400 miles in the interior, a direction from north to south, or parallel to the coast, so a small steamer, being established on these inland waters, might effectually protect all the central and western regions from the devastation and cruel forays of the Arab traders, to which they are now exposed. Then, how can we too much commend the warm-hearted and zealous Consul, who, finding that a smaller

* See my Address of last year, Journal, Vol. xxxiii., in which Captain Spratt's Mediterranean Surveys are specially alluded to.

steamer than the Government had provided him with could alone effect this great good, ordered, at his own expense, the *Lady Nyassa* to be constructed. I have dwelt before now with deep interest on the unceasing efforts he made to have this vessel transported over the long Murchison Cataracts, extending northwards from the Zambesi; and assuredly if the territory had been adjacent to one of our colonies, or subject to British influence, the original scheme of my eminent friend, of nipping the slave-trade in the bud, would have been completely successful.

In this volume, besides narrating the political obstacles opposed to his efforts, Livingstone describes the capacity for transport in the Zambesi,* Shiré, and Rovuma rivers, the capabilities of the soil, the nature of the climate, with graphic sketches of the habits of the people over wide and varied tracts. When it is stated, that the volume also embraces clear and well-penned descriptions by his brother, Charles Livingstone, and contains some of the observations made by the accomplished naturalist of the expedition, Dr. Kirk, besides numerous geological and geographical data accumulated on the banks of the Zambesi by the lamented young Richard Thornton, enough is said to ensure for the work a welcome and grateful reception by the public.

A very original work, and, what is uncommon in such subjects, a very lively and attractive one, has just appeared under the striking title of 'Frost and Fire;' † which under the first of these names affords, by numerous illustrations, a strong support to my own glacial creed.

Nearly thirty years have elapsed since I expressed my belief as a geologist, that large portions of Britain were under the sea during a former glacial period when great icebergs, moved by dominant Arctic currents, carried great blocks and the Northern drift, lodging them at different altitudes on the sea-bottom of a sea, one portion of which flowed through the ancient channel to which I gave the prehistoric name of the Straits of Malvern.‡ I also then believed that, exclusive of the countries in which it could be shown that land-glaciers had existed or now exist, and where unquestionably they had produced and are producing, striæ upon the surface of the rocks

* A good idea of the grandeur of the Zambesi scenery and the Great Victoria Falls, may be obtained by inspecting a model of the Falls and their neighbourhood, now at the Rooms of the Society, constructed by Mr. Thomas Baines, formerly Artist to the Livingstone Expedition.

† By Mr. John F. Campbell of Islay.

‡ See the 'Silurian System,' written in 1836, and published in 1838, p. 522.

over which those bodies of ice descend, similar markings and polishings must have been produced on a still wider and more extensive scale when huge icebergs, floating away from terrestrial glaciers to great distances, were arrested as they passed over lands which were submarine, and grated along the then bottom of the ocean. This view was subsequently extended in some detail by observations which I made in Scandinavia, Russia, and Northern Germany,* and in last year's Address I endeavoured to prove that, as regards the striation and polishing of rock surfaces and the translation of large erratic blocks, precisely similar effects had resulted from the marine transport of ice, as by terrestrial glaciers.

But to return to 'Frost and Fire.' Passing by the author's graphic descriptions by pen and pencil of the different effects produced in juxta-position in Iceland, where the accretions to the surface by volcanic action and the power of repressed steam in upheaving the land are in such fine contrast to the effects of denudation, I will now advert only to the icy branch of the great subject handled by Mr. John Campbell.

The main points of the glacial theory which he puts forward are shortly these.—As the Arctic current now flows from north-east to south-west, for reasons which he illustrates by various ingenious diagrams and contrivances, and as it now passes from Spitzbergen to Cape Farewell, and thence along the coasts of Labrador and Newfoundland, into the Atlantic, carrying heavy icebergs to lat. 36° 10' and scraping rocks with them while lifting and dropping stones by the advance of coast-ice, so, as he argues, former Arctic currents bearing heavy ice-floats must have flowed from north-east to south-west, ever since the general climate of the world and distribution of sea near the poles were in anything like their present conditions.

As a glacial period now exists in Greenland, so a glacial period, he thinks, existed in Scandinavia and in Britain, when portions only of those lands were above water, and while the sea was open to an Arctic current. He tries to prove that such Arctic current laden with ice flowed over Lapland, down the Baltic, and over the British Isles † at a comparatively late period; and he argues that the glacial period in Britain probably ended when certain lands had so risen as to turn the cold stream with its climate westward, and so transfer

* See 'Russia in Europe and the Ural Mountains,' vol. i. pp. 507-557.

† If the author had read 'Russia and the Ural Mountains,' he would not have failed to recognise how my colleagues and myself had shown that the northern glacial drift covered all Northern Russia in Europe and Northern Germany.

the glacial period of Scandinavia to Greenland. He endeavours to show in detail that striæ better preserved than many sculptures of the historic period, exist on the tops of isolated hills 2000 feet high, in Connemara, Ireland, and on watersheds and passes in Wales, Scotland, Scandinavia, Lapland, and in America, and that these high marks have directions which support his theory. He has taken rubbings from these rocks, one of which is given on the binding of his book. The author imagines that water would move as air moves, and for the same reasons; and that denudation by ocean-currents ought to give a definite pattern, carved by these tools on rocks. Trees bent by prevailing winds have similar bearings in wide districts on both sides of the Atlantic; and so have many large systems of mountains and hollows which are attributed to denudation. He thinks that ocean-currents and climates similar to those which now exist, but differing in position, are sufficient to account for some ice-marks which no ordinary glacier could possibly have made, namely, striæ running horizontally along hill-sides, and over high points, as they do in Ireland and elsewhere. At the same time, he is fully acquainted with the effects of the action of glaciers on rocks, and illustrates his views by characteristic sketches: whilst, in citing numerous data in support of his view, he denies that existing rivers have *produced* great valleys or deep rock-basins; and thus his observations are quite in harmony with the conclusions given in my last year's 'Address.'

Visiting Labrador last summer, the author's views were strongly confirmed by what he there saw of the action of floating coast-ice; and in reference to the vast region of North America, he adopts the opinion I have long entertained, that the chief striation of its rocks and the distribution of northern blocks over so immense an area was produced when the country lay under the waters, rather than adopt what seems to me an extravagant hypothesis, that in former times a vast glacier extended from the North Pole to Georgia in the Southern division of the United States, or over much more than the half of the northern hemisphere; to say nothing of the non-existence of any lofty mountains on the north, from which such a monster glacier could have been propelled from north to south and have passed over higher lands in its southern progress. As many general readers will doubtless be gratified in perusing the telling anecdotes related by the author—whether derived from scenes in his own native Highlands, or from Lapland, Norway, the Alps, the Mediterranean, or North America—so I also believe that

geologists and physical geographers will find in the work 'Frost and Fire' a fund of original thought, which must act as a stimulus to the production of many most important results.

Conclusion.—Having now adverted to many of the leading geographical advances made by our countrymen since the origin of this Society, let me say that great as these steps have been, they still leave countless unvisited fields for the researches of ourselves and successors.

Thus, although a very large portion of Australia has in comparatively few years been more or less explored, yet we know that the spaces which lie between the routes taken by various travellers in the interior of that continent are of vast width, and that an enormous region entirely unknown separates the colonies of South and West Australia, whilst a large portion of the north coast, with its fine bays and headlands, has still to be surveyed and occupied.

In North America much stout work remains to occupy for many a year the most ardent explorers. For, although a great deal has been done by the enterprising travellers and geographers of the United States, and that the great territory of the Hudson Bay Company has been so much and so well examined since the days of Mackenzie, we have recently seen how a zealous young English nobleman and his companion* could bring to us fresh knowledge respecting the western side of the Rocky Mountains and a portion of British Columbia.

As to South America, we obtained proofs, even at our last meeting but one, of the imperfect acquaintance we possess of important parts of New Granada, now styled the United States of Columbia. Mr. Laurence Oliphant, indeed, recalled our attention to the often-disputed question as to the best and most feasible passage for ships or by rail across the Central American isthmus, and made us regret that in the very parallel where the Atlantic and Pacific approach nearest each other there, *i. e.* between the River Bayanos and Mandinga Bay, no European had traversed the intervening short space of 15 miles.† If we cast our eye on the map, and take the works of Humboldt and others in hand, we shall then see what great *lacunæ* have to be filled in on either side of the Andes, and what a prodigiously large portion of the interior of

* Viscount Milton and Dr. Cheadle; whose work, entitled 'The North-west Passage by Land,' is just about to appear. See also 'Proceedings,' vol. ix. p. 17.

† On this occasion General Mosquera, Minister of the United States of Columbia at our court, was present and addressed the Meeting.

Brazil, La Plata, and Patagonia, are still virgin fields. One of these desiderata is, I rejoice to say, about to be supplied, particularly as respects Natural History exploration. My eminent friend Professor Agassiz, at the head of a well-organised expedition sent forth by the city of Boston, and encouraged by our Honorary Member the enlightened Emperor of Brazil, is about to ascend the River Amazon and its upper tributary the Huallaga, and thence to cross the Andes to Lima. Returning to the cordillera and examining the environs of the lofty lake of Titicaca, Agassiz will recur to a line of research in which he was much distinguished in former years, and will endeavour to trace the lowest limits of the old glaciers of the Andes which he is led to believe must have existed in earlier times, but of which no traveller has as yet discovered a trace. Having satisfied himself on this point, he will return by following the course of the Madeira, a great affluent of the Amazon.

Looking to the wide spaces in the interior of Brazil, which are as yet occupied by a scattered population of Indians only, we may naturally expect that our enterprising Medallist Captain Burton, who is about to proceed to Santos as Her Majesty's Consul, may, under the patronage of the Emperor of Brazil, be enabled to gather for us many good additions to our present stock of knowledge respecting those extensive countries. In New Granada we want accurate descriptions of the cordilleras, while the great plains and mighty rivers to the eastward have not been traversed since the days of the searchers for El Dorado. The same may be said of Ecuador, Peru, and Bolivia. The Purus and other grand affluents of the Amazon are still practically unknown. In Southern Brazil, and especially in the Gran Chacu, wide tracts of country await exploration. In fact there are many thousands of square miles in South America that are almost as little known now as when the Spanish conquerors first landed in the New World.

If we turn to Asia, even that seat of the oldest civilisations presents to the eye of the geographer as many *terrae incognitæ* as Australia, Africa, and America.

In the huge empire of China and its dependencies what numerous journeys must yet be made to test the value of the recitals of Klaproth and other Chinese scholars respecting regions which have not been visited by Europeans since the days of Marco Polo, except by Huc and Gabet, whose works, however interesting in other respects, have failed in affording any sound geographical knowledge.

Among the undescribed tracts dependent upon China is, for

example, the great peninsula of the Korea lying between China proper and Japan. Extending over 10° of latitude (from 33° to 43° north lat.), this temperate country, known to be the seat of rich mines, much agricultural produce, and certain branches of manufacture, has hitherto been as completely shut out from Europe as Japan was until recently. Our Associate, Captain Allen Young, so admired for his Arctic services, has led the way in suggesting the desirableness of opening out a commercial intercourse with the capital of the Korea. Twice conquered by the Japanese, the Koreans are now tributary to China; ingots, furs, and other articles being annually sent as tribute to Peking, with which capital they also keep up a trade in carts which travel round the head of the great gulf of Leotung.*

Now, inasmuch as European and American Governments have established commercial relations with the Chinese on the one hand and with the Japanese on the other, it seems almost certain, that with such a tempting intermediate prize stretched out before them, and along the coasts of which they are constantly sailing, speculative mariners and adventurers will ere long obtain the means of trading with this new land of promise. As, however, the current of public opinion in this country, differing widely as it does from that which prevailed in the days of Queen Elizabeth, is strongly opposed to any attempt being made to open forcibly new marts for trade, I apprehend that our Government would be under the necessity of discouraging any isolated efforts of individuals which might lead to political difficulties in the far East. At the same time there can be little doubt that any strong nation, not imbued with such scruples, may easily compel the Koreans to open their country and listen to pleas which no mere diplomacy nor private endeavours could possibly bring about. As soon, then, as this opening is made, geographers will have a grand new field for their researches, and they will verify or modify the stories which have been told us of the populous towns, rich productions, large navigable streams, and varied scenery of a peninsula as large as Great Britain!

With regard to other parts of Asia I may first point to New Guinea and here express my thanks to Sir Charles Nicholson for having specially called the attention of our Council to the importance of extending a survey of the accessible parts of this almost unknown land, lying within a few hours' sail of the north-eastern

* Captain Sherard Osborn informs me that when he was in Peking he found the warehouses connected with Korea charged with the following products of that country: tobacco of first-rate quality, paper of great variety, woods of great use, short-staple silk, and many metalliferous ores.

promontory of Australia. This large island stretches from the Equator to between the 8th and 9th degrees of south latitude, possesses a length of 1400 miles, with an area twice that of the British Islands. Yet in looking over our volumes I discover but three notices respecting New Guinea. The first of these is a short notice, by the late Admiral Washington, of what the Dutch had been doing, and admitting that we ourselves had done nothing since the time of Dampier; since then, however, our surveying vessels the *Fly*, under Captain Blackwood, and the *Rattlesnake*, under Captain Owen Stanley, have surveyed large portions of the coast. The second notice is by Mr. Macgillivray, the naturalist of Captain Stanley's expedition, and the last by Mr. Alfred Wallace.

The Dutch have been more enterprising than ourselves, for between the years 1828 and 1835 they sent three different expeditions to New Guinea, which surveyed some portions of its little-known south-western coast, on which they made unsuccessful attempts to form settlements, being baffled by the insalubrity of its climate. The sum of our present knowledge of New Guinea is, that it is sparsely inhabited by stalwart negro savages, in a lower condition than the hunting tribes of North America; that, with some exceptions, it is clothed with a primeval forest, and that in its interior there exists a high mountain range, supposed to be of such elevation as to be snow-clad throughout the year. Its north-western peninsula produces ornamental feathers and the true aromatic nutmegs, once so esteemed but now so neglected. Of the mineral products of New Guinea we know nothing; but the survey of a coast which extends over some three thousand miles, even if we should be unable to penetrate far into the interior, well deserves the consideration of Geographers, to say nothing of the commercial advantages which may follow.

The next neglected country to which I would call your attention is the great group of the Philippines, consisting, according to Spanish estimate, of 400 inhabited islands, one of which is one-half larger than Ireland, and the whole containing (exclusive of mountain negroes) a population of the Malayan race, amounting to 5,000,000, tolerably civilised and converted to Christianity. Concerning this mighty archipelago of the Philippines, which is within a couple of days' steaming of China, of five days' steaming of our own settlements, and with which, exclusive of the Indian trade, we carry on a direct commerce of the annual value of above two millions and a half, there is not a single paper in our records.

Finally, the empire of Japan remains for interior exploration, with its computed 30,000,000 of people, the most ingenious and industrious of all the nations of Asia next to the Chinese. Our direct commerce with Japan is already of the value of a million and a half, the Japanese exports consisting chiefly of tea and silk,—commodities which the Japanese never exported before, and which must, therefore, be considered as the offspring of their newly-stimulated industry. Respecting this great country there are but two Papers in our records, one by our Consul at Hakodade, the port of the barbarous island of Yedo, and one by our distinguished Associate, Sir Rutherford Alcock, now happily for our science and the public weal, promoted to the Chinese Embassy.

Looking next to Arabia, let me remind you that it is only a year ago since we obtained a first glimpse of the nature and condition of the interior and its Wahabee inhabitants, through the adventurous journey of Gifford Palgrave. Here, again, we have still very much to learn; for, alas! we must confess that, with all our modern means and appliances, we are even now less acquainted with this huge peninsula than were the ancients in the time of their great geographer Ptolemy.

I had indeed the satisfaction of recently announcing to the Society, that this defect will in all probability be soon, in one essential respect, removed by the enterprise of Colonel Pelly, our Political Resident at Bushire, in the Persian Gulf, who not long ago visited and described parts of the coast of Persia, including the ports of Lingah and Bunder Abbass, and the remarkable saliferous island Kishm. Travelling openly, as an accredited British envoy, Colonel Pelly has taken with him into Arabia instruments to fix geographical positions, and men of science* to develop the geological structure, as well as the living fauna and flora, of the great central region around Riadh, the capital of the Wahabees. This is an enterprise worthy of our warmest commendation; for it has been undertaken by this enterprising public servant in consequence of his reading our 'Proceedings,' and learning from them that we attached the highest importance to the acquisition of this very knowledge.

Then in Central Asia—albeit many of our countrymen who have issued from Hindostan have done very much to clear away obscurities, we are, I regret to say, still waiting for the grand map on which, thanks to the energy and ability of a British Ambassador, the features of a broad band of country between Turkey and Persia

* Mr. W. H. Colvill, Resident Surgeon, Bushire, and Lieutenant Dawes.

have been for the first time laid down.* Without reverting to the tracts between Russia and Mongolia before alluded to, there are countries of unmeasured dimensions over which no Geographer has roamed.

I was, indeed, in hopes, as I stated at the last Anniversary, that, through the ability and learning of the eminent scholar and orientalist who I then thought would be chosen to fill the chair after this occasion, your attention would be directed to fresh fields of exploration in the East. And although Sir Henry Rawlinson cannot, I regret to say, undertake the duties of a President, I trust that, as one of our Vice-Presidents, he will so influence his old colleagues in the Government of India, as to induce them to cause an exploration to be made of the great unknown region between Hindostan and China, which is watered by the mighty River Burhampooter. This project has already been much supported, and was about to be undertaken, when, through the apprehension of engendering political embroilment, it was abandoned. Considering, however, the peaceful relations which now exist between our country, the Celestial Empire, and Japan, let us hope that this new line of intercourse may be opened, and that, instead of weakening, it may strengthen our alliance with those remote countries.

In thus adverting to some of the tasks which remain to be performed by Geographers in Asia, I may remark, that, notwithstanding all the labours of that vigorous veteran explorer and ready writer, my valued friend John Crawford, and of the sound naturalist Wallace, I have already shown that abundance of rich materials remain to be gathered in the Indian and Malayan Archipelago before we become thoroughly acquainted with the physical geography, geology, botany, ethnology, and meteorology of those highly diversified islands which range from Timor to the Philippines. The last-mentioned group, indeed, as I have already mentioned, is really little better known now than it was when discovered by the Spaniards.

In Africa, notwithstanding the efforts of our countrymen and

* The production of this great map is essentially due to the vigorous and clear instructions issued by our enlightened Associate, Viscount Stratford de Redcliffe, when he was Ambassador at Constantinople, and it has been chiefly executed by the persevering and able surveys of Lieutenant Glascott, R.N. In instructing Colonel Williams, now Sir William Williams of Kars, respecting that survey, Sir Stratford Canning, in a lucid despatch, dated Dec. 9, 1848, thus writes:—"Nor is it too much to hope that, by bringing the local features of a region hitherto little or not at all frequented by intelligent travellers to the notice of the civilised world, your commission may assist in extending the sphere of useful knowledge, and eventually in opening out new channels of commercial intercourse." Let us hope that the excellent maps resulting from this survey may at length be published by H.M. Government.

the researches of other nations, there are enormous tracts, as you all know, to which the first approaches are now about to be made by Livingstone, Du Chaillu, and Walker,* as well as by the spirited German explorer Charles von der Decken. The perusal of the excellent volume which Livingstone is just about to issue, with the assistance of his brother Charles, and the natural history details and descriptions of Dr. Kirk, and the geology of the lamented young Thornton, still leave the indisputable fact, that after all these praiseworthy efforts there are still large unknown regions in Southern Africa.

Considering the doubts and uncertainties which still prevail respecting the true watersheds of Central and Southern Africa, I proposed, as I have already stated, last year, to our Council that we should endeavour to remove these obscurities by promoting an expedition up the White Nile. Certain political circumstances, however, seem to render it but too certain that the ardent desire of Geographers and philanthropists to have the region below and above Gondokoro properly opened out as a highway of commerce, must for the present be postponed. Until some stop is put to the misconduct of traders on the White Nile in pillaging and making slaves of the natives, no hope can be entertained of realizing our anticipations.

What we have now to hope for is, that the vigorous Samuel Baker shall have been enabled to work out in the interior and determine one great feature of the geographical problem which Speke and Grant believed they had solved. When last heard of, Mr. Baker was at Unyoro, and we most earnestly hope that he may have been enabled to settle the question as to the southernmost origin of the waters flowing westward of the Upper Nile of Speke and Grant, which descend from the elevated plateau in which the great Lake Victoria Nyanza lies.† If, through his researches, the waters flowing into the Luta Nzige of Speke, as well as those of the river Kitangule, are found to rise in the mountains seen by him to the west of Karagwe, one of the ultimate tributaries of the Nile (for there may be many) will have been followed to its source. And if those mountains really range in an unbroken form from east to west, as represented in the map of Speke, the suggestion which has

* See Report of Council of R. G. S. for an account of the proposed journey of Mr. Walker to explore Equatorial Africa eastward of the Gaboon.

† It is highly gratifying to know that a Company has been established, which, having its head-quarters at Khartum, intends to develop commercial relations with the interior, particularly with Nubia. I also learn that the Pasha of Egypt sanctions one of the main projects of this Company, viz. that of enabling vessels to pass by the cataracts, through a system of canals and locks, thus rendering this mighty stream navigable from its mouth to Gondokoro.

been mooted of the possibility of the White Nile being fed from the Lake Tanganyika will fall to the ground.

In the mean time, however, it has been deemed highly desirable to endeavour to determine the watershed of Central Africa by an examination, in the first place, of the region lying between the Lake Nyassa of Livingstone and the Tanganyika of Burton and Speke, by sending a well-considered expedition to that part of Africa. The Council, therefore, willingly agreed to a proposal of my own, that the tried and successful traveller Livingstone should be the leader of such a survey. On this occasion my friend will not have the disadvantage, which attached to him in his last travels, of being hampered by other duties than those with which Her Majesty's Government may intrust him in a mission to the independent native chiefs who live to the north of the Rovuma River, and consequently beyond any district over which the Portuguese Government claim authority.* In addition to his efforts as a Geographer, he will at the same time be paving the way for the introduction of social improvements among the natives, by the promotion of fair barter and commerce, to the exclusion of the trade in slaves, and thus will act as a pioneer in removing those obstacles which at present render the travelling of Christian missionaries into those wild and savage tracts, with which they are wholly unacquainted, not only a hopeless enterprise, but one which is fraught with disaster and profitless suffering. No one feels more strongly than the honest and long-tried Livingstone, that the introduction of a kindly intercourse through legitimate trade, and the establishment of confidence on the part of the natives, must be the forerunner of all efforts to convert the untutored negro to Christianity. That Christian missions may most profitably be extended into the interior from any settled British colony is, indeed, most true; and we can have no better proof of this than the great success of the venerable Moffat to the north of the Cape Colony. But such success could scarcely have been anticipated from a Church of England mission to the Portuguese territory on the east coast of Africa to which Livingstone recently bent his steps, and in which few persons, except one so acclimatized as himself, would be likely to succeed or indeed to survive.

In this new enterprise, Livingstone will first determine whether

* The Royal Geographical Society having taken the lead in recommending this Expedition, and having voted 500*l.* towards it, Earl Russell on the part of Her Majesty's Government, as before stated, took advantage of the opportunity, and appointed Dr. Livingstone to be Her Majesty's Consul and Envoy to the chiefs of Inner Africa with the view of opening out legitimate trade, and so check the trade in slaves.

his own Lake Nyassa receives any waters from the north, and next whether the Lake Tanganyika is fed by rivers coming from the south. He will then fix accurately the elevation of the Tanganyika, and, examining its western side, will ascertain to what extent waters flow into or out of it, and, if possible, he will further settle the great question of whether any waters may flow northwards from the Tanganyika towards the Nile, as suggested by Beke and Findlay, whose views have been recently adopted by Burton; or, on the other hand, he will decide if this lake is subtended on the north by lofty mountains, as drawn upon the earlier map of Speke.

Nothing short of actual exploration can determine these questions; for, it must be admitted that, though there is a space of about 360 miles between the Tanganyika and the Nyassa, yet, if it even be the fact that the former lake is a few hundred feet above Gondokoro, it is just possible that the waters should flow northwards from Tanganyika, provided there be an intervening low country to the west of the mountains seen by Speke and Grant. Geographers well know that some of the mightiest streams rise at very low altitudes. Thus, the Volga, which rises in the Valdai Hills at the low height of 550 feet above the sea, is a fine flowing river for a length of 2700 miles, and drains an area of 400,000 square miles before it falls into the Caspian Sea; and thus it is possible that the Tanganyika may be shown to be one of the main feeders of the Nile, and, if so, we shall have to admit that we were too hasty in our conclusions of last year respecting what was called *the source* of the Nile, albeit that no Geographer attached to that term the idea of a fountain or river-head, but simply that the Lake Victoria Nyanza was, as we supposed, the great water-basin of the mighty stream.

Such, doubtless, was the leading idea of Speke; and if he claimed too much in asserting his belief that the Victoria Nyanza was in that sense *the source* of the Nile, the conclusion on his part was very natural, seeing that this body of water was so much higher than the low and far distant Tanganyika, and that he had observed lofty mountains to the north of the latter.*

* Recently Signor Miani published a pamphlet at Constantinople, which he dedicates to me. With every wish that this Venetian traveller should have all due merit for labours which preceded those of Speke and Grant, but in which he never reached their southern latitudes, and in the hope that, in a third journey which he was about to make, he might be able to succour our countryman Baker, I wrote to my friend M. Haidinger of Vienna, and alluded to Signor Miani in encouraging and applauding terms. A translation of this letter was sent to the explorer, in which he states in his pamphlet that I styled him "*Esploratore profondo*." Now, I could not have used this

In taking leave of the consideration of the unsolved African problems, let us not forget the resolute and self-possessed conduct of Du Chaillu, who, having exhausted all the means he had acquired by the sale of his striking work on the Gorilla region in fitting out a new expedition, has actually proceeded from Fernand Vaz into the heart of Equatorial Africa without one European companion—resolved to find some of the head-waters of the Congo or of the Nile. If he should be so fortunate as to fall in with the latter, and should follow them to where the mighty stream becomes navigable, and so descend to the Mediterranean, he will have performed a feat which will place him in the first rank of African explorers.

Among the desiderata on the eastern side of Africa, I must not omit to notice the interesting field of research which is offered to the geographer, geologist, and naturalist in Madagascar. At our last meeting* attention was called to our imperfect acquaintance with this huge, rich, and diversified island in which our missionaries, and particularly Mr. Ellis, have so signally distinguished themselves by introducing a written language and by inculcating Christian doctrines. We may indeed rely on the ability of Dr. Meller, one of the companions of Livingstone, the newly-appointed Vice-Consul at Antananarivo, who is about to proceed thither to make such observations as will improve the map of the island, made many years ago by Arrowsmith. At the same time I may remind you that in the twentieth volume of our Journal you will find a small map of the island by Colonel Lloyd and Mr. Corby, and also an abstract of all the manuscripts, books, and papers respecting Madagascar collected during the long possession of Mauritius by the French, as made by our Associate, Mr. W. J. Hamilton.†

I need not dwell at any length upon the subject which has of late so deeply engrossed your thoughts, and was discussed at three of your evening meetings—the despatch of an expedition to determine the real physical character of that great area of the Arctic region which lies around the North Pole. It has, indeed, been a source of the sincerest gratification to myself to see how the project, started by our Society,

expression in reference to this traveller, for I knew too little of his works as a Geographer to be authorised to speak of them as *profound*. M. Haidinger has indeed sent me at my request a copy of the paragraphs of my letter which probably, through a bad translation, have caused the mistake, and there is no such expression in them. I still trust that Signor Miani may, by uniting his travels with those of Baker, render us really good service in indicating the true physical features of the country south of Gondokoro.

* In a paper by Dr. Gunst.

† These documents were brought to England by a former Governor of Mauritius, the late Sir R. Farquhar, and were deposited by his son in the British Museum, where they may now be consulted with advantage by any one about to explore Madagascar.

has been supported by the Royal, Linnean, Geological, Ethnological, and other Societies. To take a lead in such a cause as this, and to be the body which has striven to carry it out by an appeal to the Government of our country, is at once an evidence of the high position to which our Society has attained. Deeply indebted to Captain Sherard Osborn for originating this proposal, and for the energy and ability with which he supported his own line of research, or that of proceeding, by a sledging-party, from vessels to be stationed in Smith Sound, by which the north-western flank of Greenland would be defined, we have also to record our obligations to Dr. Petermann for his advocacy of the search being made by pursuing the direct maritime route towards the North Pole from Spitzbergen. Your Council, seeing advantages in both schemes, would be too happy if, in the cause of science, each of them could be put into execution. But if one only can be obtained, we must leave it to our rulers to make the selection. At the same time let us be just, and say that, if the plan of Sherard Osborn be carried out, it is to the energy and spirit of an American citizen, Mr. H. Grinnell, and the devotion of that chivalrous explorer Dr. Kane, that we owe our first acquaintance with the coasts of Smith Sound and the tracts north of it which are to be the route of the proposed expedition.

Among valid reasons offered by the Councils of other scientific Societies, I specially direct your attention to the able appeal of the Naturalists made by the Linnean Society, as printed in our 'Proceedings ;' * and I would also remind you of the words spoken to us in this hall by General Sabine, the President of the Royal Society, and himself the companion of Parry in his memorable voyages both to the Parry Islands and beyond Spitzbergen. In earnestly supporting the project, he told you "that it was not to be supposed in the present day, when the interest in geographical and in all the other physical sciences has so much increased, that so large a portion of the globe, lying almost at our hands, should remain unexplored."

It must also be highly satisfactory to the Fellows of this Society to be informed that a project, which has been so heartily approved by them and the other scientific Societies of the metropolis, has been applauded by foreign men of science, who are thoroughly competent to appreciate the difficulties to be overcome in Arctic navigation. Desirous of ascertaining the opinion of that eminent

* Vol. ix. No. iv.

Russian circumnavigator and Arctic explorer, Admiral Lütke, now President of the Imperial Academy of Sciences at St. Petersburg, I begged him to lay our project before the body over which he presides. In this way a committee of distinguished philosophers,* all of them great travellers, drew up a report, which was cordially approved by the Imperial Academy, as communicated to me by the Perpetual Secretary, accompanied by a most encouraging letter from the President himself, who assured me that the Imperial Geographical Society and the President, the Grand Duke Constantine, also warmly approve the project. Admiring the efforts we are making to obtain a North Polar Expedition, and thus add to the fame of former British and American † exploits, and eulogising the noble efforts by this country in the search after Franklin, the Imperial Academy points out what, indeed, I have myself previously indicated, that all our energies were at that time so directed among frozen channels between numerous large islands, as of necessity to prevent the examination of the region around the North Pole, which, judging from various circumstances, is in all probability largely occupied by water, and, if so, less cold and more accessible than the region around the magnetic pole. Seeing

* This Committee consisted of MM. Baer, Helmersen, Kupffer, and Savitch.

† No one who has frequented the meetings of our Society can fail to know with what sincerity and warmth the North American expedition, fitted out by Mr. H. Grinnell of New York, and so heroically commanded by Dr. Kane, has invariably been recognised by British Geographers (see my own Address of 1852, p. lxxix.), I am led to recall attention to this fact, from having read in the New York 'Evening Post' of the 9th May a criticism under the head of 'Arctic Exploration,' in which the editor points out inaccuracies in Capt. Sherard Osborn's allusion to the fitting out of the Grinnell expedition. Now, I feel certain that my gallant friend simply meant to impress upon others the idea with which he is thoroughly imbued, that nothing short of a thoroughly substantial Government expedition, expressly fitted out for the purpose and supplied for several years with provisions, can ensure complete success in a great Arctic enterprise. At the same time I regret that, in forcibly illustrating that view, his language should have been thought to criticise the deficiencies of the expedition fitted out by Mr. Grinnell. If persons who have doubts on this subject had only read all that Capt. Osborn said on the occasion, they would see that he fully appreciates the strenuous exertions made by Dr. Kane under unparalleled difficulties. I have before stated that our kinsmen were the first to open out Smith Sound, but I regret that the only printed account of Hayes's subsequent remarkable expedition along the west side of Smith Sound has but just reached me. From it I learn that the intrepid voyager went considerably further north than the extreme point reached by any of Dr. Kane's parties; he also penetrated for 50 miles into Greenland to examine the great interior glaciers. Believing from the pressure of ice that he had nearly reached the northern end of Greenland, he suggests that the western or Grinnell Land faces the great Polar Ocean. To Dr. Hayes belongs the credit of first pointing out the route towards the Pole recommended by Sherard Osborn, and I rejoiced in reading the concluding paragraph of the article referred to, in which a stirring appeal is made to Americans to be first in reaching the North Pole from those high latitudes which it is their glory to have attained.—*R. I. M.*, June 5, 1865.

that England has already accomplished so much in Arctic exploration, the Imperial Academy feel, like ourselves, that our country should not yield to any other nation the glory of determining this great geographical problem. The Academicians of Russia conclude by expressing their belief in the force of the sentiment to which our Council has given utterance, that this survey, in addition to keeping up the spirit of adventure in our navy, will be the best possible preparation for the future exploration of those Antarctic lands, on which, in 1882, the transit of Venus over the sun can alone be observed with accuracy.

Fortified by such powerful support, I have, on the part of the Council, appealed to the First Lord of the Admiralty and Her Majesty's Government, enumerating the advantages to be derived from a North Polar expedition, and at the same time have transmitted copies of all the various supporting documents from other Societies, together with the reports of our own discussions, in the earnest hope that the numerous and powerful reasons assigned may bring about a successful issue.

If, after all, we should fail in obtaining our request, we shall enjoy the satisfaction of having been sustained by the science of Europe, and of having been opposed by those persons only of this great maritime country who see no merit in any advancement of knowledge, if it does not carry with it political or monetary profit. Leaving, then, a more enlightened posterity to judge our motives, we may rely confidently on their verdict being given in favour of the efforts we have made to bring about the solution of this grand geographical problem.

I have thus endeavoured to present to you an outline—most imperfect, indeed—of some of the main discoveries with which this Society has been connected during more than a third of the present century, and also to sketch in a broad manner the many labours which have yet to be performed by ourselves and our successors. In following out this plan I have already extended this discourse to such full limits, that I may have exhausted your patience, without touching upon many subjects of the highest interest, particularly as to the progress of our science in other countries. The consideration of these topics must therefore be deferred to another occasion. It now only remains for me to thank you heartily for the friendly support you have tendered to me during the many

years I have had the honour of presiding over you. Such proofs of your good opinion and esteem, as well as that signal honour of having been named as your representative in the Royal Charter which constitutes us a body corporate, have penetrated me with feelings of the warmest gratitude.

At the last anniversary I distinctly stated that I should be under the necessity of resigning the chair at the close of the session; for I could not, at my time of life, calculate on being able to continue to discharge my duties to you, in addition to official service and other calls upon my time. Besides, I conscientiously thought that I should render you the best service by inducing you to select a younger man than myself; and in this spirit not only was the arrangement made, but the very paragraphs in the Address were written, in which the merits of my intended successor, Sir Henry Rawlinson, were indited, when that eminent scholar and explorer, to my surprise and regret, found it impossible to undertake the duty. In this difficulty, my friends so strongly urged me to continue to serve that I have consented to complete my biennial term of office; and I have now only to assure you, gentlemen, that if you should re-elect me, I will make a last effort during the ensuing year to promote the best interests of the Royal Geographical Society.

P.S. Since this Address was read, Lieut.-Colonel Pelly, H.M. Political Resident at Bushire, who has been alluded to (p. 261), has arrived in London. At our next meeting he will give us a sketch of his recent important journey from Kowait, at the head of the Persian Gulf, to Riadh, the capital of the Wahabees, where he was well received by the Imaum. He returned to the Persian Gulf by an entirely different route through El Ahsa to Okeir. Colonel Pelly and his associates have made many astronomical observations by night, unseen by the natives, fixing the latitude and longitude of places; thus contributing the first accurate data we have obtained respecting the geography of the interior of Arabia. Having also collected specimens of the rocks and wild plants of this north-eastern region, they have added data of great value to the original sketch of Inner Arabia, communicated to us in outline last session by Mr. W. Gifford Palgrave.

This last-mentioned traveller has just issued his completer

work under the title of 'Journey and Residence in Central and Eastern Arabia;' and after a rapid perusal I can commend it as a graphic and attractive account of the habits and life of the Arabians, from the wild Bedouins of the desert bordering on Syria, and those of the territory of Djebel Shomer, and of the strict Wahabee Mahommedans who inhabit the powerful kingdom of Nejed. Travelling as a Christian physician of Syria, Mr. Palgrave necessarily had intercourse with a great variety of characters, whose peculiarities he describes with great point; whilst his sketches of the features and statistics of the countries he passes through, including the coasts of Oman, and the details of his fifty days' residence in Riadh, the capital of Nejed, prove him to be a most skilful word-painter. For, although there is not a pictorial sketch in his two volumes, no reader can peruse them without obtaining a new and clear insight into the present condition of a country never visited by any European writer of modern times until Mr. Palgrave made his bold and successful journey.

Note on the Boundaries of Russia and Northern Turkestan.—A *résumé* of the progress of Geographical Science, during the past year in Russia, would be incomplete without a reference to the very important materials relating to the Geography of the Trans-Ili and Trans-Chu regions, which have been placed at the disposal of the Imperial Geographical Society, by the military authorities at St. Petersburg. The new materials, which I take from the last 'Compte Rendu' of the Imperial Geographical Society, received since the Anniversary, consist of a manuscript map, compiled by Colonel Poltoratski on the scale of 40 versts to an inch, of the southern portion of the Kirghis Steppe, or that extent of country which comprises the south-western portion of the territory of the Orenburg Kirghises or Little Horde, the southern portion of the territory of the Siberian Kirghises or Middle Horde, the Great Kirghis Horde, and the northern part of Western Turkestan or the northern portions of the Khanats of Khokand, Bukhara, and Khiva, collectively known under the name of the Turan. This extent of country is partly conterminous with the extreme south-eastern angle of the Russian empire, and, in consequence of the Russian military expeditions of last year, has attracted considerable public attention. In the map just mentioned are, for the first time, incorporated all the results of the Russian explorations undertaken during

the last few years; unfortunately their results have hitherto existed in an isolated form, and are to a great extent unknown to the scientific world.

Many astronomical points have been fixed along the course of the Syr-Daria, and on the Chinese frontier, which will serve as a true basis for a map of this region. The astronomical position of the whole of the above-mentioned country, and particularly that of Western Turkestan and of the Khanat of Khokand, must be considerably changed. Many points must be transferred to great distances both in latitude and in longitude. The mountains forming the western branch of the Thian-Chan, or Celestial Range, form the prevailing orographical features of the region; these mountains stretch from east to west from Issyk-kul, around which lake they bend, to the lower course of the Syr-Daria, and were formerly known under the vague name of the Kara-tau Range. All the mountains of the Thian-Chan system may be divided into three groups: namely, the Kentchi-Alataù, the Alexandrofski, and the Kazikurt Ranges. The Kentchi-Alataù Range consists of two parallel chains which gird the northern shore of Issyk-kul; they are separated (to the east of Issyk-kul) from the Thian-Chan by the Santash Pass. Their extreme elevation is 14,000 feet. From this group secondary chains of mountains extend to the north-west, and form the water-parting between the Ili and Chu. The second group—the Alexandrofski Range or Kirghisnin Alataù—the summits of which are covered with eternal snows, unites with the first or Kentchi-Alataù group near the western extremity of Lake Issyk-kul, at the Baùm defile; from thence it stretches in a straight line to the westward, reaching Aulieta, and separating the river Chu from the river Talas. Its greatest elevation is 15,000 feet. To the west of this range, a chain of hills extends as far as the Syr-Daria, and a parallel chain runs to Djulek, both forming, as it were, a continuation of the Alexandrofski Range. Their elevation does not exceed 5000 or 6000 feet, and to them properly belongs the name of Kara-tau which has been incorrectly applied to the whole mountainous system of this country. The third and last group—the Kazikurt Range—is situated to the south of the Alexandrofski, from which it is separated by the basin of the Talas, and apparently forms a continuation of the main branch of the Thian-Chan, which bends round the southern shore of Issyk-kul, and fills the territories of Khokand with its southern ramifications. The disposition of these chains

also determines the local water-system, the principal basins of which are those of the Chu and of the Syr-Daria. These two rivers divide the region into two parts, into the country of the Chu and the valley of the Syr-Daria, both running parallel to each other. The valley of the Syr-Daria extends in a sinuous line from the south-west to the north-west, the river Chu running in the same direction. Both basins, corresponding with the distribution of the mountain-chains, become contracted towards the east, near Issyk-kul, where the abovementioned ramifications of the Thian-Chan converge. It must also be observed that the prevailing direction of the mountain-chains, both here and in all the mountainous parts of Central Asia, is to the north-east. More precise data have been acquired respecting the Chu, particularly with regard to its sources, and its relation to Lake Issyk-kul, out of which it does not flow, but with which it is connected by its upper affluent, the Kuternaldy. The basin of the Syr-Daria along its middle course has been minutely and successfully examined by Admiral Butakof, who lately communicated to the Imperial Geographical Society the general results of his labours and of his explorations between Fort Perofski and Baidyr-Tugai. After the military expedition of 1862 the greater portion of the Kirghises, who roamed beyond the Chu, crossed over to the Russian side. The Khokandians, with the object of retaining the Kirghises in subjection, had erected a great number of forts or kurgans in the steppe. The principal of these were Pishpek, Merké, Auliéta, and Suzak. Auliéta, situated on the Talas, between the valley of the Chu and the chain of mountains which stretches from Issyk-kul westward, occupies an important position, as it stands on the great commercial highway which runs from Tashkend and Turkestan towards Veruvé, Kuldja, and Semipalatinsk. This route is followed by the caravans of Central Asia when proceeding to Russia and China. On a branch of this route, which leads direct from Khokand and Tashkend in a north-westerly direction to the point of junction of the routes of Orenburg, Troitsk, and Ufa, stands the town of Turkestan, which, no less than Auliéta, is important in commercial respects, and contains the most revered edifice in all Khokand—that of the mosque erected over the tomb of Azret Sultan.

June 30th.—Just as this Address is about to be finally printed off, the gratifying intelligence has been received, through the Foreign

Office, that Mr. Samuel Baker has returned to Khartum, having made the important discovery of a second great lake, whence the Nile issues, and which he has named "Albert Nyanza." Judging from the latitude ($2^{\circ} 17''$ N.) given in a very brief telegram, I have little doubt that this lake is the Luta Nzige heard of by Speke, and who enjoined Mr. Baker to explore it when the travellers parted at Gondokoro.
