ADDRESS

TO THE

ROYAL GEOGRAPHICAL SOCIETY OF LONDON;

Delivered at the Anniversary Meeting on the 27th May, 1844.

BY

RODERICK IMPEY MURCHISON, Esq., V.P.R.S., &c.

PRESIDENT.

Gentlemen,—At the last Anniversary, when by your kindness I was elected President of this Society, I was travelling to collect additional materials for the completion of a work upon the geological structure of Russia and the Ural Mountains; and in now thanking you for the high honour you conferred upon me, I allude to that circumstance, and to the work, in which I am still incessantly engaged, in the hope that you will therein find some excuse for the deficiencies which must pertain to the following pages, if compared with the discourses of my more learned predecessors. Their perspicuous, general, and systematic views have, indeed, so thoroughly unfolded and explained all the leading objects of the Royal Geographical Society, and you are so penetrated with their truths, that it would be unbecoming in me, even if I had the power, to re-enact a part which could only be required when you were beginning to take your place among other scientific bodies.

Originating thirteen years ago amid a few travellers of the Raleigh Club, of whom, I am proud to say, I was one, the Geographical Society of London has now reached that age when it no longer stands in need of any appeal to principles explanatory of the nature and design of its researches—the value of which is, I trust, justly estimated by the British nation. A narrative of the progress of our science in the past year is, in truth, the only dissertation you require, which, whilst it brings before you, in one view, the recent acquisitions to geography, enables your President to express his own opinion upon subjects which

have occupied his thoughts, and leaves you free to comment upon others with which you are more conversant than himself.

Before, however, I turn to the long register of geographical discovery in various parts of the world during the past year, I must congratulate you on a new and pleasing feature which marks this Anniversary. You have doubtless listened with great satisfaction to the Report of the Council, which states, that our ranks have been swelled by many new members, among whom are persons the most distinguished in the land. First stands the name of the Consort of our gracious Patron the Queen, who, with that kind condescension which characterizes His Royal Highness, has been pleased to accede to the unanimous wishes of the Council, that he should occupy the post of Vice-Patron, vacant by the decease of His Royal Highness the Duke of Sussex. The warm interest which Prince Albert has evinced for letters and the arts, and His Royal Highness's good taste in patronizing them, have already been appreciated by the public; but those posts in science which were befitted to his exalted station being held by that true friend to the extension of knowledge, the Duke of Sussex, it was only upon his demise that His Royal Highness Prince Albert had the opportunity of publicly testifying his respect for our pursuits. The enrolment of Prince Albert as our Vice-Patron must therefore be viewed, not merely as a proof of His Royal Highness's good will, but also as the harbinger of our rise in the opinion of the British people, by whom he is so justly beloved.

In referring you to the copious list of new members, I beg also to mention the names of three men of science, whose assistance and co-operation must be considered of good augury: the Marquess of Northampton, the Earl of Rosse, and Sir Henry T. De la Beche.

The first of these valued friends, long known as the warm promoter of many branches of science, and worthily presiding over the Royal Society, has, I assure you, both a true love for our occupation and many characteristics of a physical geographer; for his Lordship possesses, in an eminent degree, the powers of correctly delineating natural outlines, and of determining the nature of the minerals in the earth.

The second, putting into action his high attainments in mathematics, astronomy, mechanics, and chemistry, has rendered himself conspicuous by his manufacture—aye, gentlemen, and, to a great extent, by his own hands—of a reflecting metallic telescope so colossal, that it will enable him, I trust, to lay down, with infinitely greater precision and detail than were formerly practicable, the external form of our nearest neighbour in the planetary system. And as geographers could not have fixed the relative positions of places upon the earth, without an acquaintance with

the celestial bodies, so may the Earl of Rosse, reflecting back terrestrial knowledge upon the moon, and tracing therein the shape and dimensions of mountains, vales, fissures, and volcanoes, be justly said to have earned for himself the title of the "Selenographer" of modern science. Is it not indeed to be wished, that before our next Anniversary we may be enriched by some communication from our new member, in which he shall compare with forms of the earth to which we are accustomed, those rugosities of the sister planet, in which he will doubtless make many new discoveries?

Thirdly, I hail the accession of Sir Henry T. De la Beche, the Director of the Ordnance Geological Survey, whose daily pursuits are intimately connected with our own. When I know that he is incessantly labouring more efficiently to co-ordinate precise geometrical formulæ with geological phenomena, and to establish more correct drawings of outline as dependent on physical causes—when I see that in his hands the Museum of Economic Geology, whether as respects natural products or the works of man, is becoming an emporium in the broadest sense of the word "geographical," I cannot but rejoice that my old associate, in a branch of science so closely akin to our own, should have completed the triad of leading scientific men who have this year joined our ranks. Ably as such persons may assist us, their alliance is, however, doubly valuable for the proof it holds out to the public of the real value and utility of the Royal Geographical Society.

Obituary.

Though the nature of this Address precludes a lengthened dissertation, in which justice can be done to the memory of all our deceased members, many of whom, distinguished as they may be in public or private life, have not rendered contributions to the storehouse of science, a few expressions of sorrow and regret for the loss of travellers and geographers during the past year, and some allusion to their merits, form a necessary duty of the President of this Society.

At the head of this list I place the name of John Bacon Sawrey Morritt, who died at his seat of Rokeby in Yorkshire on the 12th of July, 1843, and in the seventy-second year of his age. Highly educated as a classical scholar, Mr. Morritt became conspicuous in early life by his travels in Greece and Asia Minor, a portion of which countries he critically illustrated in a work upon the Troad, which, from successfully combating the opinions of Mr. Bryant, who contended that the "fuit Ilium" was a fable, obtained for him the honourable sobriquet of "Troy Morritt."

Serving his country during a long period, both as a magistrate and a member of Parliament, Mr. Morritt never relaxed in his pursuit of antiquarian and historical lore, and was for many years an active contributing member of the Dilettanti Society, whose meeting room is now ornamented with an admirable portrait of their lamented associate, from the pencil of Sir Martin Shee. The object of the researches of this Society, it may be observed, has been, in a great degree, congenial with our own; as to them we owe the antiquarian missions sent into Asia Minor, under the conduct of our distinguished associate, Mr. C. Fellows, for the purpose of identifying the sites of ancient cities, and illustrating their history by their monuments. The gentleman whose memory I am now bringing before you, gave to the Dilettanti Society the advantage of his extensive classical knowledge, and of his acquaintance with art, by the preparation of two learned dissertations on the sculpture of the ancients, which are prefixed to the second volume of their work, entitled 'Specimens of Ancient Sculpture from different Collections existing in Great Britain,' and which was published in 1835.

Equally imbued with a love of national poetry, Mr. Morritt has, indeed, already become one of the "English Worthies," as the long-tried and chosen friend of Sir Walter Scott. The place which he embellished by his taste is now classic ground, through the poem of 'Rokeby,' whilst the eloquent biographer of the great Scottish bard has led every one to know how these boon companions "climbed the hills together."

Any one who like myself had the delight of being intimately acquainted with Mr. Morritt, and of living with him amid the shades of Rokeby, can testify that in freshness of mind and memory, and in the talent of reciting tales of the olden times, he was the very counterpart of his illustrious friend. Learned without pretension—witty without display—generous and hospitable without ostentation, he was an excellent specimen of a class now, alas! fast fading away—the Old English Gentleman. Happy are they who pass through life with such a friend! —and worthily has this good and virtuous man enabled his survivors to say, that so long as the name of Scott is venerated, so long will that of Morritt be honourably remembered.

One other English geographical traveller only, Mr. George Lloyd, is deceased, and he has to be mentioned as the editor of the papers of the late Captain A. Gerard. This fine young man was accidentally killed on the 10th of October last near Thebes by the bursting of a fowling-piece.

Mr. Nicollet, a celebrated American geographer, by birth a French-

man, died at Washington in October. Among his other works I may particularly mention his map embracing the whole of the Mississippi north of the junction of that river with the Missouri; the Missouri, to the distance of more than 1200 miles from its mouth; the country below the Mississippi, and the Lakes Michigan and Superior, to the 49th degree of lat., a region said to have been by his exertions more completely examined, and of which the map is more minute than that of any other part of America. Mr. Nicollet was a physical astronomer as well as a geographer; he was the favourite pupil and friend of La Place, and his name is frequently mentioned in the 'Mécanique Céleste;' he was also attached to the study of geology and ethnology. His death is said to have been caused by his application to the requisite calculations for the map to which I have alluded.

Mr. Hassler, another American labourer in the field of geographical labour, died in November last, while engaged in the survey of the American coasts, the continuation of which undertaking is now confided to Mr. Dallas Bache, well qualified, it is said, for the task.

M. Simons, a Belgian engineer, and corresponding member of the Royal Academy of Sciences of Brussels, died on his passage to St. Thomas, where he had been appointed director of the colony, and whence he was to have sent home an account of his scientific observations.

Our correspondents in France have lost two leading men in M. Sylvain F. Lacroix, a celebrated mathematician, author of a memoir on physical geography, and in M. Guillaume Barbier du Bocage: the latter was one of the founders of the Geographical Society of Paris.

I have also sincerely to deplore the loss of Major Emile Le Puillon de Boblaye, Vice-President of the Geographical Society of France, who to the qualifications of a good engineer added those of a very sound geologist. Employed extensively in the preparation of the great map of France and the survey of Algeria, Major de Boblaye is best known as the author, in conjunction with M. de Virlet, of a most instructive large work on the geology and mineralogy of the Morea, which forms the second volume of a splendid publication undertaken, like many others, to its great honour, at the sole expense of the French Government.* The death of M. de Boblaye has occasioned deep sorrow among many geologists and geographers, by whom he was as much beloved for his excellent social qualities as for his very high attainments.

In our own body I have fortunately not to record the death of a single

* Expédition Scientifique de Morée.

British geographer, notwithstanding what may be termed the risks of the profession. We have, however, to regret the decease of Sir Henry Halford, President of the College of Physicians, and Lord Abinger, Chief Baron of the Court of Exchequer, both members of our Society, and both eminent in their respective walks of life.

English Publications.

In the review which I shall now take of the progress of geography in the last year, I naturally commence with a brief account of British travels, surveys, and explorations.

Among the volumes directly connected with geography which have been published in our country during the past year, exclusive of communications to our own Society, I may mention the 'Personal Observations on Scindh,' by Capt. Postans; a translation from the German of a 'Description of Kordofan, and some of the adjoining Countries;' the 'Journals of the Missionaries Krapf and Isenberg in Abyssinia,' and 'the Highlands of Ethiopia or a Mission to Shoa,' by Major Harris. The two last-mentioned works will be subsequently alluded to in a review of the different explorations of Abyssinia.

But besides these, there are two publications upon Asia, and one upon the Alps, which specially call for notice; and of these I will first speak of the 'Historical Geography of Arabia,' by the Rev. Charles Forster. The object of this very learned work is to ascertain, in the first place, from the earliest records to which we have access,—namely, those of Sacred History—the different positions which were occupied by the original settlers; secondly, to trace the several ramifications of these primitive tribes, as they extended themselves over the other parts of the Peninsula, by aid of the lights which a critical examination of the writings of the classical geographers, as well as of native authors, have enabled him to throw upon the subject; and, finally, he has illustrated the conclusions which he has drawn from these sources by a reference to the works of the most celebrated modern travellers, whose narratives supply him with many arguments in confirmation of the localities, which he has been led to assign to the different tribes, the inhabitants of which are found still to exhibit the indelible traces of the parent stocks from which they descend.

It may appear, from the imperfect sketch that has been here given of it, that Mr. Forster's work belongs more properly to the province of ethnology. It is, however, throughout, so intimately connected with subjects of geographical inquiry that it claims to be honourably men-

tioned on this occasion, when we are commemorating the progress of that science during the past year. The discussions which it contains upon many controverted questions in this department—such as the country of the patriarch Job, the situation of Ophir, of Sheba, &c., and the course of the Roman expedition into the interior of Arabia, under Ælius Gallus—are treated of with an extent of learning, and a facility of applying it to the point in question, that are rarely to be met with.

And here, though it may be somewhat more foreign to our present purpose, I cannot omit to mention what is perhaps the most striking result of Mr. Forster's researches. I allude to the discovery he has made of a key to the unknown language in which the inscriptions found in Hadramaut, and other parts of Southern Arabia, are written. It has been applied successfully to the interpretation of those of Hisn Ghoreb and Nakob el Hajar, mentioned in the 7th and 8th vols. of our Transactions, and likewise to one since discovered at Aden. The method of interpretation was only perfected when the author's work was nearly printed off: much, therefore, that relates to it has been added in an Appendix; and though its value could only be tested by applying it to the limited number of inscriptions, of which he possessed accurate copies, the facts which these are found to record are sufficiently important to awaken the liveliest interest in the further prosecution of the subject. Additional materials for it will no doubt be collected by future travellers in that country, whose exertions will be stimulated by the hope of rescuing from destruction these memorials, which have been for ages unintelligible, and which, by the help of the extraordinary discovery now announced, may be found to contain the earliest contemporaneous records in existence.

The second work, the 'Narrative of a Journey from Herat to Khiva, and thence to Moscow and St. Petersburg,' by Capt. James Abbott, does not demand a long analysis, since the very difficult and peculiar situation of the author, whose mission was purely political, prevented him from adding much of geographical importance to our previous knowledge of those wild countries. This narrative affords, however, a striking example of what the energy, perseverance, and firmness of our countrymen can effect under the most trying circumstances, and gives us a sure earnest of how this gallant officer was destined to distinguish himself in the subsequent wars of Affghanistan. Suspected and betrayed by the Khan of Khiva—pillaged and severely wounded by the savage Turkomans, he still contrived to reach the Russian outposts on the Caspian Sea; whilst in passing over the dreary and desolate plateau of the Ust Urt, he made us acquainted with some facts respecting the extension of the Caspian in a former period, to which I shall afterwards

allude. In the Appendix to his work, Captain Abbott also gives a sketch of the manufacture of damasked steel prepared at Zlataust, in the Ural mountains, which I recommend to the perusal of all persons interested in the improvement of this branch of art. Thoroughly versed in the Asiatic methods of preparing steel, he has given a very clear account of the method by which that able officer, General Anosoff, has surpassed all his contemporaries in so uniting the properties of ductility and hardness as to produce the most clean-cutting scimitars. Having myself visited the same establishments in the Ural Mountains, and having been honoured with presents of their productions, including works of inlaid, engraved and embossed steel, prepared by a revived and improved Asiatic method, which have excited the admiration of my countrymen, I must express the high gratification I felt in perusing the sketch of Captain Abbott, who, entering Russia during the period of the war between that country and Khiva, and consequently under circumstances of peculiar difficulty, was yet received with as much kindness as every other Englishman; and he left the country, like myself, deeply impressed with a sense of the generous hospitality of the Russian nation.

The third and last work, published in England, upon which I shall now comment, is that entitled, 'Travels through the Alps of Savoy, and other parts of the Pennine Chain; with Observations on the Phenomena of Glaciers,' by Professor James Forbes. Following in the wake of De Saussure, the great natural historian of the Alps, our eminent countryman, visiting the snowy regions of the Alps during several years, and carefully studying their phenomena, was finally led to propose a theory of the formation and movement of glaciers, which, in sustaining some of the leading views of his great master, seems, under certain physical conditions, to be a nearer approach to the truth than anything which had been previously propounded.

In applying to the motion of glaciers the most careful observations and admeasurements, Professor Forbes has clearly established two facts entirely subversive of the theory of their movement by expansion within themselves: first, that the rates of motion near the upper and lower extremities of a glacier are approximately equal; and, secondly, that the motion in winter, though less than that in summer, bears a considerable proportion to it. Hence Professor Forbes infers that gravity must be the primary cause of the motion. A profound mathematician, Mr. Hopkins, of Cambridge, had arrived at the same conclusion, not by a study of the Alps, but by ingenious experiments at his own home, whereby he showed that ice will descend, by the action of gravity,

down planes of very much smaller inclination than that of any known glacier which has been observed in motion; and has thus removed the only serious difficulty which ever existed in the gravitation theory. Whether the component parts of a glacier be analogous to a viscous fluid, as suggested by Professor Forbes, or be made up of loose fragments of ice (the opinion of Mr. Hopkins), which, in advancing, must have all the pliability of such a fluid body, is a question I am not able to decide. Nor can I pretend to do justice to a curious discovery of Professor Forbes, of the laminated structure of ice, as indicated by lines of colour—a structure which may eventually serve to throw light on the crystalline arrangement of rocks.

I cannot, however, take leave of this beautiful and instructive work without saying that, even in strict reference to physical geography, it has strong claims upon our consideration; for, independent of correct drawings of the outline of many peaks and valleys of the Alps, the corrections of Keller's general map of the Pennine chain are most important, whilst the detailed map of the 'Mer de Glace,' and the mountains around Chamouni, is a striking proof of the topographical skill and accuracy of Professor Forbes, without which his reasoning could not have been applied, nor his deductions established. I may here mention that, in revisiting the Alps last summer on his way to Italy, this powerful natural philosopher obtained fresh proofs of the accuracy of his views, which he has since recorded; and I rejoice to learn that his health, which was to some degree impaired, has been greatly restored.

ENGLAND—*Maritime Surveys.*—To a maritime nation like ours, nothing being of greater importance than correct charts, I shall commence my notice of the progress of British geographical labours, during the past year, with an account of the nautical surveys under the direction of the Admiralty, obligingly furnished by our eminent associate, the Hydrographer Royal, Captain Beaufort.

Captain Bullock, of the Tartarus, to whose preceding labours in the river Thames allusion has been made in the Anniversary Addresses of the two last years, is now employed in the examination of the channels leading into the mouth of the river, and those through the Downs, where a considerable change has taken place in the position of the Brake and other banks.

Captain Washington, formerly our excellent Secretary, and now commanding the Blazer, is still employed in the North Sea, the survey

of the southern part of which, already extending over 6000 square miles, has been published. It gives the position of all dangerous banks, and enables the seaman to find his way at night or in a fog, by means of the soundings, of which there are more than 20,000 in the single sheet. Such a submarine survey of the most beaten watery track in the world is a benefit to the seamen of all nations. The survey will be continued by Captain Washington farther to the northward, and towards the entrance of the Baltic; and occasionally he is engaged in correcting the charts as nature changes the positions of the shoals and the directions of the channels. Singular instances of such changes have lately occurred in Yarmouth Roads, through which so many thousand vessels annually pass.

Commander Sheringham, in the Fearless, has completed his elaborate plans of Portsmouth harbour, Spithead, St. Helens, and of that dangerous reef called "the Oars;" and in the ensuing season he will survey Southampton River, and advance towards the Needles. The Oars, or Owers—a rock visible only at neap tides, and on which a light-house is built—is a remnant of the strata of the cretaceous system which, in a former condition of the globe, must have spread continuously from Sussex and Hampshire to the Isle of Wight.

Scotland.—Lieut. Otter has already rounded the N. point of Great Britain, and, now advancing to the westward, will, it is hoped, turn Cape Wrath before the end of the approaching season; whilst Mr. G. Thomas, in the Mastiff, has been for some time engaged in the survey of those two intricate groups, the Shetland and Orkney Islands. The survey of that northern British sea is of great maritime value; for, notwithstanding the construction of the Caledonian Canal, executed at so large a public expense, with the view of escaping from the risks of the northern *détour*, the greater number of mariners, anxious to save the heavy charges of the canal, encounter the dangers of the currents between the Orkneys and the main-land, and of the projecting rocky headlands of that iron-bound coast. So long as no correct triangulation of Scotland existed (and this national reproach has only been removed within these very few years), many of these headlands were inaccurately laid down; and with such very imperfect charts as heretofore existed, we can feel no surprise at the former loss of life, or at the exaggerated estimate of the dangers of the northern passage. However, with the combined efforts of the Ordnance survey, and those of our naval surveyors, the risks and hazards of the Fitful Head will be greatly lessened. Finally, in speaking of the Scottish seas, it is to be observed that Commander Robinson, in the Shearwater, having nearly completed

the avenues to that great commercial arm of the sea, the Frith of Clyde, as well as Loch Goil, is now preparing to proceed along the shores and islands to the Mull of Cantire.

IRELAND.—Commander Frazer, in the Comet, is now completing the survey of the Irish coast from Wicklow to Wexford, and of those proverbially dangerous banks off Arklow, the position and limits of which have never been accurately examined.

Commander Wolfe, having minutely examined the Shannon from Termonbany, and through the Lakes of Ree and Derg, charts of all of which have been published, has recently surveyed the harbour of Cork, from whence he will proceed towards Kinsale and Cape Clear, while another party is preparing for the western shores of Sligo, Galway, and Clare.

The Irish Channel, so much frequented, and where vessels are so often obliged to feel their way, by the alterations of its depth, had long been suffered to remain without a single correct chart of its soundings; but Captain Beechey, in the Lucifer, has now completed a valuable survey of its northern half. The southern portion will be undertaken next summer, and, when finished, will be an invaluable boon to the navigator.

FOREIGN SURVEYS.—*Mediterranean.*—Commanders Graves and Brock, in the Beacon and Magpie, who have for some years past been occupied in the examination of the islands of the Archipelago, the shores of Greece and Asia Minor, and the coasts of Crete and the Cyclades, from which the navigator, geologist, and classic geographer have obtained so much solid information, are now continuing their labours on the islands of Candia and Cyprus. Independently, however, of his maritime survey Captain Graves will ever be remembered by all lovers of natural history and geological science, as the friend who induced Professor Edward Forbes to accompany him during a part of his labours. By dredging the bottom of the Ægean and adjacent seas with Captain Graves, that eminent naturalist, showing us how animals living during the same period of time differ from each other at different depths, has also defined the conditions of sediment and depth at which animal life ceases, and has thus opened a new vista into the hitherto obscure causes for the absence of shells and other organic remains throughout great masses of sedimentary deposit, and their occurrence in certain bands only.

I am rejoiced to learn that, since the return of Professor Forbes from the Ægean, Captain Graves and his officers have pursued these researches with vigour and great success. During the survey of Crete,

in 1843, collections of considerable extent, as well as copious notes and drawings, in zoology, botany, and geology, have been made on board the Beacon: thus developing the natural history of the southernmost European lands, previously so ill explored, whilst the dredge has been actively going at great depths, with the view of completing the observations already recorded, or about to be published, by Professor Forbes.

Azores.—This interesting group of islands, though lying in the homeward track of almost all foreign-going vessels, had never been surveyed till undertaken by Captain Vidal, in the Styx. A correct chart of them will be a great benefit to all navigators, and especially to the West India steam-packets; and there is good reason to believe that the whole will be achieved this season, through his zeal and activity.

Gulf of Fundy.—The number of dangers in this Gulf, and the unusual strength of the tides, which rise and fall 60 feet, render it very desirable to have a skilful survey made of it, as well as of the navigable river of St. John. Some progress was made therein last year.

Coast of China.—Captains Sir Edward Belcher and Collinson, in the Samarang and Plover, without whose zeal and skill, as was well observed by my predecessor last year, the British fleet would never have appeared before Canton, or reached Nankin, are still unravelling the intricate navigation of the coast of China, and are constantly sending home hydrographic information of the greatest importance to our Indian navigators.

While these important labours of our naval officers are carried out in various parts of the world, the Hydrographic Office, under the skilful and scientific direction of Captain Beaufort, is equally active in publishing the results of such surveys. No less than 120 sheets of charts and plans have issued from the Admiralty since this time last year, all of which have been most liberally presented to the Society by the kindness of the Lords Commissioners.

British Charts and Maps.—Besides the maritime charts of the Admiralty, to which I have already alluded, there have been published:—

The last sheets of the Atlas of the Society for the Diffusion of Useful Knowledge, in which our associate Capt. Beaufort has taken so leading a part.

The map with which this series concludes is a geological illustration of England by myself, and therefore I say nothing of it, except that I have endeavoured to prepare it according to the most recent principles of classification, and that from its convenient size and very small price it may be found an useful Vade Mecum for the general traveller.

A sketch of the N.W. coast of Borneo, showing the approaches to

and entrance of the River Sarawak, surveyed by Mr. J. S. Hobbs, commander of a merchant-vessel belonging to Messrs. Melville, Wise, and Co., who have published the chart.

The National Atlas of Historical, Commercial, and Physical Geography, by A. K. Johnston, Edinburgh.

Ordnance Survey.—During the last year the sheets Nos. 88 and 89 of the Ordnance Survey of England and Wales have been published on the scale of 1 inch to a mile, and the engraving of the county of Lancaster has been commenced on the scale of 6 inches to a mile. The survey of the county of Wigton in Scotland has also been commenced on the scale of 6 inches to a mile. Maps upon this extended scale, you are well aware, are of the greatest value in all those tracts where the subsoil contains metallic ores, or coal and limestone.

The town-land survey of Ireland on the six-inch scale is complete, and all the counties are published except those of Limerick, Cork, and Kerry. Among those published last year was the county of Dublin, the publication of which had been suspended to await a special act of parliament for the arrangement and legalization of its territorial boundaries. The engravings of this county are remarkable, among other particulars, from the sheet which contains the city of Dublin being printed from an electrotype plate. This process of electrotype was adopted in the Irish survey for the preservation of original plates, and for the insertion of contour lines, as early as 1840; but the instance in question is noticed as another application of this useful art. The city of Dublin was surveyed and engraved in 1839, but while the publication was suspended numerous local alterations had taken place. In some parts of the map many alterations were required within a square inch, and persons familiar with the process of engraving well know that such numerous erasures, if made in the usual way by scraping the copper-plate and hammering up a new face, would, in work so crowded, have nearly obliterated the whole engraving, the re-engraving of which would have been both tedious and expensive; but the electrotype afforded the means of effecting the object in the neatest manner, by erasing from the "matrix" the exact lines to be corrected, so that the "new plate" became blank in those spots, on which the engraver with the utmost nicety inserted the precise quantity of new work required, and no more. By the same means the "Castle Street" of Dublin, on the five-feet scale, has been brought up to the present state of the town. A copy of each of these sheets has been presented to our library.

The maps which accompanied the late census of Ireland were, by permission of the Government, engraved during the last year at the Irish

Survey Office, and they afford another example of the application of electrotyping process; the outline or topographical basis of towns, rivers, and names being engraved on one plate, as many copies were procured by the electrotype as were necessary to exhibit the different classes of observation; on one the relative diffusion of education, on another of house accommodation, on another of farming stock, and on another the relative density of population.

The facilities which the applications of electrotype now practised on the Irish survey afford for the alteration and renewal of maps from time to time, and the insertion of separate classes of information on successive plates, cannot fail to be of great use to the progress and diffusion of geographic knowledge.

During the last year the valuable addition of lines of equal altitude, or contour lines, which was in progress for the Irish maps, was suspended by the Board of Ordnance, as well as the geology and the topographic memoirs; but the revival of all these works has been recommended by a commission appointed by Sir Robert Peel.

The method of contouring, on which I shall presently offer a few remarks, is so imperatively required in the present condition of Ireland, that it pressed itself on the consideration of the British Association for the Advancement of Science which met in Ireland last summer; and the council of that body lost no time in appointing a committee to communicate with the Government and solicit its renewal. There can be little doubt therefore that, so supported, the order for its continuance will be renewed.

A series of lines of level which cross the island in every direction was brought to a close during the last year; these lines, with the tidal observations made at their extremities, are now in process of reduction. The observations were carefully made at every five minutes during two complete lunations, and as the zeros of all these tide stations are known in reference to each other, the results will be considered interesting to the tidal question generally.

This extensive and accurate system of levels has also an important bearing on physical geography; for when the altitudes of so many points on the coast, and a still larger number in the interior are known in relation to each other, it will only be necessary that our successors should repeat any convenient portion of this operation at a future day, to discover what motion has taken place in that portion of the crust of the earth. A mere glance at these important advances must therefore induce us to rejoice that this department of our science continues to be under the direction of Colonel Colby, and that he is so admirably se-

conded in Ireland by Capt. Larcom. You will not fail to have observed that the highly useful application of the Ordnance Map to separate classes of information, is an adoption of the suggestion made by my predecessor Mr. Greenough in his anniversary address for 1841.

Sir James Ross.—Although, gentlemen, it is well known to you that Her Majesty has been pleased to confer on Captain James C. Ross the honour of knighthood, I consider it a duty publicly to express from this chair the great satisfaction which is felt by the Royal Geographical Society at this act of justice towards Sir James Ross, who in his late most hazardous explorations in the Antarctic Ocean has added another to the many glories achieved by the British navy. The results of the Antarctic expedition being of the highest interest to science, the Government has not been backward in tendering assistance for the publication of a detailed account of the voyage; and they have given 1000*l.* towards the expenses of the undertaking. The botanical part will be under the direction of Sir Wm. Jackson Hooker, and the zoological under that of Dr. Richardson. The magnetic observations are, I believe, confided to Colonel Sabine. The personal narrative will of course be executed by Captain Sir J. C. Ross himself. The work is expected to be ready by the end of the year.

Russia.—*St. Petersburg.*—With the progress of knowledge, a division of labour has become imperatively necessary in various departments of the physical and natural sciences, and on all sides societies have been established for single or monographic purposes. Until very recently, however, few or no efforts had been made to separate physical researches, properly so called, from those of the astronomer; and, remarkable as it may appear, all observations on terrestrial magnetism and meteorology have hitherto been left to men, the chief portion of whose time and attention was necessarily devoted to entirely different subjects. Under the ægis of Humboldt, however, and through his researches combined with those of Hansteen, Erman, Sabine, Ross, Kupffer, and others, meteorology and terrestrial magnetism have assumed a separate and most important bearing. Observations have been steadily carried on in different parts of the world, and those who wish to obtain a conception of the breadth and importance which they have assumed, have only to consult the admirable works of our countryman Colonel Sabine, whether in the Transactions of the British Association, or in his own volume. At the suggestion of Baron Humboldt the Emperor of Russia not only directed magnetical observations to be made at all the astronomical observatories, but also at many other desirable spots within his empire. Following out and developing the project of this great man, the same

monarch has just given his sanction to the formation of a physical observatory—completely distinct from the splendid astronomical observatory of his metropolis—in which all the local observations over his vast empire are to be centralized and reduced, under the directions of that profound mathematician and magnetician M. Kupffer.

In this noble undertaking His Imperial Majesty has set an example which ought to be followed in other countries. At home we have, indeed, to some slight degree, endeavoured to establish a separate observatory for physical science in the Royal Observatory of Kew, and which, if the funds were adequate, would, under the guidance of Sabine and Wheatstone, be of utility and importance. At the same time it is imperative upon me to state, that if all astronomers should imitate our distinguished astronomer royal in the ardent and well-regulated method of observation in terrestrial magnetism which he so successfully carries on at the Observatory of Greenwich, no sort of reflection could be cast upon our country for being behind other nations in this branch of science.

SIBERIA.—*Northern Siberia.*—My predecessor announced to you in his last address that Mr. Middendorf had commenced his journey into Northern Siberia. The objects of that journey have been effected, and we owe to the eminent navigator, our honorary member, Admiral Von Krusenstern, a copy of Mr. Middendorf's personal narrative—a narrative which proves that in this, as in the case of Wrangel, Golowkin, and numerous other explorers, zeal and perseverance, under the most trying circumstances, and courage superior to every danger, are salient points in the Russian character.

The object of the Imperial Academy of Sciences in recommending the journey of Mr. Middendorf was to obtain correct knowledge of a vast region, quite unknown, extending from Turukansk, on the Ienisseï, eastward, to the Khatunga, and northward to the sea. The coast had, indeed, been visited, but nothing was known of the interior of the region, of its productions, and of the limit of organic life in these ice-bound climates. The conduct of the expedition was confided to Mr. Middendorf, and, as no account of the expedition has appeared in English, a few details of it may be acceptable on the present occasion.

The expedition left Turukansk on the 23rd of March, 1843. The party, their provisions, and materials for the construction of a boat, were conveyed down the frozen Ienisseï on sledges, drawn first by dogs and then by reindeer, belonging to the Ostiaks and Samoyedes. Leaving the Ienisseï, and transported with rapidity from one Samoyede encampment to another, over the "Tundra," or frozen marshes, crossing the Piassina, and ascending its tributary, the Dudypta, they reached

the basin of the Khatúnga. Here they met with fewer resources than they expected, and, with the exception of Mr. Middendorf, and his travelling companion, Mr. Branth, they were all seized with a kind of measles, and disabled from working. At this place, on the banks of the Boganida, a tributary of the Khatúnga, Mr. Branth commenced his meteorological observations, while Mr. Middendorf reconnoitred the Khatúnga, down which river he intended to descend in the summer. Here he found no boat suitable for his purpose, nor any wood wherewith to construct one. The people he met with were, moreover, all ill of the same distemper by which his own party was attacked, but these latter, on his return, he found so far recovered as to be able to work; and, having discovered a few trees, a day's journey to the south of their resting place, the party began the construction of a boat of twelve feet keel, an operation of which none but Mr. Middendorf himself had the slightest idea. He now divided his people into two parties, one of which he left under the command of Mr. Branth, on the Boganida, for the purpose of collecting the animals, &c., of the country; and, taking with him the other party and the skeleton of the boat, and eight sledges drawn by sixty-eight reindeer, he started on the 7th of May, in company with some Samoyedes, towards the Taïmyr river, by which he hoped to gain the coast. The tribe which, after various difficulties, he was next to meet with were found to have been attacked by the fatal epidemic of the country, and, with the exception of thirty-five, all had died, and of these survivors all save one were ill. Mr. Middendorf's medical skill restored them; but as, from their illness, the women had been unable to make the fur coverings for the tents, the travellers were compelled to remain from the 15th to the 18th May in a tent but half covered, exposed to a cold of 18° below the freezing point of Reaumur, or —8·5° Fahr.

On the 28th of May, with much difficulty, they reached the Lagota, an affluent of the Taïmyr, on whose bank they arrived on the 2nd of June, and here the individual who had promised them assistance abandoned them. The boat was now completed by means of the planks which formed the bottoms of the sledges. The summer had set in, the river rose, and by the 23rd of June it was free from ice, and the boat being ready was launched on a bright midnight sunshine, under the 74th parallel of N. latitude; and on the 4th of July the party embarked, leaving a man on the spot to attend to the fishing.

From this time commences a series of disappointments and disasters such as few travellers have had to encounter, accompanied by a failure of provisions. In vain they cast their nets for fish. In vain Mr. Mid-

dendorf had recourse to his gun, in a clime where no birds were seen. They now discovered a cavern, which, on the supposition that it was the same mentioned by a previous traveller, "Laptieff," led them to believe that they were only 52 versts from the sea. This inspired fresh courage, and they proceeded northward. On the 4th of August the last biscuit was shared out, and nothing was now to be their fare but a little raw fish. On the night of the 7th the freezing of the pools announced the approach of winter. The coast was not yet reached, and what would not be their difficulties on the return? Perhaps, hemmed in by the ice, far from any succour, they would perish in these dreary regions. Still Mr. Middendorf boldly pushed on. At last on the 12th the coast was reached, and, animated by this success, the intrepid traveller prepared to put to sea, in order to gain a promontory seen stretching away to the east; but adverse winds forced him to put back. The return southward was still more disastrous than had been the journey northward. Time will not allow me to enter into all the details of this hazardous journey; suffice it to say, that, in returning through the Lake Taïmyr, the expedition was caught by the ice, and the boat was run ashore. With the wreck of the boat they constructed a sledge, but had hardly proceeded with it for three versts over the rocks when it fell to pieces. On the 30th of August Mr. Middendorf, worn out with fatigue and anxiety, was taken so seriously ill as to be unable to proceed. Pressed by hunger they were compelled to kill their faithful hunting dog that had been so useful to the expedition. Even the blood of this animal was not disdained, his flesh was divided into five portions, and, thus provided, Mr. Middendorf ordered his four companions to go in search of the Samoyedes in the desert, and, if possible, bring him relief.

Alone and ill, without shelter at the approach of an arctic winter, under the 75th parallel of latitude, Mr. Middendorf remained in this state for eighteen days, during the last three of which the storm covered him with snow, and thus saved his life. At one moment, believing that his companions must have perished, he was horror-struck with the reflection that his own dreadful situation might deprive him of reason. Self-preservation, however, roused him, and, with a little melted snow, mixed with spirit of wine, in which an object of natural history was preserved, as a beverage, and a partridge which he accidentally caught, he was somewhat restored. He then made a little sledge to drag after him, and, converting a portion of his pelisse into boots, he started, and soon after was happily found by one of his party, coming for him with two Samoyedes. On the 8th of October Mr.

Middendorf was again with Mr. Branth and his party on the banks of the Boganida. The sufferings bravely borne by Mr. Middendorf have few parallels in the annals of travelling, and his conduct, therefore, justly entitles him to that admiration which every man must feel for the rare qualities he has proved himself to possess.

The Ural Mountains.—Gold Produce of Siberia.—From the ice-bound country of the Samoyedes let us now turn to the Ural Mountains which separate Europe from Asia, and the rich metalliferous tracts of Siberia.

In his recent work on Central Asia our associate the Baron von Humboldt has placed these mountains before you in a clear light, describing them as composing a meridian chain, which, in common with other ridges having a north and south direction, possesses striking auriferous and other mineral characters. In order to develop my own views of the ancient sedimentary rocks of which the Ural is, to a great extent, composed, and to show how they differ from the accumulations upon their flanks, it was desirable to possess, at all events, a good map of that portion of the mountains which has been colonized by the Russians, and I have, therefore, with the consent of the Council, constructed a map through the aid of Mr. Arrowsmith, which will appear in the second part of the thirteenth volume of your Transactions. This map is chiefly based on that generally known as Humboldt's Berlin map, which was grounded on the observations of Wischnewsky, Schubert, Humboldt, Adolph Erman, and some local maps. But though the Russians have not yet published a complete map of the Ural Mountains, and have not even triangulated the area, parts of this tract have been laid down with much greater accuracy than others. Thus all the Southern Ural, as included in the government of Orenburg, was, by order of General Perovski, formerly governor-general of that province, carefully sketched by the staff officers under General Rakasofski; a reduced copy of this document, presented to me by General Perovski, and others collected from the Russian officers at the different mining establishments, will form the groundwork of my map. It will apply, however, only to the colonized and mining part of the chain, and the countries through nine degrees of latitude, and it is specially to be viewed as developing the great expansion of the Southern Ural from $51\frac{1}{2}^{\circ}$ to $55\frac{1}{2}^{\circ}$ N. lat., which Baron Humboldt has termed the trifurcation of the chain. In this region the ridges expand in a fan shape, but in the central tract (the northernmost of the Russian miners) one dominant ridge only, with low parallel counterforts, is traceable from $55\frac{1}{2}^{\circ}$ to $61\frac{1}{2}^{\circ}$ N. lat. The true northernmost Ural, extending from $61\frac{1}{2}^{\circ}$ to the

Northern Sea, slightly peopled by wild Voguls, Ostiaks, and Samoyedes, and covered with marshes and dense primæval forests, has never been occupied by the Russians, and is necessarily very imperfectly known to geographers. On its eastern flank, indeed, the Imperial School of Mines have, in late years, pushed forward with great difficulty a *reconnaissance* under Captain Strajefski, from the most northern settlements to 65°, where the central chain, or Ural of the natives, was found to be still persistent in its lithological characters and prevailing altitude, the watershed exceeding 2000 feet above the sea, with occasional peaks or groups of much greater height. In the Southern Ural, these summits, as determined by Colonel Helmersen and M. Hoffman, range from 3114 and 3498 feet, in the Irendik and Taganai, to 5071, in the Iremel. In the central portion the chain is much depressed, and the high road to Siberia traverses it at the lowest point. In following it to the north, high peaks again appear in the Katch Kanar 2942, and afterwards in the Konjukofski Kamen, 4796 to 5116 feet. From these, in a general sense, or as a great meridian chain, Humboldt has correctly defined them as ranging far to the south of Orenburg, and as terminating only in the high grounds which separate the Aral and the Caspian Sea, and on the north as reaching the Isle of Vaigatz and the mountains of Obdorsk. Up to this moment, however, it has been a question where the central ridge really terminated upon the north, and whether or not it offered any great lateral ramifications upon the west.

Though no travellers have yet continuously explored these tracts of the chain which lie between 65° N. lat. and the Northern Sea, there is little doubt, from what has been detected in the Isle of Vaigatz, where Silurian and other palæozoic fossils have been found, that the geological system of the Ural is continuous to that point. We know, indeed, from the exploration of Captain Strajefski already alluded to, that the axis of the chain, at least its eastern flank to 65° N. lat., is composed of rocks essentially similar to those of the Ural of the Russian miners, and from that point to the Northern Ocean it is very unlikely, that a chain so persistent in character throughout its course should present any essential differences. In fact, the recent explorations of Count Keyserling, to 66½° N. lat., have shown that the western flanks of the chain (near the sources of the river Ussa) are composed of the same palæozoic rocks which occur in the colonized and mining districts. Again, from the prevalence of orthoceratites, producti, and other fossils, as well as carboniferous matter in their rocks, the philosophic naturalist, Baer, had suggested that the large and lofty islands of Nova Zemlia, stretching out far northward into the Arctic Ocean, are, in their structure, also a

prolongation of the Ural and its dependencies; indeed, a reference to a general map of Northern Asia might lead any one to believe that Nova Zemlia is, in fact, a continuation of the chief or central mass of these mountains.

Recent discoveries have, indeed, induced me to consider this north and south mass as the central member only of *three great bands*, into which the Ural of these northern latitudes unfolds. The eastern limb, radiating to the N.N.E. from 65° N. lat., passes into the Obdorsk Mountains and the great promontory which separates the Gulf of Obe from that of Kara. First explored by Sujeff, under the direction of Pallas, the correct geographical position and altitude of these mountains were only determined by the enterprising and indefatigable geographer Adolph Erman, who fixed their direction to be 35° E. of N., and their loftiest summit to be near 5000 English feet high. Lowering gradually, as it trends to the S.W., this Obdorsk ridge unites with the Ural in 65°.

I am now disposed to consider another line of elevation upon the N.W., as a third range of the Northern Ural. This western prong of the great northern trifurcation is one which has been made known by the labours of Count Keyserling, during the last summer, and will be fully described in the work alluded to (p. 9). It separates from the main Ural, or middle chain, in lat. 62°, trends in a north-north-westerly direction for the space of upwards of 500 English miles, and, exposing a full succession of all the Uralian rocks on the east side of the Gulf of Tcheskai, finally disappears in the rocky headland of Kaninnos. This last-mentioned low range, the chief part of which is called the Timans, and which is separated from the Ural by a vast trough of Jurassic deposits, traverses in its northern part a region occupied by Samoyedes, and extends beyond the limits of the forests. It was, indeed, wholly unknown to geologists, and only known to geographers through old works of the sixteenth century,* till the close of the last summer, when its explorers, Count Keyserling, and his able associate, Lieutenant Krusenstern, son of our valued foreign member, returned to St. Petersburg. Their astronomical observations have corrected the latitude and longitude of many places, and determined the correct course of the Petchora and all its tributaries. The survey of Count Keyserling has further taught us that, forming the western flank of the great valley of Petchora, or north-eastern limit of the great Permian basin, the Timans ridge is so identical with large portions of the Ural that it cannot be dissociated from that chain; whilst from its component

* The Map of this region, engraved upon wood at Nurenberg by Hirsvogel, in 1547, is considered the most ancient map in Russia. See Humboldt, 'Asie Centrale,' vol. i., p. 456.

parts being less metamorphosed than those of the Ural, and also from containing many organic remains, their development throws great light on the true structure of the Ural, anterior to its invasion by eruptive rocks, and also upon the whole series of the palæozoic deposits of Russia.

Such, therefore, is this long meridian chain, which, followed from the high grounds between the Aral and the Caspian to the northern extremity of Nova Zemlia, traverses not less than 592 marine leagues, and which, having a simple or mural character in the central portion of its course, is strikingly marked by fan-shaped embranchments, both upon its northern and southern extremities.*

I have sincere pleasure in thus publicly alluding to the researches in the basin of the Petchora, which have laid open to geographers a part of the continent of Europe hitherto hidden in obscurity. These researches originated in the ardent desire of my friend and colleague Count Keyserling to wipe out the stigma which attached to modern geographers, of having left so vast a region as great a blank upon our maps as the interior of Abyssinia. To the geological portion of the discoveries of my friends and self I will not now advert, simply saying, that as our volumes will soon be placed in your library, you will have full opportunity of studying them; but I beg you to observe, that without a perfect previous acquaintance with the structure of the Ural, it would have been impossible to say that this Timans ridge was what I have pronounced it to be—nothing but a great north-western embranchment of the Ural, which, having a length of 500 miles, is essentially comprised of Silurian, Devonian, and carboniferous deposits, with a few rocks of eruptive character and igneous origin, which in parts have changed the above-mentioned strata into the condition of crystalline or metamorphic rocks. In the Timans, therefore, as on the western flank of the Ural, the palæozoic strata are comparatively little disturbed, crystallized, or mineralized. It is in the centre, and specially in the eastern flank of the Ural, where igneous agency has been so rife, and where the original deposits are only to be detected in shreds and patches, that the great metalliferous accumulations abound, which have rendered this chain so rich and so famous.

Gold Produce of Siberia.—To this subject I wish to point the attention of statists and geographers, for it has already begun to occupy the thoughts of politicians, and may eventually have a very marked influence upon all civilized nations, in changing the relative value of gold as a standard.

* Ordinary travellers, who simply cross the Ural by the high road to Ekaterinburg, where the watershed is at its lowest level, can have but a very imperfect notion of it, and can only compare it in altitude to the Vosges between Metz and the Rhine.

In Russia, as in the Brazils, the great mass of the metals is derived from local detritus or alluvia, usually called gold sand, but for which (as far as Russia is concerned) the term of shingle would be much more appropriate. With very trifling exceptions, all such auriferous detritus in the Russian empire occur on the eastern or Siberian side of the Ural. Slightly known, and near Ekaterinburg only, in the days of Pallas, it was only in the reigns of Paul and Alexander, that these gold alluvia were found to extend in a certain zone to the N. and S. of that locality, throughout 5° or 6° of latitude, and that eventually gold was extracted from them to the annual value of about half a million sterling. Notwithstanding the increased exploration of late years, and many researches in the northern and southern portion of the chain, this quantity has been rarely exceeded, and latterly, the alluvia in some tracts being exhausted, it has begun to decrease. The reign of the Emperor Nicholas has, however, been distinguished by the important discovery, that portions of the great *eastern* regions of Siberia are highly auriferous, viz., in the governments of Tomsk and Ieniseik, where low ridges, similarly constructed to those on the eastern flank of the Ural, and like them trending from N. to S., appear as offsets from the great E. and W. chain of the Altai which separates Siberia from China. And here it is curious to remark, that a very few years ago this distant region did not afford a third part of the gold which the Ural produced, but by recent researches, an augmentation so rapid and extraordinary has taken place, that in the last year the eastern Siberian tracts yielded considerably upwards of two millions and a quarter sterling, raising the total gold produce of the Russian empire to *near three millions sterling!!*

Now if this great increment be sustained during a certain number of years, there can be no doubt, that it will, to some considerable extent, reduce the standard of value, and lead to considerable change in our social relations. The first question therefore is, to what extent is it likely to be sustained? Gold alluvia being but the detritus of veins which once existed in the adjacent rocks, it might be supposed, that in piercing these rocks the miner would find more copious stores of the metal. Experience, however, has taught us, that such is not the fact, and to whatever cause due, it is certain that the veins which rise from great depths in the crust of the earth, are richly auriferous towards their *upper limit only*. Hence it is, that nearly the whole of the ancient surface of rocks having undergone denudation and consequent destruction, the greater quantities of gold are found in the detritus on the flanks of the hills, or in the valleys between them. So long, therefore, as these alluvia are unexhausted, so long may the miner extract from them,

by a cheap and easy method of macerating and washing, the ore which would be obtained at much greater cost from the solid rock. Now, those alluvia having well-defined bottoms, and being of measurable extent, may certainly be exhausted; and the disappearance of gold from all those civilized countries, in whose early days it was abundantly found (even in our own isles), is a proof that such must sooner or later be the case. But how long is it before this period of exhaustion will arrive? When we reflect upon the length of time which the one region of Brazil has continued, I believe with undiminished quantity, to supply modern Europe with its great mass of gold, the opening out of a new El Dorado should teach us to be very cautious in attempting to limit the auriferous capacity of the vast and slightly explored regions of Siberia. The N. and S. counterforts of the great Altai may, in truth, prove to be but the indications of similar spurs, or detached meridian ridges, which may be discovered in many other tracts of a region equal in extent to the whole of Europe. From the researches of the Russian engineers, and from Humboldt and his associates, we learn, that rocks similar to those which are so auriferous in the Ural, reappear in various parallels of longitude along the flanks of the Altai. By a recent letter, indeed, from my friend Colonel Helmersen, the distinguished and successful explorer of the Ural, Altai and Siberia, I learn that his former associate in these countries, Professor Hoffman, has, in his last visit of 1843, discovered a tract in Siberia, in which the very richest gold alluvia occur in a "terrain" exclusively composed of granite and metamorphic schists, the gold being in the latter. Now in the Ural, as in other parts of Siberia, greenstones, syenites, and serpentines seem invariably to have been the agents by which the metamorphic rocks have been rendered auriferous; this discovery, therefore, widens the field of the gold-searchers, and opens out great probable, practical as well as theoretical, results. In truth, Siberia and its adjacent regions may be found to contain another Brazil, where granite also is the great eruptive agent of mineralization and metamorphism.

Count Keyserling also assures me in one of his letters that the discovery of M. Hoffman *relates to an area larger than France*, every part of which seems to be more or less auriferous, and *all the subjacent rocks* (Silurian schists and limestones?) when pounded up and analyzed affording a certain per centage of gold! If this diffusion of gold, through the very matrix of rocks, which is, I may observe, a phenomenon hitherto almost unknown,* be really found to hold good over so vast an area, it

* In my travels in the Ural I learned, indeed, from General Anosoff at Zlataûst, that by a searching analysis, gold had been discovered disseminated in the matrix of some of the *limestones* south of Miask.

imparts a new and most important element to our reasoning, and renders it vastly more probable, that no sort of limit can be set to the increase of the produce of Russian gold. We know also from our enterprising medallist, Adolph Erman, that palæozoic, eruptive, and metamorphoric rocks, similar to those of the Altai and the Ural, extend even to the Alden mountains, not far from the shores opposite Kamtschatka; and if so, why may they not contain the same minerals? Again, we are told by Helmersen and others, that some of the southern offsets from the Altai, which extend into China, are auriferous, and one of them, the Tar-Bagatai, the northern part of which is in the Russian territory, has already proved highly productive. The last fact is of very great importance; for the Celestial empire, which has only just now been partially opened out to European enterprise, may very probably (and I have strong reasons to think that the same classes of rocks extend through Chinese Tartary) prove to be another golden region like Siberia. Even in our own Hindostan, auriferous veins and deposits, as yet, it is true, of no great value, are known at various points from N. to S., and have recently met with a good describer in Lt. Newbold, who strongly urges their further and more scientific exploration;* whilst we have yet to learn, whether, in the progress of civilization, the gold tracts of South Carolina may not afford considerable additions to the metallic wealth of the new world.

But, reverting to Northern Asia, how are we to limit our anticipations of the augmentation of such produce, when it is a fact, that within the last few years only, a tenth portion of the earth's surface (Chinese Tartary and Siberia) has been, for the first time, made known to us as in many parts *auriferous*, and when from one portion of it only, Europe is already supplied with so very large an amount of her chief circulating medium? Well may political economists and politicians now beg for knowledge at the hands of the physical geographer and geologist, and learn from them the secret on which the public faith of empires may depend. Well may even our own government, so deeply interested as it is in this great question, as regards China, stimulate, encourage, and reward our geographical researches, and enable us to reach those tracts belonging to our great ally, who, in a few years, may not only have tea and other natural products, but abundance of gold and other precious metals to exchange for our manufactures.

These, gentlemen, are new and striking features in the polity of nations, and where is the public man who will now deny that some

* 'Journal Roy. Asiat. Soc., 1843,' p. 203.

schooling from ourselves, and our colleagues and brothers the geologists, will not enable him to grapple more effectually with questions so deeply important to posterity?

Caspian Sea.—In a former year, the labours of the Russian professor, Eichwald, on the geography of the Caspian, were spoken of by Mr. Hamilton, more particularly in relation to its ante-historical or ancient condition, and I have now to direct your attention to a valuable recent work of the same author upon the existing "Fauna" of that sea.

Humboldt has indeed brought before the public the whole subject of the Caspian, and the depression of the earth's surface, of which it forms a part, both in his "Fragmens Asiatiques," and in his "Asie Centrale." In the first of these works it was assumed, according to the barometrical observations of M. Parrott, that the level of the Caspian Sea was 300 feet below that of the Black Sea and the Sea of Azof. The trigonometrical levellings of Messrs. Fuss, Sawitsch, and Sabler, since undertaken by the Imperial government, and most accurately calculated under that profound astronomer M. Struve, have shown that the depression was very considerably overrated, and they have finally reduced it to 83·6 English feet.*

The last year has brought another champion into this field of difficult research, in the person of M. Hommaire de Hell, a French engineer, who endeavours to reduce the level to little more than 60 English feet. This gentleman had the advantage of being accompanied by his very accomplished lady, who, whilst her husband was engaged in the laborious duties of his survey, made sketches of the steppes and their Calmuck occupants, and has graphically and elegantly described the manners of the people, in a splendid work now issuing from the press, entitled, "Les Steppes de la Mer Caspienne." A map of the whole of the South of Russia, by M. de Hommaire, not yet published, will accompany the work.

But to return to our subject of the level of the Caspian. The measurements of M. Hommaire, from the Sea of Azof to the Caspian, were made by very numerous levellings which passed continuously through the lower country, in which he profited by the evidences afforded along the course of the rivers Kuma and Manitch, for an account of which I refer you to his explanations given in the bulletin of the Geological Society of

* Until the winter of this year the calculations were not completed; but as M. Struve has obligingly communicated the results to me, the proofs, upon which the level of 83·6 English feet depends, will be published in our 'Transactions.'

France.* Yet although M. Hommaire is an engineer of great merit, and though the Geographical Society of France has awarded the half of its first prize to him, for his travels and levellings, undertaken amid many privations, and in a trying climate, I cannot assent to a belief in the greater accuracy of his results, than those of the Russian mathematicians above alluded to. The erroneous results in the barometrical estimate of M. Parrott were accounted for by the multiplication of small errors in calculating from station to station; and he himself suggested the method by which the whole question should be finally set at rest: hence took place the consecutive series of levellings from the Sea of Azof, by Stavropol and Georgiefsk, to the Caspian. Few means, indeed, could have been better devised than *the four independent admeasurements* employed by the able mathematicians Fuss, Sabler, and Sawitsch; and as their results, which agreed very closely, are thoroughly relied upon by M. Struve, and have been adopted by so great an authority as Humboldt, most geographers will, I apprehend, adhere to them.

But even if the Caspian be ultimately shown to be a few feet less depressed, it is now generally admitted that it is considerably lower than the Mediterranean: and then arises the question what has led to this difference of level? In attempting to solve this problem, as well as others of the same kind (of which the Dead Sea is by far the most notable example), the geographer must, I apprehend, consult the geologist. The first point to ascertain, then, is, what was the extent of the Caspian in its most ancient state; and what traces has that sea left of the area which it occupied? Before the fact of the depression was known, and seeing that the Caspian, Aral, and Black Seas were only separated by low steppes, often saline, and here and there covered with shells of animals similar to those now living in the Caspian, Pallas imagined, that in the earliest historical times the three seas must have been united in one mass of water, which also covered the wide steppes N. of Astrakhan and large tracts to the N.E. The western barrier, which was supposed to have held up this vast mass of water, was imagined to have been broken through by a great convulsion, which formed the Straits of the Bosphorus, through which the superabundant waters having been poured off, large low tracts were drained, and the inland seas reduced to their present separate limits. This view, which is more or less adopted by other writers, was subsequently developed at great length by General Andréossi, who, in his work upon the Bosphorus, took great pains to establish the fact that this disruption gave rise to one of the local deluges of Greece.

* Anno 1843, p. 263, 269, 322, and 366.

Believing, with these authors, in the former higher level of the Caspian, and its escape by the same channel, M. Hommaire conceives it to be more natural to suppose that the present depression of this sea is due to a diminution in the supply of the water furnished by its great feeders the Volga and the Ural, than to a sinking of its bed. To this point, which is however a mere nothing in the general question, I will presently revert.

In our endeavours to solve this curious problem, let me first observe that we must carefully separate the ancient geographical, or rather geological, conditions from modern geographical changes; or the records of primæval nature from those which are truly historical. What then are the facts? Are we to infer the former wide diffusion of the Caspian from the existence of salt steppes alone? Certainly not; for in some of these with which I am personally acquainted, as in that N. of Astrakhan (the greater part being below the level of the ocean), it is well known that the salt rises in springs from subjacent strata of high antiquity—strata formed before the accumulation even of the secondary rocks.*

Other saline deposits in these steppes may, indeed, have been accumulated in subsequent tertiary periods; but as rock-salt and brine-springs, to whatever cause originally due (and igneous action upon marine residue may be called for to explain their formation), exist in all parts of the world, and in strata of very different age, it is obviously impossible to look to the presence of intensely saline deposits as a satisfactory explanation of the former extension of the Caspian Sea, which is only of a brackish nature. But the fauna of that sea, as we learn from Eichwald, is very peculiar; and, comparing things aquatic with things terrestrial, we may fairly say that the creatures which inhabit the Caspian are as unlike those which live in the Mediterranean and the ocean, as those which now exist in New Holland differ from those of other continents. Its brackish waters, which even now are drunk by the savage Turkoman, along a portion of its eastern coasts, where no fresh springs occur, have alone afforded to the researches of the naturalist the small number and variety of about thirty species of shells, with fishes for the most part having fresh-water forms; whilst hundreds of species prevail in the Mediterranean and the ocean. Now these shells, differing entirely from those of the ocean, are all of species which are found in brackish water, and many of them are common to pure freshwater lakes and rivers.

* This point is explained in 'Russia and Europe, and the Ural Mountains,' now in the press, vol. i.

Among these, certain Mytili and Cardiaceæ, some of which ascend far up the Volga and the Don, with a few univalves, most of which are eminently of lacustrine and fluviatile characters, constitute the striking features of the Caspian Fauna.* Of these several species are found, not only strewed about upon the sandy surface of the lower and desiccated steppes, but also impacted in solid limestones, which at one period must have formed their shores. Now some of these limestones, so loaded with certain species peculiar to the Caspian, rise to heights of 200 and 300 feet above the Sea of Azof, of the Black Sea, and the Caucasian steppes; and in the great and elevated plateau of the Ust-Urt, which separates the Caspian from the Aral, they attain the elevation of upwards of 700 feet above those waters, and are spread far and wide over the desolate tracts extending towards Khivah.† Are we then to infer that such shells, entirely distinct from any oceanic forms—undoubted remains, as they are, of a former Caspian—indicate by their present position the real level at which that inland sea once stood? Such has been the hasty conclusion even of intelligent travellers; but if the summit of the Ust-Urt really represented the undisturbed bed of the Caspian, that sea must have stood at 800 or 1000 feet above its present level; and, if so, it must have submerged all north-western Europe, with the exception of the mountain chains! That such, however, has never been the case is too evident; for neither the tracts to the W. of the Black Sea, nor any of the adjacent low countries to the N. or S. of it, present traces of Caspian deposits. The truth then seems to be, that in the later part of the period which geologists call tertiary, there existed an inland Mediterranean, of brackish water, probably of greater extent than the present Mediterranean, which was entirely shut out from the adjacent seas by slight inequalities of land, since removed by certain oscillations of the surface. This condition of things was next disturbed by other vibrations, by one of which a large part of the ancient bed of this great inland sea was thrown up into the plateau of the Ust-Urt, and thus was the Aral separated from the Caspian; for all the tract between them, lofty as it is, was once the bed of an united and continuous sea—as proved by the equable distribution of the *same* peculiar organic remains.

After this separation from the Aral, the Caspian remained connected

* I may here give a familiar example of the hardy and persistent nature of one of the most common of the mollusks, now living in the Caspian, the *Mytilus polymorphus* (Linn.). This shell was formerly supposed to be peculiar to the Caspian and Black Seas, and the tributary rivers, in which it was known to ascend for many miles above their mouths, when by accident some living specimens were found in our London Docks, to which they had been transported in the timbers of Russian vessels: from that locality they have since extended themselves into the interior of England by the Croydon and other canals.

† See Abbott's Journey.

with the Sea of Azof and the Black Sea, and probably spread over all the lower steppes of Astrakhan and the countries between Asterabad and the Oxus. Another period of elevation occurred, which, in desiccating these lower steppes, left the Caspian of the present day, as the small residue of the once mighty Aralo-Caspian Sea.

That such grand mutations must have been carried on, there can exist no doubt; for, independent of the fact that beds of limestone, marl, mud, and sand, containing the same peculiar shells, now lie *at such very different levels*, we have in the adjacent chain of the Caucasus the most distinct proofs of great outbursts of eruptive and volcanic matter, within the very period to which I refer; and the extravasation of such matter, and the upheaval from below of great masses, formerly submarine, must necessarily have been accompanied by correspondent depressions. Hence the Aral, Caspian, and Black Seas (all of which we can rigidly demonstrate, by peculiar organic remains around them, to have been formerly one sea), have been separated and left at different levels. Other similar phenomena in Europe are to be explained upon the same principle.

Around the shores of our own islands, as well as on the coast of Norway and Sweden, beds of sea-shells, of existing species, lie at various levels, from 50 to 600 feet, above the present ocean; and these are now confidently referred, not to depression of the ocean from different levels, but to successive elevations of the land.

In the application of this reasoning to the chief outlines of the territories of the Caspian and the Aral, I hope in a very short time to publish, with the assistance of my colleagues, some satisfactory explanations, which I would beg you to consult before the next anniversary; trusting that you will find in them a valid support of my opinions, and a proof that, without duly interrogating nature after the manner of geologists, it is idle for the geographer to attempt to connect traditional history with appearances upon the surface. It is only in the hands of such antiquaries as Humboldt—men fully alive to the weight of geological evidence—that the changes which have really taken place within the *historic era* can be rationally evolved. One thing we can safely assert, that such historical changes are as zero compared to the grand revolutions to which I have adverted. This remark brings me naturally back to the point in the statement of M. Hommaire, that the Volga and the Ural rivers are now contributing much less water to the Caspian than they did in the earlier historical period. Of this I have no doubt; for, by the destruction of her great forests, the diminution of her marshes, and the progress of culture, it is quite evident, that the volume of water carried down by the fluvial systems

of Russia must be infinitely smaller than in former times. If, then, the present loss of water by evaporation be assumed to be neither more nor less now than formerly, it follows that the Caspian must be gradually subsiding. The standards fixed upon the rocks near Derbend, at the suggestion of Humboldt, will go towards deciding this question; but as that locality is upon or near a line where the surface is penetrated by gases and mud volcanoes, and may therefore be presumed to be somewhat unstable; the opposite shore of the sea, Cape Tük Karagan, for example, or the Russian fortress of Novo Alexandrofsk, which are far removed from all such disturbing agency, might be more satisfactorily appealed to. The pestilent climate, however, of the region, and the uncivilized condition of its inhabitants, render it very difficult of access to men of science; and many years may elapse before we are provided with more accurate data than have already been furnished by Humboldt, Eichwald, Göbel, Felkner, and Hommaire.

There is still another subject connected with the Caspian, concerning which there exist differences of opinion. From the evidences alluded to, as well as from the nature of its inhabitants, I have been led to infer that, *on the whole*, the Caspian is less saline than the ocean; but M. Hommaire contends that it contains more salt, and thereby fortifies his theory of the gradual diminution of this sea by evaporation only. Having already shown that such diminution cannot be accounted for without an appeal to other and very different causes, I must leave this question of the less or greater quantity of salt to be decided by an accurate analysis of the water taken from different parts of the sea; in some of which, at great distances from the mouths of the Volga and Ural, an excellent chemist, Göbel, has shown that there is less salt than in the ocean. After all, I beg to ask if the portions of the sea which are highly saliferous may not derive their properties from springs, proceeding from masses of rock-salt, like those of the adjacent steppes, which, as before explained, are wholly independent of the present or former Caspian.

Baltic Sea, diminution in the height of its Waters.—From the south-eastern limits of Russia let us turn for a moment to the north-western. Major L. Beamish, F.R.S., read a paper at the last meeting of the British Association on this interesting subject, and from that gentleman's account it appears that, since the year 1841, the level has continued to sink along the Swedish coast. As the level of the North Sea does not alter, the apparent depression of the waters of the Baltic can be attributed only to an elevation of the land, which indeed has been proved to take place by the observations of Von Buch, Lyell,

and many others. The fall of the water, or rather the elevation of the land, is said to take place fitfully, and to be different in different parts of the coast. It is probable, however, that in some exceptional cases these so-called paroxysmal elevations and depressions may have been due to other causes than the rise of the land; thus the seasons effect a difference in the level of the Baltic, as in all other tideless seas, which receive in the spring a great accumulation of water from the melted snows of the basins which send their waters to it. The prevailing winds also change the level along the coasts; and, lastly, as has been shown by Schulten in the 'Mémoires de l'Académie des Sciences de Stockholm' for 1804, the irregular rise and fall of the Baltic may be explained upon the same principle as the phenomenon of the *seiches* of the Lake of Geneva, described by De Saussure, viz., by the unequal pressure of the atmospheric column, as shown by the barometer at the times of the oscillations.

DENMARK.—In this kingdom some very important labours in geography and its cognate sciences are going on. In the year 1843, the Government published the 7th part of the Statistical Tables of the country. In the same year the Royal Society of Rural Economy published the 16th, 17th, and 18th parts of the Description of the Danish *Amts*, or shires, principally with reference to agriculture, viz., Odense Amt, by Mr. Hofman Bang; Skanderborg Amt, by Mr. Schytte; and Holbek Amt, by Mr. Hasle. Bergsoë's Statistics has been continued by the publication of the 2nd and 3rd Numbers.

The Meteorological Committee of the Society of Sciences has received meteorological observations not only from several places in Denmark Proper, but also from Reikiavig in Iceland, Godthaab in Greenland, and Christiansborg in Guinea.

Professor Schouw has given a view of the geographical and historical relations of the Italian heaths and vacciniums; and Mr. Folbe has communicated to the Society of Sciences an account of his works on the northern coast of Africa, with reference to ethnography, topography, and archæology.

In the year 1843 the hydrographic survey of all the Danish coasts and seas was completed; and before the end of the year the Hydrographic Office published 'The Danish Pilot,' a complete nautical direction for all those parts of the coast of Denmark, and the adjacent coasts of Sweden and Germany. The Hydrographic Office also published a chart of the *Sleeve*, engraved on steel, and another of the S. entrance of the Sound, with part of the Baltic. A chart, completing the 'Danish Hydrographic Atlas,' is in the hands of the engraver.

My friend Professor Forchhammer, the author of the excellent geological map of Denmark, has discovered a large bed of upper green sand near the little town of Kiöge—a discovery which explains both the formation of the deep bay of Kiöge, between the flinty chalk of Steon's Klint, and the hard limestone of the vicinity of Copenhagen, and the existence of a great number of very rich springs at those places, which we now know to be the boundary of the green sand-bed.

The Society of Northern Antiquaries continue their important and highly interesting labours with unabated vigour; and they are hailed with much satisfaction by the geographer. In pursuing their honourable task of illustrating the antiquities of Northern Europe, they have lately published the historical monuments of Iceland and of Scandinavia. The following also have been amongst their most recent contributions in this department of science:—

Danish Books.—The first volume of the 'Historical Monuments of Iceland' (*Islendinga Sögur*); or the original writings from whence are taken the history of Northern Europe and America, and particularly that of Iceland, from the ninth to the fourteenth century. This volume, edited by John Sigurdsson and Charles C. Rafn, with an introductory examination by Finn Magnusen (the former one of our corresponding and the latter one of our honorary members), is almost exclusively geographical. It comprises two works by the oldest of Icelandic historians, a clergyman of the name of Are Thorgilsson, surnamed *Frode*, or the Learned (born in 1068, died in 1148), viz. 'Islendinga Bok, or Schedæ de Islandiæ;' and '*Landnamabók*, or Liber originum Islandiæ,' to which the first named work is to be considered as a prodromus. Here the first voyages of discovery are mentioned as undertaken partly from Denmark, partly from the Faroe Islands and Norway, as well as the emigration of the Northmen to Iceland, and several other countries, occasioned principally by the wars of conquest of Harold Harfagre against the petty kings of Norway, which ended in the subjugation of the whole of that country. Iceland was discovered, according to the latest investigations, in the middle of the ninth century, by Gardar, a Dane of Swedish extraction, who lived in Sealand; and the first settlement of the country was commenced in the year 874, by a Norwegian named Ingolf, who established himself at Reykiavik, and it is stated that the country was completely settled during a period of sixty years. In the above-mentioned work an account is given of the settlement of Iceland by the colonists (Landnama-menn), together with their genealogies; and an exact statement of that particular district which each of them took possession of, and which they again partly distributed, in

different ways, to their fellow-travellers or inferiors. There is scarcely any country that can produce such a work respecting its first settlement as the 'Landnamabók.' The colonies established by the later Europeans in other parts of the world, particularly in America and Australia, and which have since become so powerful and important, may probably undertake similar works, in which case the one just mentioned may, in certain respects, be recommended as a model. The volume is illustrated with four plates, with fac-similes of the MSS. or parchment that have been used, by a map of ancient Iceland in the year 1000, by registers, and by a complete geographical index.

The third volume of the 'Historical Monuments of Greenland' (*Grönlands Historiske Mindesmærker*), containing extracts of the annals, together with diplomas respecting Greenland—a complete collection of geographical accounts, from the middle ages, relating to Greenland, treated in a similar manner to the first two volumes of Finn Magnusen and Charles C. Rafn. In the present work are contained instructions for the course to be taken by vessels going to the polar land, extracts from ancient Geographies respecting Greenland, descriptions of the country, &c., and a contribution to the knowledge of the physical qualities, products, and curiosities of the country; a description of the summer abodes of the Greenlanders in the arctic regions of America; contributions to an illustration of the jurisprudence of the ancient Greenlanders; an account of voyages and travels from 1385, by Björn Einarsson and others. There are, moreover, the voyages of the brothers Zeno, with an introduction and explanatory remarks by the late James H. Bredsdorff; and two articles by Dr. Pingel, who has lived and travelled for a long time in Greenland, viz. a view of the most important voyages that have been undertaken in modern times from Denmark and Norway, in order to re-discover Greenland, which had been lost sight of for many generations, and again to fix establishments there; an antiquarian chorography, partly founded upon the accounts of the voyages and antiquarian researches that have been undertaken in the largest fiords of Greenland, under the direction and at the expense of the Society of Northern Antiquaries. Next follow a view of the ancient geography of the country, founded upon ancient chronicles, and illustrations of the ancient buildings of the country, from the period of its first settlement. As a more complete illustration of the whole subject, and for the greater facility of research, there are affixed a list of the bishops; a chronological, historical, geographical, and antiquarian index; twelve plates; besides two maps of the travels of the brothers Zeno; delineations of Greenlandish seals; ground-plans of the ruins at Ikigit,

Tessermint, Igalikko, and Kakortok; a view of the ruins of the church at the last-named fiord; delineations of the inscriptions in Runes and Latin letters, which have been found in Greenland; and two maps, which I shall presently mention.

A new and enlarged edition, in French, of Charles C. Rafn's 'Memoir on the Discovery of America by the Scandinavians, in the tenth century,' illustrated with nine engravings on steel, partly founded upon the same author's work, 'Antiquitates Americanæ,' published by the Society in the year 1837, and partly upon the elucidations which have been effected by a committee of the Society for the Ante-Columbian History of America.

'The Annals of Northern Archæology:' the volume for 1842 and 1843, with ten plates. In the year 1842 the Society established a committee for investigating the ancient relations of the Scandinavians with Asia. One of the objects to which the Society has begun to direct its attention is the number of oriental coins which are frequently found in Scandinavia, particularly in Denmark and Sweden, and even some single ones in Iceland, whereby the voyages and commercial intercourse of the northern nations in past times acquire a very important elucidation. The greatest part of this volume consists of four treatises, by the Rev. James C. Lindberg, A.M., on considerable discoveries of this sort of coin from the eleventh century, and partly of Anglo-Saxon and other occidental coins from the same period.

The Society's Memoirs ('Mémoires des Antiquaires du Nord'), the volume for 1840-1843. Nicolas L. Westergaard, a member of the Society's Asiatic section, after having published a work entitled *Radices Linguæ Sanscritæ*, with a linguistic object, set out on a voyage to India and Persia, where he has already made acquisitions for the enrichment of science. To this volume he has contributed the first section of a grammatical view of the connexion between Sanscrit and Icelandic. Of the rest of the contents of this volume I may mention an account, by Henry R. Schoolcraft and Charles C. Rafn, of a Runic inscription found in Virginia (a notice of which, with a figure, is given in vol. xii. of our own Journal); and accounts of antiquarian discoveries in Massachusetts, by Thomas H. Webb, Esq.

The work, 'Scripta Historica Islandorum de rebus gestis veterum Borealium,' contains a Latin translation, by the Rev. Sveinbiorn Egilsson, D.D., of the historical Sagas relating to the events in Scandinavia after the inhabiting of Iceland. The Society has now published 35 volumes, comprising the original edition, *Fornmanna Sögur*, and two translations: so that there now remains only the 36th, viz. the

12th volume of the Latin series. This volume, which is in course of preparation, will, like the 12th of the text, contain a chronological view, and a complete geographical index, which, compiled for this voluminous *Cyclus*, may be considered, if not as a complete old northern geographical lexicon, at least as the most essential part of such a work.

A Historico-Topographical Committee is established in the Society for the purpose of receiving and arranging, illustrating and elaborating, those accounts and contributions which may be collected for the historical description of Denmark, and to provide for their preservation in the historical archives of the Society, in order that they may be published. The Committee have issued a programme of its intended labours, and published an historical description of the parishes of Snodstrup and Olstykke, in the northern part of Sealand, illustrated by an antiquarian map. Several similar maps of remarkable districts in the kingdom are under preparation, to be kept in the archives, and published as circumstances permit.

Danish Maps and Charts.—The Society has published a new edition, by Charles C. Rafn, of his general chart, exhibiting the discoveries of the Scandinavians in the arctic regions and America, in the tenth, eleventh, twelfth, thirteenth, and fourteenth centuries; and also of the same author's special map of Vinland, the principal seat of the ancient Scandinavian settlements in North America.

A map of the district of Julianehaab, in the S. of Greenland. This is a new and correct edition of the map, which was formerly published by the Society in Rafn's 'Antiquitates Americanæ,' and was composed, by Captain W. A. Graah, R.N., from such materials as could then be had.

A map of that part of the district of Godthaab, in Greenland, which is thought to have been the site of the western settlement of the ancient inhabitants (Vestribygd), viz. Baal's River, with the adjoining fiords, and Amaraglik, composed by Lieut. C. Möller, subsequently appointed inspector of the northern part of Greenland, and who, at the expense of the Society, has travelled over several of the fiords of this district. Both these maps may be considered important contributions to the modern geography of Greenland, though they are properly to be regarded as antiquarian maps, since all the ruins of European buildings which travellers have met with are marked on them with appropriate signs, so that it may be clearly seen how considerable and how extended the habitations were in former times.

A map of ancient Iceland, with its divisions into large jurisdic-

tions—the so-called *Thing*, or court of justice—from about the year 934 to 1000, for the most part composed after, and principally for the illustration of the before-mentioned *Landnamabók*, but previously made use of in a former edition of Rafn's 'Antiquitates Americanæ.' The changes during the subsequent period were so inconsiderable that this map may be used for all the *Saga-cyclus* until its close in the fourteenth century. Even for modern and the latest times it is not useless, as the places now most remarkable were already so in former times; and generally the great majority of the names applied here are yet found to belong to well-known mountains and mountain passes, valleys, promontories, bays, fiords, rivers, lakes, hamlets, and farm-houses. Above all, the ancient names of places in Iceland, as well as the language itself, are better preserved than probably in any other country in the world.

Closely connected with the Society of Northern Antiquaries is the Literary Society of Iceland, which labours to promulgate the modern literature of that country. The Danish Government having, in the eighteenth and nineteenth centuries, had the charts of the coasts of Iceland published, this Society, notwithstanding its limited means, has had the interior of the country measured, and particular maps made of the various parts. During the summer of 1831, an Icelander, Biorn Gunnlaugssen, a man of great ability in this vocation, began the task, and continued it every summer till 1843, when he finished with the jurisdictions of Stranda and Isafiord. The King of Denmark, who takes a lively interest in all matters relating to Iceland, has granted pecuniary assistance for the reduction and engraving of the maps, which will be confided to the direction of Major Olsen. Four maps are to be published: the two which comprise the S.W. and S.E. quarters are expected to be finished and to appear in the beginning of next year.

To this must be added another undertaking, which is also considerably advanced, viz. a complete physical, topographical, and statistical description of Iceland, by the same Society. Applications were made to all the clergy in Iceland, the result of which, added to the rich collections that the archives contain, form a great mass of materials for the projected work, the physical part of which (the first to be published) will be by the naturalist, Jonas Hallgrimsson, and who has for this purpose travelled over the greater part of the country.

Belgium.—*Maps and Charts.*—With the exception of the maps and charts prepared at the celebrated establishment of M. Vandermaelen at Brussels, very little is published in Belgium; but the extent and resources of that great institution are found amply sufficient for the production of every kind of cartographic work. The zeal, talent, en-

terprise, and liberality of M. Vandermaelen are such, that few countries can boast of a greater number and variety of maps of its own territory than Belgium. Special maps are perpetually issuing from his presses, for every purpose of geography, history, statistics, and the several branches of industry, independent of general maps of Belgium and of other countries. To enumerate all that has been done, and is still doing at M. Vandermaelen's establishment, would far exceed the limits to which I must of necessity restrict myself. I shall, therefore, merely mention a few of the maps which have been published since our last Anniversary meeting :—

A map of Central America, by M. N. Dally, in four sheets ; ' Mappa Chorographica da Provincia de S^a^. Catharina,' by Major Van Lede ; a Cadastral Communal map of Belgium, published, with special approbation of the Government, under the direction of the Inspector of the Cadaster ; a separate atlas for each *commune ;* a map of Belgium on the scale of $\frac{1}{300,000}$, in one large sheet, with the names of all the communes, the railroads, ordinary roads, canals, &c. ; a cantonal map of Belgium, with all necessary details ; a historical map of Belgium of the middle ages ; an ecclesiastical map of Belgium ; a map of the country between the Sambre and Meuse ; the cadastral maps in sets, differently coloured, for the use of the different administrations.

The whole of the above, with several railroad and other maps, except the two first mentioned, are from M. Vandermaelen's Geographic Establishment, in which, moreover, experiments are continually made with a view to the greater perfection of cartography.

Surveys.—The grand survey for M. Vandermaelen's topographical map of Belgium is still going on ; besides which,

The country is undergoing a geological survey by the distinguished geologist M. Dumont, already so well known among men of science for his geological map of the country around Liege. The construction and engraving of this map have been, by a royal ordonnance, confided to M. Vandermaelen.

This geographer has also undertaken a special map of the levels of Belgium, in nine sheets, on a scale of $\frac{1}{160,000}$. The levelling operations have been confided to M. Saus of the department of the *Ponts et Chaussées.*

In announcing his intention of following up his mining and commercial map of Belgium (' Carte Minière et Industrielle'), by a similar map on a general scale, intended to present, at one view, all the branches of industry which exist in Europe, this indefatigable geographer has forwarded to me, for distribution among British geographers, printed

tables of inquiry, requesting us to insert therein any knowledge we may possess of the manufactures of animal, vegetable, and mineral substances, and of the various productions of man in any European locality; and, in distributing them, I trust you will respond freely to inquiries which attest the zeal and intelligence with which M. Vandermaelen is pursuing his highly useful career.

M. Blondeel van Ceulenbroeck has returned to Brussels, from his explorations on the Nile and in Abyssinia; and M. Verheyden has lately been despatched to Mexico by M. F. Vandermaelen, brother to the geographer, in order to collect objects of natural history, as well as scientific and geographical information.

France.—In France nine additional sheets of the great map of that country have recently been published, viz., Dijon, Orleans, Cherbourg, Mortagne, Lisieux, Beaugeny, St. Cloude, Belley, and Chalon-sur-Saone; six more will shortly appear.

The maps of Algeria, of which, through the liberality of the "Ministère de la Guerre," we possess a copy, have, since their publication, been greatly improved, and we are promised a copy of the new edition, in addition to a general map of that part of Africa which Colonel Denaix has just sent us.

That officer has also published a map of the Roman empire, to accompany a volume containing the 'Itinerary' of Antoninus, the Peutingerian tables arranged as itineraries, the various Peripli of the ancients, &c. Colonel Denaix has been many years employed on this great work, which will be invaluable for the study of ancient history. He has presented a copy to the Society.

To the above must further be added, by the same indefatigable geographer, a map of Marcian, of Heraclea, and a map of Turkey in Asia, and Persia, extracted from a large work, on which Colonel Denaix has been long engaged, and for which he has collected very numerous materials. These maps he has also been so kind as to present to the Society.

The general map of Greece, in twelve sheets, by the officers of the French État Major, is in a very forward state; nine sheets are finished, and it is expected that the remaining three will be terminated next year. The Dépôt Général de la Marine continues its activity, and we learn by the bulletin that from 1842 to December, 1843, they had published ten charts and plans of the northern coast of France, eight of the Mediterranean, eight of America, three of roadsteads and islands of the Great Ocean, and fourteen of parts of the Indian Ocean, besides six nautical memoirs.

From the same bulletin we glean that a greatly improved map of Arabia has been prepared conjointly by Messrs. Chedufau and Mari, officers in the service of Mehemet Ali, and Messrs. Ferret and Galinier of the French État Major. These gentlemen have severally had excellent opportunities, both from personal observation and information, of adding to our knowledge of the mountain chain of Yemen and the Hedjaz.

From the Anniversary Address delivered by M. Berthelot to the Société de Géographie de Paris, it appears that M. Mallet of the corvette the *Embuscade* has obtained important hydrographic details of the group of Wallis Islands, and of the passages into the several mooring grounds.

M. Adolphe Delessert has published his 'Voyage dans l'Inde, exécuté de 1834 à 1839.' This work, besides an account of the continent of India, contains some interesting details on Prince of Wales' Island, and also some notions on Singapore and Samboangan.

A translation of a portion of Mr. Horace Hayman Wilson's account of Moorcroft and Trebeck's travels in India has been lately published in French by M. O. Mac Carthy.

Dr. Robert is, we believe, still travelling in Upper India. The route he has marked out for himself is very extensive, and if, as we hope, he succeeds in accomplishing his undertaking, he will clear up some doubtful and important points of Oriental geography.

M. Sainte Croix Pajot is about to undertake a journey in South Arabia, which country he intends, if possible, to traverse in its whole extent, between Yemen and Muscat.

M. Hue, a French missionary, is travelling, it would appear, in disguise in the interior of China, and much valuable information may be expected from his adventurous undertaking.

M. Baldus, also, a missionary residing in China, has sent home to France the results of his observations in a correspondence with the superior of the congregation of St. Lazare. These communications, however, relate chiefly to the manners and morals of the Chinese.

It would appear, from the recent edition of a Chinese map lately sent to Paris, that the mouth of the Yellow River has shifted to the enormous distance of 125 leagues from its former position, when the map was originally constructed, in the eighteenth century, by the Catholic missionaries; and M. Biot, who has written learnedly upon this subject in the Journal Asiatique,' is of opinion that analogous changes may have taken place in many other great rivers, but that the amount of such changes is unknown, from the want of historical annals.

M. Le Comte Jaubert has lately published, in two handsome volumes, an account of the travels in the East of the lamented M. Aucher Eloy; these travels include Greece and the Archipelago, Turkey, Egypt, Syria, Asia Minor, Galatia, Armenia, Azerbijan, Mesopotamia, Persia, and the country of the Bakhtiari, Bander Abassi, Muscat, and several parts of Southern Arabia. M. de Jaubert has accompanied the account of the traveller's labours by a just eulogium of the traveller himself.

Captain Haines's account of his surveys of the coast of Arabia, contained in our Journal, has lately been translated into French by M. Passama.

The occupation of Algeria by the French has been productive of a fresh accession of geographical and other knowledge of that portion of Africa. Besides the maps already published by the Dépôt de la Guerre, and which are constantly being improved, various memoirs have appeared in different French publications. Among others I may mention a description of the Algerian Sahara, by M. Ismaïl Urbain, published in the 'Revue de l'Orient;' an account of the Roman antiquities of Oran, and of the ruins of Tiaret, published in the 'Spectateur Militaire,' &c.

In the Bulletin of the Geological Society of France will be found an able memoir on a very interesting subject of physical geography, by M. Angelot; it is entitled 'Researches on the Origin of the Saltness of various Lakes existing in the depressions of the Soil of the Continents of the World, and particularly of that of the Dead Sea,' &c.

M. Jomard, we learn, is still actively continuing his collection of ancient maps, a work of great interest, whether as regards history or comparative geography.

M. Desjardins, we are informed, has contrived a plan of representing the objects of geographical science in such a way as to leave a more vivid impression of them on the mind of the student. Should he have succeeded, he will have done good service.

The first volume of a work by M. Fontaine, Vice-Consul of France at Bussora, is producing a considerable sensation in Paris, and will most likely soon appear in an English journal. He has had great opportunities of becoming acquainted with the different nations of the East, and has made the geography of some parts of the country his peculiar study. He has been enabled to throw much light upon the immediate neighbourhood of the Persian Gulf, and the information, both political and commercial, he has gained will prove of great value. Of the present state of Bussora he gives an interesting account. The second volume will contain his observations on Bombay, where he was received

with true English hospitality. ('Illust. Polytec. Review,' March 30th, p. 182.)

NORTH OF ITALY.—*Bologna.*—We have lately been favoured by Count Hannibal Ranuzzi with a 'Notice on the Progress of Geography in Italy,' by which it appears that various local and general maps, dictionaries, &c., have lately been published throughout Italy, many of which have already been mentioned in my predecessors' Addresses. This industrious geographer is now publishing an 'Annual' of Italian geography, which, from a statement of its contents, seems to promise well. The subjects mentioned are,—Notes on Genoese navigators, prior to the discovery of America; on the Apennines of Tuscany; the geology of Piedmont; list and results of some of the more recent earthquakes; on the decrement of heat in various parts of Italy and Savoy; on the separation of Southern Calabria from the Peninsula of Italy, in the tertiary sub-Apennine period; travels along the sea-coast of Tyrrhenia; letters of Colonel Visconti to Comte Graberg af Hemsö; result of the labours of the mineralogical, geological, and geographical section, during the Fifth Scientific Congress, held at Lucca in 1843.

We are also informed that an edition of Balbi's ' ' is in course of publication at Naples, with notes, &c., by De Luca.

We owe to the Geographical Institute at Milan a beautiful topographical map of the duchies of Parma and Piacenza, in nine sheets, which Azzi has reduced to one sheet. Their last work has been the engraving of the map of the state of Este; it was made by the corps of engineers, and is based on a triangulation connected with the duchy of Parma and the kingdom of Venetian Lombardy. Here, too, we may notice the more extended geodetic and hydraulic operations of late years, and the numberless levellings effected with a view to the projected railroads from Milan to Venice, also to Mantua, Como, and Genoa. The examination of these lines, in connexion with the best ascertained water-slopes, and the many data already acquired from other operations on the roads, aided also by barometrical observations, will compose a comprehensive work on the declivities of the territory north of the Po hardly equalled in any other part of Europe.

Florence.—Dr. Attilio Zuccagni Orlandini of Florence is preparing a new general map of Italy in fifteen sheets, on the scale of 1 to 600,000, a work which will doubtless be much valued by all classical as well as geological explorers of that peninsula; and here it is to be remarked that the author of this map attempted, fifteen years ago, to carry on a journal specially dedicated to geography, which was abandoned for want of support; and it is in the establishment of the same geographer, the

author of the 'Corografia Fisica, Istorica, e Statistica dell' Italia,' that some of the best engravers of that country have found employment.

In the past year the same establishment has produced a map of Naples in the time of the Romans; a new plan of the city of Rome; six small maps of parts of the Pontifical States, &c., based on the trianguation of Inghirami, and new maps of Elba and the Vianosa.

In Florence a small map is in preparation, by Stanghi and Pozzi, of Parma, Lucca, Modena, and Tuscany, to accompany a work by Eugenio Alberi.

Austrian Survey of Italy.—An official commission of the Austrian État Major is ascertaining, by triangulation, the real range of the central ridge through the Pontifical States, to quadrate with that already determined in the North of Italy and in Naples, and thus to form an accurate net-work of the dominant physical features of the peninsula. The same institution, founded at Vienna, is about to produce a map of Italy in twenty-six sheets, on the scale of 1 to 288,000, like that of the Lombardo-Venetian kingdom, published in 1838.

When, however, we speak of the efforts of "Oltramontani" to promote a correct study of geography in Italy, it ought to be remembered that, as Italy produced geologists such as Moro and Scilla, at a time when our northern countries had no conception of the science, so had she, it appears, in her poet Guadagnoli D'Arezzo a real geographer; for he constructed tables in relief to show the relations of mountains, valleys, lakes, and rivers,—thus first striking out the idea of the relief or model maps which have been since so much improved. Many other works on the North of Italy, and by Italians, are in progress: such as a dictionary by Repetti, already at its fifth volume; a geological map, which, at first referring to the Island of Elba only, is to comprehend all Tuscany; and geological maps of Sardinia and Liguria, by the Cavalier Marmora and the Marchese Pareto, both very distinguished geologists. Of the progress made in the great map of Piedmont directed by General Annibal Saluzzo, we have not any precise information; but I hope very speedily to announce the completion of a work in which, in common with all others more specially occupied in my own branch of science, I am anxiously looking for—the geological map of the Piedmontese Alps, by that indefatigable and able explorer, M. Sismonda of Turin.

In the Lombardo-Venetian kingdom the lakes of the plain of Erba (accompanying his minute topographical map of Milan and its environs) are about to be represented by Brenna; whilst even San Marino has put forth its statistical and historical volume, with a map of the territory of the republic, which will appear in the 'Corografia Italiana' of Zaccagni.

NAPLES AND SOUTH OF ITALY.—Happily on this occasion I need not confine your notice to the North of Italy, for the Government of the Two Sicilies has at length taken measures to secure the correct delineation of this kingdom. Our associate, General Visconti, informs us that the triangulation of the first order, which was extended southward from the Austrian territories through the Pontifical States, was first applied to Naples in April, 1843, by the measurement of a parallel between the Island of Ponza, opposite Gaeta on the W., which, passing to the S.E. of Monte Circello, stretched to the little city of Fasano, in the province of Bari, and near the Adriatic on the E. Along this parallel observations were made upon the falling stars, with a view of ascertaining whether, in that serene climate, it was possible to determine thereby the differences of longitude between different parts of the same arc. The results were highly satisfactory, and have led to the continued use of this method. The eastern territory, between Naples and Fasano, on the Adriatic, is said to be already measured, and the western portion of the triangulation, in the same latitude, will be completed this year. The triangulation of the second and third order was carried, in 1842, along the coast of the Abruzzi, and has made much progress in the Terra di Lavoro.

The great map of the kingdom of Naples, on the scale of 1 to 20,000, has been continued between Sora, Gaeta, and Venafro, *i.e.*, all along the wild country which forms the boundary with the States of the Pope, and part of the Abruzzi.

A map of the environs of Naples, in fifteen sheets, and on a scale of 1 to 25,000, is fast advancing to termination, and will be completed in two years; and three sheets of the topographical map of the whole kingdom, on the scale of 1 to 80,000, exclusive of the map of the city of Naples, are already prepared. A small general map will be reduced from the larger scale, and a historical and civil dictionary will illustrate all these works.

The engraving of the hydrographical map of the Mediterranean, in three great sheets, intended for the use of the Neapolitan Navy, will very soon be issued; and it is said that the topographical plan of the Faro of Messina (1 to 10,000) will be finished this year. Those who wish to acquaint themselves accurately with the methods which have been employed in preparing the materials for the chief of these results, will do well to consult a Report made to the Royal Academy of Sciences of Naples, by Captain Yergola, who has taken the leading part in the triangulation of the kingdom from the year 1833 to the present date.

Thus we see that the great vacuum which has hitherto prevailed in

all the maps of Italy is about to be filled up, and that, availing themselves of the observations of the Northern Italian geographers, Inghirami and Marini, the Austrian Government deserves our warmest thanks for having, by its example and influence, extended and spread through the peninsula the same beautiful system of mapping which it has already applied, with so much effect and with such striking precision, to its German territories—the value of which I have often put to the test in my geological rambles, whether in the Eastern Alps, or along the confines of Hungary and Poland.

Austria.—In Austria Proper there have been lately published,—Wolney's topographical work, with six small maps of the Circles of Moravia, by Conr. Schenkel, at Brünn, and a description of Innsbrück, by Charles Schleich.

Of maps, there have appeared, the last sections of the environs of Vienna and Baden, drawn on stone, and coloured in the same way. This work is now completed; it has been executed by the Military Geographical Institute, and is in the scale of $\frac{1}{14,400}$.

The environs of Vienna and Baden, engraved on stone in three large sheets, on the scale of $\frac{1}{43,200}$, by the same.

The valley of the River Inn, from Zirt to the Bridge of Volters in Tyrol, scale $\frac{1}{14,400}$, by Pfeudler, at Innsbrück.

A new port map of the Austrian States, under the direction of the Port Administration at Vienna. 2nd Edition. Also a Railroad map of Germany, published at Vienna by Artaria and Co., and a perspective map of the Danube from Vienna to Buda, by Hummitt.

Artaria and Co. have also published a geological map of the country from Olmütz, in Moravia, to Gratz, in Styria; and a geological map of Vorarlberg, with profiles, has been prepared by Auten, Schmidt, and Lithochromed, at the Military Geographical Institute.

The application of lithography to the colouring of maps is, I believe, a new feature in the art, and one which is likely to be serviceable to cartography.

Of Austrian surveys, we hear that the survey of Bohemia, and that of Hungary on the left bank of the Danube, will be continued, and that a detachment of officers is about to be despatched to the right bank of the river. The scale of these surveys is $\frac{1}{14,400}$.

The trigonometrical operations in Transylvania and in Hungary will be finished this year. An azimuth will be measured near Lemberg, in Galizia.

The institute already mentioned is now engaged in engraving on copper the special map of Moravia, in nineteen sheets, on the scale of

$\frac{1}{14,400}$, and the general map of the same country in four sheets, on the scale of $\frac{1}{28,800}$. Some *livraisons* of the former of these, it is expected, will soon appear.

SPAIN.—*Maps.*—Of maps and charts there have been lately produced in Spain—A map of the eastern coast of Africa, including the island of San Lorenzo, or Madagascar, and the Mozambique Channel; a chart of the gulf of Tremezen, as far as Bujia; a chart of the harbour of Santander; a map of the coast of Africa and the island of Madagascar; a map of the southern portion of the coast of Africa, comprising the Cape of Good Hope, and a chart of Table Bay; a chart of Dampier Straits; a chart of Cape Berga to Gran Lahou, on the west coast of Africa; a chart of the Indian Ocean, with a part of Hindostan and the island of Ceylon; and a chart of the harbour of Castro Urdiales.

PORTUGAL.—The Royal Academy of Sciences of Lisbon are printing a collection of notices for the history and geography of countries beyond the sea, which among other curious matters will contain information on the Molucca Islands, according to the relation of Gabriel Rebello, in the 16th century.

The same learned body have also just published the first volume of reprints of Opuscula, relating to the migrations, conquests, and voyages of the Portuguese. This first volume contains the account of the discovery of Florida.

There has been published at Oporto the first sailing directions (*Routier*) for the coast of India, between Goa and Dio, by D. Joan de Castro, with an atlas. Captain Kopke, who was its editor, is just dead.

The second volume of the Portuguese translation of the Travels of Ibn Batouta, published by the Academy of Sciences, is about to appear.

Maps.—Colonel Frarini, known by different works, and among others, by his chart of the coast of Portugal, engraved by Mr. A. Arrowsmith in 1812, has just finished his map of Portugal on the scale of $\frac{1}{400,000}$. This map will be accompanied by a statistical, political, and administrative notice, and by a list of heights of the principal mountains of the country; it will be lithographed in Germany.

NORTH AMERICA.—You are all well acquainted with the discoveries on the N. coast of America, made by Messrs. Dease and Simpson; and it is still fresh in our memory that the Council, in token of the high value of their daring and successful explorations, awarded them one of the Gold Medals. From the very active part taken in the labours of the expedition by Mr. Thomas Simpson, the second in command, there can be but one feeling of the deepest regret that so enterprising and able an explorer should not have lived to enjoy his justly acquired fame. His

brother, Mr. Alexander Simpson, has, however, taken upon himself, and ably performed the duty, of publishing the narrative of the brilliant discoveries alluded to, a work which has, no doubt, been read by many, with that degree of pleasure which the modest and unpretending recital of dangerous and successful exploits never fails to excite. In addition to the volume in question, Mr. Alexander Simpson has most obligingly presented to us the original extended charts of the discoveries, drawn up by his brother; the Governor and Directors of the Hudson's Bay Company having kindly given them up to Mr. Simpson for that purpose.

Cree Language.—Closely connected with the discovery of new lands is the illustration of the languages spoken by the aboriginal races of mankind. In furtherance of this department of knowledge, the Royal Geographical Society aided from its funds the recent publication of a grammar of the Language of the Cree Indians, by Mr. Joseph Howse; a long and arduous labour, for which, from a long residence in the country of that people, that gentleman was peculiarly fitted. On this as on other occasions, we geographers, though looking chiefly to ethnography, were most happy to co-operate with a Society instituted for the purpose of diffusing Christian knowledge; and whatever may be the future fate of the remaining tribes of this remarkable family of the human race, which seems to be passing away so rapidly from the surface of the earth, I congratulate this Society on having been instrumental in procuring a perfect record of one of their most widely diffused dialects.

Isthmus of America—Projects of Communication between the Atlantic and Pacific.—The Memoirs of Mr. Baily and Mr. Wheelwright, read before us during the last Session, on the eligibility of opening out a communication between the Atlantic and Pacific Oceans, have revived the consideration of designs which were formerly brought into public notice. In the palmy days of her conquests Spain must doubtless have contemplated such a task, and according to a French writer,* the scheme was even entertained by Cortez himself. At a later period the Spaniards seem again to have thought of it, for the celebrated Don Juan de Ulloa was perhaps the only man of science during the last century who passed over the isthmus with instruments of observation. Yet even he left so few and such imperfect results on record, that when the great explorer Humboldt made us, for the first time, really well acquainted with the general structure of South America and Mexico, he dwelt with deep regret on our ignorance of the physical features of nearly the whole

* M. Davondeau, Annales Maritimes.

region of the isthmus. Comparing, however, the various sources of approximate knowledge, he urged in an energetic and eloquent appeal the accomplishment of more precise and detailed surveys.

The inhabitants of South America having thrown off their allegiance to Spain and established independent governments, every sort of scheme for the improvement of the country being hastily suggested, it was natural that the passage of the isthmus should be one of them, and in the year 1825—so memorable for the overwhelming ruin of many of our countrymen by South American Companies and their failures—all the projects for the execution of a great canal between the two seas which had been at any time discussed, were collated by Mr. Pitman in his "Succinct view of the practicability of joining the Atlantic and Pacific Oceans." Endeavouring to interpret the evidences — many of them contradictory—which are to be found in the narratives of the Old English buccaneers, he arrived at the conclusion, that of the five lines of communication which had been suggested, that of Darien was the most attractive on account of the excellent roadsteads in both seas on that parallel, though the cutting through the cordillera, which is there steep and lofty, it was admitted, would be an expensive operation. The other four projects which this author rejected were, 1st. The joining of the rivers S. of Darien, in the province of Choco; 2ndly. The union of the waters of the Chagres, and of its affluent the Trinidad, with the streams near Panama. 3rdly. The union of the Gulf of St. Juan, through the river of that name and the Lake of Nicaragua, with the Gulf of Costa Rica, or by other lateral terminations on the western and northern parts of the Lake Nicaragua—and lastly, the execution of the line formerly much countenanced by the viceroys of New Spain, viz., to connect the River Huasacula on the Gulf of Mexico with the Bay of Tehuantepec in the Pacific.

The last mentioned of these lines has been much spoken of lately, and I have had some conversation thereon with M. Moreau, an able engineer, who has closely surveyed the country, and who is prepared to show, both from the map of that tract executed by our corresponding member Don Juan de Olezago, and sent to us in 1825, as well as from his own observations, that whether the nature of the rivers, the abundant population, or the capability of the opposite sides be considered, this Mexican communication is highly desirable. On the present occasion, however, I must specially direct your attention to the two projects which have been distinctly brought before us by Mr. Baily and Mr. Wheelwright. The first of these gentlemen, enlarging upon the previous excellent account by Mr. Laurence of the River St. Juan and the Lake

of Nicaragua,* has minutely examined that portion of this line which lies between that Lake and the Pacific. In this survey he found the watershed to be 615 feet above the sea level, and composed of a soil easy of excavation; and from these and other considerations he conceives this line to be very preferable to that between Chagres and Panama, along which he contends four different streams would have to be deepened, controlled, and rendered navigable.

The objections to the line of Panama, as formerly noted by Mr. Pitman, were the supposed height of the central ridge, the absence of any convenient large port near Panama, the shelving and shallow shore of the Pacific at that point, the insalubrity of both coasts, and the want of an adequate supply of manual labour. Since that time, however (1825), Captain Lloyd, a skilful English surveyor, determined with precision the real levels between the two seas in the parallel of Panama, the expenses of his survey being defrayed by General Bolivar and the Columbian government. The elaborate and valuable researches of Capt. Lloyd, which are recorded in the Transactions of the Royal Society, were therefore the first which removed the old and erroneous belief in the existence of a high and persistent central ridge, whilst they also answered the question of whether the Pacific Ocean was higher than the Atlantic? They in fact demonstrated, that in this latitude the cordillera dwindles into a series of isolated hillocks, amid which a watershed, 633 feet only in height, separates the one sea from the other; and making due allowance for the respective rises and falls of those great masses of water whose tides are necessarily influenced by the form of the coast and periodical winds, it was proved that to within a very slight difference their levels were the same. Thus the disgrace, which till then hung over civilized nations, in the energetic remonstrance of Humboldt, was wiped away by our countryman Lloyd, and one of the anticipations of the great geographer respecting the equalization of the levels of the two oceans was completely realized.

The Memoir of Mr. Wheelwright, to which I have alluded, is simply a praiseworthy endeavour on his part to sustain and extend the value of the researches of Capt. Lloyd (whom he accompanied), in doing which he brings forward his own arguments, formed after a long residence in that country, in support of some effort being made to open a communication across a tract which presents so few physical difficulties. He tells us that the Bocca del Toro on the Atlantic will serve as a roadstead for the largest fleets, and that coal is to be had along its shores—that with steam-power the ascent of the Chagres and Trinidad rivers, to a certain

* Read before this Society, and published in the 'Nautical Magazine.'

point of portage, could be easily effected, and that from thence to Panama the intercourse, whether by a common road, tram, or railroad, or by a canal, could be so conducted as to wind through low hillocks presenting no sort of obstacle.

Among these conflicting opinions it is no easy matter to come to a right conclusion as to the most eligible line; but should no great canal be executed in our day by which vessels should pass from one ocean to the other without breaking bulk, let us hope at all events that one of the more modest propositions of Mr. Wheelwright may be adopted, and that, if only for the benefit of the coasting trade of both shores, some easy and practicable route for passengers and goods may be speedily established between Chagres and Panama.

BRITISH GUAYANA.—*Schomburgk.*—From British Guayana we have heard of the late explorations of our well-tried and enterprising associate the Chevalier Schomburgk. Leaving George Town in February, 1843, he arrived at Pirara on the 24th of March, where he joined the rest of his party. On the 30th of April they started, and the state of the Rupununi, swollen by the rains, allowed them to ascend that river to a height never before reached with canoes so large as theirs. From the Kepununi, the party having to continue their route overland, the canoes were sent back under the command of Mr. Fryer, while Mr. Schomburgk, accompanied by Mr. Goodall, directed his course across the Carawaimi Mountains. In the course of his route in this part of the country he found indigenous cocoa-trees in the greatest profusion; and observes, that "these inexhaustible stores of a highly-prized luxury are here reaped solely by the wild hog, the aguri, monkeys, and the rats of the interior." On the 8th of June they reached a settlement of Taruma Indians, on the river Cuyuwini, but measles and small-pox had done their work of destruction since Mr. Schomburgk's last visit to these people, whose number had decreased from 200 to 30. Descending the Cuyuwini, in woodskins or bark canoes, they again entered the Upper Essequibo on the 21st of June. Several days' journey above the confluence of the two rivers, Mr. Schomburgk discovered a plant having an edible tuberous root of the size of the largest yam, which, if it could be made to succeed on the coast region, would be a valuable addition to the esculents of George Town, where he distributed seeds accordingly.

At the mouth of the Urana, which enters the Essequibo in about 1° 37′ N. lat., the travellers abandoned their woodskins, and continued their course inland; and, after crossing a chain of hills, arrived on the 13th of July at the sources of the Onororo, a tributary of the Essequibo, and ascending an elevation of about 100 feet higher than the origin of

the first river, reached the sources of the Caphiwuin, or Apiniau, the head waters of the large river Trombetes, which flows into the Amazons. The chain of hills is here 2000 feet high, and forms the watershed between the basin of the Amazons and that of the Essequibo. Here they found the remains of the once powerful tribe of Maopityans, who had neither the means, nor apparently much inclination, to afford the travellers any assistance. Collecting, however, what provisions they could, and preparing fresh woodskins, they commenced their descent of the Caphiwuin, being told that the next stage could not be reached in less than eight days. The navigation of the river was particularly perilous, on account of the number and height of the falls. On the 29th of July they reached the confluence of the Caphiwuin with the Wanamu, the united streams being called by the natives the Kaphu. At this time the travellers had already been eleven days from their last starting-point, and were informed by a party of Zarumata Indians that they would have to ascend the Wanamu for eight days more before they could expect to find an Indian settlement. These Indians could not give them even so much as a plantain, so that they were greatly straitened for food (Ath., p. 1091; see also p. 1093). On the Caphiwuin, a little above its junction with the Wanamu, and to the eastward, is the formidable tribe of Tapir Indians, who are said to be cannibals, and to form drinking-vessels of the skulls of their vanquished foes. Mr. Schomburgk, however, could nowhere find the far-famed Amazons, who, according to Herrera and Acunha, opposed the landing of Orellana at the mouth of the Cunuriz, the present Trombetes. Our traveller now ascended the Wanamu, where a circumstance occurred which, but for his admirable judgment and courage, might have been attended with the sacrifice of the whole expedition. Proceeding northward, and ascending Irian, Mr. Schomburgk was again obliged to abandon his canoes, and, alas! the greater part of his collection of objects of natural history and ethnology, for want of a sufficient number of Indians to carry them. After extraordinary fatigue and privation, the party at last reached, on the 21st of August, the first small stream that runs towards Corentyn, and came to a settlement of Drio Indians, who received them in the kindest manner, and even sent for and fetched the baggage left behind. For the third time the party had to construct woodskins, with which they hoped to descend to the coast. Having filled their canoes with as much provision as possible, and, accompanied by their ever-faithful and trusty Macusi Indians, the party commenced their route for the coast region on the 6th of September. No one knew the river; but they were told that in ten days they would reach a native settlement. Many rapids were

met with, in succession, which, though not dangerous, were exceedingly harassing to the party. One fall, however, more formidable than the rest, and where they had to unload their canoes, was called, by Mr. Schomburgk, "Sir Walter Raleigh's Fall." The course of the Corentyn is described as being spread out to the breadth of several thousand yards by the rocks and islands with which it is intersected and studded: nor was there the slightest trace of man having ever visited these solitudes. Instead of ten, fourteen days had already elapsed, and no sign of any settlement appeared; and all the provisions were consumed, except a basket of farina. Each voyager was therefore, of necessity, put upon the short allowance of six ounces of farina per day. The history of the succeeding ten days is a record of nothing but difficulties and dangers overcome, and privations and sufferings endured with courage and uncomplaining fortitude. Of all the rivers he had ever visited, Mr. Schomburgk says the Corentyn is the most perilous to navigate. The canoes now began to show the effects of cataract navigation, and the travellers had to tear off pieces of their clothing to stop the leak-holes, hourly increasing by fresh collisions against the rocks: indeed, they were obliged to abandon one of the canoes. At last, on the morning of the 28th of September, they reached the foot of the great cataracts visited by Mr. Schomburgk in 1836; but four days of privation and fatigue were still before them, ere they could hope to reach a Carib settlement; and only a few pounds of farina remained for the party, consisting of fifteen individuals: "And when," says the explorer, "I threw a glance upon the emaciated forms of my Indian companions, the very word to urge them to paddle stronger died upon my lips." On the morning of the 1st of October, the last morsel of farina was shared out, amounting to something more than two ounces for each individual. Stern necessity now urged them to a last exertion of their failing strength; and, fortunately, they were soon cheered with the sight of the first Carib settlement, where their wants were speedily supplied. The next morning Mr. Schomburgk continued the journey, leaving Mr. Goodall to follow more leisurely with the rest of the party, the following day. Ultimately, on the 13th of October, the whole party reached George Town. Thus had this most enterprising and able traveller completed the circuit of the colony of British Guayana. In a letter to our Society, alluding to this last exploration, and to his labour in Guayana generally, Mr. Schomburgk says, "This has been the most interesting journey I ever undertook; our fatigue and privations have been great, we all arrived upon the coast like walking skeletons: but it is with pride and satisfaction I can add, that, whatever have been our dangers, not a

single individual has perished in the undertaking, which has occupied us since 1841."

If I have dwelt longer upon this journey than is strictly consistent with the nature of an Address like the present, it has been because the details of this expedition, having been printed elsewhere, cannot, according to our rules, find a place among the papers in our Journal; and I have thought it desirable that this crowning labour of a gentleman whose early explorations were acknowledged by this Society with one of its medals, should be noticed from this chair as it deserves. Few men are better formed than the Chevalier Schomburgk for the very arduous task of conducting exploratory expeditions in unknown regions. Conciliatory in his manners, yet firm, cool in judgment and prompt in action; inured to privation and fatigue, and undaunted by difficulty and danger, zealous and persevering—such is his moral character; and when to this are added his various acquirements as an astronomical observer, as a botanist and naturalist, it will be conceded that he is one of the first travellers of the day—one of those, in fact, formed in the school of Humboldt, whose researches and observations extend alike over every subject of interest, and make us fully acquainted with the regions they explore.

Australia.—Notwithstanding the arduous travels of so many of our countrymen, many of whose labours are recorded in our volumes, or in the general literature of our country, there is no part of the world to which British influence has extended, which contains such vast tracts of yet untrodden ground, nor any one in which so great a geographical problem remains to be solved as Australia. It is therefore with satisfaction I have recently perused the report of a select committee of the Legislative Council of Sydney, upon the endeavour to establish an overland communication between the settled districts on the south, and Port Essington on the north of that vast continent.

If we are to confide in the clear and decisive testimony of Sir Gordon Bremer, and other naval officers, including Captain Everard Home, as well as in that of Mr. Earl and Captain M'Arthur, who have thoroughly examined the regions around it, we should be led to think that in all her schemes of future commerce, Great Britain has rarely had it in her power to place her standard on a more desirable spot than Port Essington. With an outer harbour, capable of containing the whole British navy, and an inner harbour, in which twenty-five sail of the line can lie at ease; with a climate peculiarly healthy to Europeans, in which spices, indigo, sugar-canes, the cotton and the choicest woods can be grown in abundance, whilst the sea swarms with the finest fish; this port further offers the great advantage of having a quiet and industrious race of inhabitants in the adjacent islands, who, as well as the more active

inhabitants of Timor and the neighbouring isles, and also the Chinese, are ready to flock to the settlement. I am, indeed, led to believe, that no sooner shall our government render Port Essington a permanent and independent colony of the Crown, than several rich mercantile houses in London will at once set up establishments there, and freight large vessels for the trade which they would carry on through it with the Eastern Archipelago and China.* Already many of the enterprising Malays resort thither for the fisheries, and are ready to exchange their salted fish and other products for British cottons; and as an *entrepôt* it is daily becoming more important from the rapidly increasing intercourse between our Australian and Indian possessions. Grand as is the future prospect of intercourse with India, the Eastern Islands, and China, Port Essington is not, however, to be viewed merely in reference to commerce. As a place of refuge in a wide ocean it has a strong claim upon our nation, and it has already even in its infant state been the means of saving the lives of crews who had taken to their boats, even as far off as Torres Straits. In this respect, indeed, a more intimate acquaintance with the Gulf of Carpentaria and Torres Straits, so dangerous from the adjacent coral reefs to ships which try that passage, may lead to the discovery of an additional harbour in its vicinity. But independently of this consideration, Port Essington ought to be viewed as a most advantageous naval station for Great Britain in case of war; and with the extension of steam navigation, it is further to be regarded as the point by which in all probability our future correspondence with our South Australian colonies might be most expeditiously and beneficially carried on.

With such attractions therefore held out to them, and seeing in this port (undoubtedly one of the finest in Australia) a probable outlet for their own productions, it is quite natural that the legislature of Sydney should have made the recommendation to which I have alluded, and which all geographers must heartily wish may be carried into effect, however they may differ in their mode of accomplishing it.

Before the feasibility of any scheme can be judged of, we must fairly picture to ourselves all the physical conditions and general outline of Australia. In all other continents of so large a size, many large rivers occur; but with the exception of the Darling and its tributaries, which flow to the west and south-west, and where the region is comparatively narrow, all the explorations of the northern and western coasts (where

* I learn from my accomplished friend, Capt. Owen Stanley, R.N., who was employed in surveying during upwards of two years in these regions, that Port Essington has the disadvantage of being exposed to occasional tornadoes—inseparable perhaps from tropical stations. This intelligent officer is of opinion that great benefits might follow, from an accurate survey of the very fertile and well-peopled islands to the north of Australia, and which are grouped around Timor.

the country has a breadth from E. to W. of 2000 miles) prove the non-existence of the mouths of great streams. On the east coast, on the contrary, rapid flowing streams with short courses abound. These results seem indeed to follow from what we already knew of the outline and nature of the surface. The only great and persistent axis of the country as determined by its elevation and the crystalline structure of its rocks, is the long, low cordillera, which trends on the whole from N. to S., and at a short distance only from the eastern coast. The journey of the late Mr. Cunningham, who traced this ridge to 27° S. lat., in the parallel of Moreton Bay, and the numerous traverses of it by Sturt, Mitchell, and other travellers in their exploratory passages to the interior, had necessarily made us acquainted with it at many points.

Another traveller, M. de Strzelecki, who has already given some short accounts of a southern portion of this chain, will shortly appear before the public with an important work explanatory of its general structure and physical features. Passing five years in the country, he traced these mountains continuously on foot from 31′ to 44° S. lat., and whilst making this survey, which obtained for him the warmest approbation of the Governors of New South Wales and Van Diemen's Land, Sir George Gipps and Captain Sir J. Franklin, R.N., M. de Strzelecki repeatedly crossed it, and examining its lithological characters in detail, ascertained that it had a mean altitude of about 3500 feet, and was on the average 70 miles distant from the sea. In Van Diemen's Land he found the axis of the same crystalline rocks to be prolonged in a curvilinear direction, whilst to the north of our settlements of New South Wales, he found by sailing along the coast the same chain, there coming close to the sea, as determined by the admirable survey of Captain P. King, was persistent to Torres Straits at the north end of the Gulf of Carpentaria, and that on the north side of these straits it is again prolonged in the same direction far into New Guinea.

With the exception then of a few embranchments towards its southern end, which throw off the waters of the Darling and its tributaries into the new settlements of South Australia, and of the curvilinear band in Van Diemen's Land, this chain may be said to have a meridian direction through upwards of 35° of latitude, and is therefore considerably longer than the Ural, another great meridian chain, of which I have elsewhere spoken, even if we include in the latter the great islands of Nova Zemlia. The Australian chain further resembles the Ural in being composed, according to Strzelecki, of an axis of eruptive or igneous rocks (greenish syenite, greenstone, porphyry, serpentine, &c.)—some metamorphic rocks (quartz rocks and slate) with unquestionable pa-

læozoic deposits on either flank. It still further resembles the Ural in altitude and in the total absence of all free transported blocks or boulders, all the alluvia or diluvia being local; but it so far differs from the Ural and many other meridian chains, in having as yet offered no trace of gold or auriferous veins. Apologising for having momentarily drawn your attention to a comparison between this Australian chain, and one with which I am acquainted, I must refer you to the forthcoming work of M. de Strzelecki, for many mineralogical and geological views, as well as for barometrical and meteorological observations made over a very large area by that intrepid and intelligent traveller, entirely for the love of science, and at his own expense.*

The point for our present consideration is, whether, when explored to the north, this Australian cordillera is likely to afford on its western flank a sufficient quantity of water to support any travellers who may attempt to pass across the country which lies to the west of the cordillera, and so to reach the head of the Gulf of Carpentaria? As no great rivers are found to empty themselves upon the western or northern shores of this continent, as ascertained by the explorations of Grey, Lushington, Wickham, Stokes, King, &c., and as it cannot be doubted that waters must be thrown off inland from the eastern cordillera, the interesting points to determine are the true nature of the country which approaches to that chain on the west, and how the streams are absorbed or lost. Basing their opinions upon the absence of the mouths of great rivers upon the west, and also judging from the character of the country into which they have penetrated, our most intelligent explorers (among whom I would particularly cite Governor Grey) are of opinion that the chief mass of the interior will be found to consist of valueless jungle, marsh, and sand—the desiccated and slightly raised bottom of an ancient sea—in which, deprived of good streams and subjected to an inter-tropical climate, civilized man could only look for the most scanty means of subsistence. The sterile nature of a portion of the country extending to the north of the settlement of South Australia had been to a great extent determined by Lieutenant Eyre; but the subsequent researches of Captain Frome, the surveyor-general of that colony, have indeed rendered the account still more striking, for he has ascertained that what appeared to Mr. Eyre to be the south-eastern end of Lake Torrens, was in fact a mere sandy desert, at a height of 300 feet above the sea, with a few low sand ridges rising out of it, which to him, as well as to Lieutenant Eyre, appeared by the refrac-

* M. de Strzelecki has prepared a most valuable and colossal geological map of New South Wales and Van Diemen's Land, which he cannot publish at his own expense: it is well worthy of the patronage of the British government.

tion of the atmosphere to be a lake with islands until absolutely examined. This desolate tract, in which salt springs abound, and in which fresh water is only known in occasional floods, may I apprehend be taken as a type of large portions of the interior of this singular continent, and even in this comparatively narrow portion of it, great must be the privations even of those who effect a passage from the inland points of Southern Australia to that part of the banks of the Darling, already known to us by the surveys of Mitchell.

But to return to our object—the traversing of the continent from New South Wales to the Gulf of Carpentaria. From what point ought the exploratory expedition to start, and what direction should it take?

Commenting upon the relative advantages of a departure either from Fort Bourke, the most north-western settlement of the colony, or from Moreton Bay, the Committee of Sydney, guided by the opinion of Sir Thomas Mitchell, give the preference to the former. It would ill become me to set up any opinion which I may hazard against that of Sir Thomas Mitchell, so distinguished for an acquaintance with that country; but I cannot avoid stating that Fort Bourke, already a long and tiresome march from Sydney, seems to me to be much too far removed from the Eastern cordillera, from whence any regular supply of water can alone be looked for. As yet we know but of one small river on the right bank of the Darling, and as the tract N.W. of Fort Bourke is slightly elevated, and we also know from the former survey of Capt. P. King, and from the recent surveys of Capts. Stanley and Stokes, that a few degrees further N. the cordillera runs close along the sea-coast, so does it seem to follow that, if the explorers are to depend upon any supply of water flowing from that chain, they would necessarily have to traverse several hundred miles of land before they fell in with it. The case is simply this: granted that the cordillera be found to throw off waters to the W. as well as to the E., to what distance westward will they run before they are absorbed or evaporated in the sandy interior deserts? If we are to reason after the analogies of all other parts of this continent, it is only (using a nautical term) by "hugging" this chain that a successful march can be accomplished. Arguing, therefore, from the data before them, some shrewd practical geographers, including Mr. Arrowsmith, differ from Sir Thomas Mitchell and the Committee of Sydney, and give a preference to an advance from the well provided settlement of Moreton Bay, from whence by obliquely traversing the adjacent cordillera, the expedition would at once be 3° of latitude to the N. of Fort Bourke, and consequently so much nearer their ultimate point of destination, the mouth of Albert's

River, in the Gulf of Carpentaria. Other persons, and among them I may mention Capt. Owen Stanley, as well as his friend Capt. Stokes, are of opinion that separate expeditions should be sent across the cordillera from different parts of the coast, whereby the nature of the intervening tract on the western slopes of the chain could be made known before so long an interior march was hazarded. Others again may say, with our member, Mr. Gowen, that a thorough exploration of the interior of Australia will never be effected until we import thither camels from our eastern possessions, and thus at once get rid of the vast difficulties attending the want of water.

All these points are doubtless well worthy of consideration; but if I venture to express my own opinion, I should say that the best practical and geographical results will follow from the researches of an expedition purposely fitted out simultaneously to explore the cordillera itself, by land and by sea, from the point to which the researches of Conyngham have carried us to Torres Straits. Already, through the labours of that individual and M. de Strzelecki, half the cordillera is known and mapped, why then not complete the land survey? If the chain (and its western flanks to a certain distance only inland) be adhered to, no want of water can be experienced, and if the Government should determine to order a surveying vessel to coast along and supply the party at stated intervals with provisions, and also co-operate with it in making scientific observations, every object of the geographer would be obtained, whilst the practicability of a route along the western side of the chain would be completely set at rest. Such a survey at all events seems to me to be absolutely essential before any party is launched from Fort Bourke into the interior, which we have so much reason to apprehend is a complete desert. Whatever plan may be ultimately adopted, let us hope that in her effort to connect her distant settlements upon that continent, Great Britain may have the honour of solving a great geographical problem, and of ascertaining whether Australia be the only region of the same size upon the surface of the globe which offers the singular configuration which has been attributed to it, of having nearly all its rivers absorbed during their course.

From this general and speculative view of Australia, we have now to turn to some of the recent advances which have been made in extending our colonies, or in acquiring fresh knowledge of the country. Capt. H. Hamilton has lately communicated to us a paper on a part of the country lying between Liverpool Plains and Moreton Bay, which, together with an accompanying sketch map, furnishes us with some remarkable details on the geography of a district yet imperfectly known, but which,

from its natural advantages, promises ere long to become a very important addition to the colony of New South Wales. On the other hand, Capt. Sturt, by a correct survey of the course of the Hume River, and of the hilly districts extending to the junction with the Morumbidgee, has distinctly made known the valueless character of many large tracts which, having been now laid down upon a map, may be avoided by all those who are searching for appropriate sites of new settlements.

PERSIA.—I have great pleasure in announcing a very interesting and important exploration in the southern part of Persia, by Lieut. W. B. Selby. This very energetic officer has succeeded in ascending, with his steamer, the river Karún as far as Shuster. But I cannot perhaps do better than copy verbally into this Address the account of Lieut. Selby's proceedings, as given in the Bombay Times of last December :—

" During the absence of Lieut. Campbell, the Euphrates and Assyria steamers were confided to the care of Lieut. W. B. Selby. This enterprising officer, instead of confining himself to 'a regular communication' between Baghdad and Basrah, explored the river Karún, the river of Dizful, the Keskhah, the Hie, and the Bámsheer. He ascended the Karún to Shuster, both by the main body of the river and by Abi Gargar, or artificial canal. He fully established the practicability of the navigation of the Bámsheer; and proved the possibility of communicating by steam between the Euphrates and Tigris by the Hie.

" These are by far the most important results of the Euphrates expedition; and should a steam communication be hereafter established on the rivers of Mesopotamia and Susiana, for commercial or other purposes (which we firmly believe will, before many years, be the case), the discoveries of Lieut. Selby will be duly appreciated. This officer, by his courage, his perseverance, and his scientific knowledge, was admirably calculated for an expedition of this nature. His valuable charts and reports will afford additional assistance in the illustration of the comparative geography of one of the most ancient, though least known, provinces of the Assyrian empire, Susiana. He has connected by scientific observations the course of the Eulaus, the Choaspes, the Coprates, and the Pasitigris, with the range of mountains forming the great chain running to the E. of Shuster, and with the rivers Euphrates and Tigris. He has proved the practicability of rivers, the course of which was hitherto almost unknown; and all his discoveries will confer important benefits upon British commerce."

Such are the terms in which this important expedition is announced in the paper already named, and they are certainly such as Lieut.

Selby's successful effort eminently warrant. It may perhaps be remembered that the Karún had already been ascended by Colonel Chesney as far as the bund at Awaz, an obstacle then deemed insurmountable. Lieut. Selby, however, found means to overcome it, and arrived triumphantly into the very heart of the country, to Shuster and up the Dizful. I shall only therefore add in this place, that I trust the Court of Directors of the East India Company, with their known liberality, will not only enable us, through the medium of our Journal, to give proper publicity to Lieut. Selby's memoir,* and his survey of the river, but also enable that enterprising and skilful officer to undertake an exploration of an unknown portion of Arabia, to which service he is desirous of devoting his best energies.

Hadramaut, and its swallowing sands.—A considerable tract of that part of Arabia, called Hadramaut, to which Dr. Forster has attached so much new interest in his ingenious solution of the Himyaritic inscriptions already alluded to, has been explored for the first time by Baron Adolph Wrede, whose account of his excursion from Aden has been communicated by Captain Haines, R.N.

Proceeding from Ossurum by Makalla to Wadi Doan, and traversing first a granite region with deep gorges and serrated peaks, and next a plateau 8000 feet above the sea, he reached, amid considerable difficulties, the town of Sava in the valley (Wadi) Rachia. It was at this place he heard of the desert El Aklaj, along the edge of which is the tract Bahr el Saffi, so called after a King Saffi, who, according to Arab tradition, was there, together with his whole army of Sabæans, swallowed up by the sands—a spot to which our traveller's Bedouin guides naturally conducted him unwillingly and with awe. Having gained the edge of the fatal spot, he cast upon it a plummet weighing half a kilogramme, which gradually sank till the cord (360 feet long) to which it was attached was run out, and thus he completely established the fact, that in these dry sands, which are composed of very fine and impalpable grains, any object of very moderate weight sinks to great depths. Hazarding no opinion of his own, and leaving the explanation to others, it is very much to be regretted that Baron Wrede has not given a sufficiently precise account of the physical features to enable us to reason upon the cause. Is the spot of swallowing sand higher than most of the adjacent country? Are the two "rocky blocks" of which he speaks as being close to it, points of rock "in situ" which communicate with other rocks beneath, amid which there are fissures? If these postulates

* Since this address was read, the Directors have transmitted to the Society a copy of Lieutenant Selby's narrative.

be granted, and he uses expressions which lead me to think they may, then I should have little difficulty in imagining how the impalpable sand, driven by the winds and accumulated in a mass in an upland cavity between projecting points of rock, should, upon a slight disturbance, run off into adjacent cavities. Indeed, we might conceive a whole tract of rocks of devious outline, and full of fissures, on the surface of which the sands were, by the force of the winds, constantly changing their position, and through the crevices of which they would be ready to escape from higher to lower levels upon the application of a small disturbing agent, just like the sand of an hour-glass. Such an explanation reduces the tomb of the Sabæan army to a simple natural phenomenon; but if, from the nature of the ground, this view be inadmissible, is it possible to conceive that these sands of Bahr el Saffi are in parts so very fine and impalpable that they offer no greater resistance than water?

Let us trust that the Baron will favour us with some more precise details, before he calls upon us to attempt the solution of so difficult a problem; and in the meantime, we may thank him for having drawn our notice to this very curious spot, in a country which will now doubtless be visited by many travellers bent upon the development of the Himyaritic inscriptions with which it abounds. Already an able and enterprising young clergyman, the Rev. J. Brockman, incited by the work of his friend Dr. Forster, is on the point of exploring Hadramaut.

India.—*Bombay.*—In India there have been made some valuable accessions to our knowledge of the country—a natural result of the late military operations in that part of the world. The papers, however, which have been drawn up by the officers of the Indian army, are consigned in the Journal of the Bombay Geographical Society, who, we are informed, have put that publication into a better state, have brought up its arrears, and indexed its contents. We have for some time been promised the set complete, and are anxiously expecting its arrival.

Land and Maritime Surveys.—The seventh Volume of the General Report of the Trigonometrical Survey of India, containing the computations of the measurement of the meridional arc, has been sent home. Volumes VIII. and IX. of the Operations to the East of the Arc are completed, and may be daily expected; the triangulation has been extended over Rohilcund, and very nearly the whole of the Dooab. Surveying parties are occupied on new meridians east of these tracts.

During the past year new editions of sheets 76 and 77 of the Indian Atlas, containing the survey of Nillore, also of sheet 80, containing portions of the districts of Trichinopoly and Madura, have been published; sheet 79, containing the Salem district, and the remainder of Trichino-

poly; sheet 55, containing the districts of Nandaw, Beder Daroor, &c.; and sheet 107, containing Ganjam, Goomsoor, &c., are in the hands of the engraver, and will be published shortly. Several other sheets, being in continuation of those already executed in Northern India, are in hand, and will proceed without further delay.

With respect to the marine surveys by the officers of the Indian Navy, the harbours of Soonmeeana, by Lieutenant Montrion, and of Kurachee, by Captain Carless; also the coast of Africa, from the Straits of Bab el Mandeb to Berburra, by Lieutenant Barker, have lately been published. The Gulf of Manar, with the coast of India from Cape Comorin to Point Colymere, has been surveyed by Mr. Franklin, R.N., and will be published in the course of the present year.

Hong Kong.—Mr. A. R. Johnston has given us a very clear account of the physical features, population, productions, and climate of the little island of Hong Kong, now so important a British station. Composed of granite rock, which varies in height from 500 to 1744 feet above the sea, and supplied with abundant springs, it would be difficult to imagine "*à priori*" a more healthful position in such a latitude. But such has not proved to be the case: intermittent and remittent fevers, as well as dysenteries, having been prevalent.

AFRICA.

Tripoli.—A short account of Tripoli from our Consul, Colonel Warrington, who has for so many years resided there, though not remarkable in conveying new geographical facts or statistical knowledge, is useful in making us better acquainted with the climate and nature of the country. It also possesses considerable interest for the politician and moralist, in explaining to how great a degree British influence is extending into the interior of Africa, and how, by encouraging legitimate traffic and barter with the natives through such ports as Tripoli, we are more likely to succeed in annihilating the slave trade than by any array of fleets, or hostile embargoes.

EGYPT.—*Canal of Suez.*—The project of a canal communication between the Mediterranean and the Red Sea, ably discussed as far back as 1825 by Mr. Maclaren,* and more recently by an anonymous writer in 1836,† has been again brought to our notice by an excellent pamphlet on the subject by Captain Vetch, of the Royal Engineers, a gentleman whose opinion must have great weight. It is not my intention to go

* Edinburgh Phil. Journal, 1825, p. 294.
† For. Quart. Rev., 1836, p 362.

into the history of the canal which existed formerly, nor to discuss the merits of the various lines now proposed, for these are questions of engineering science collateral only to our objects; but I mention the subject, because any undertaking by which travellers can more readily arrive at distant regions is interesting to us as geographers, and highly serviceable to the progress of civilization.

On this subject a memoir has been published by M. Aubert Roche, in the 'Revue de l'Orient,' in which he states it as his opinion that the canalization of the Isthmus of Suez is "one of the most important questions which can agitate Europe."

I may here observe that Captain Vetch's geological knowledge, and his acquaintance with the nature of ancient sea beaches, give weight to his suggestion, that at no very distant period, certainly in the most recent geological epoch, Asia must have been separated from Africa by an arm of the sea which covered all the lower parts of the Isthmus of Suez. Looking to the very small amount of elevation of the land to the E. and W., he successfully repudiates the proposal of merely letting in the waters of the Red Sea (which stand at a higher level than those of the Mediterranean) upon the intervening ground, by which an uncontrollable mass of shallow water, useless for any commercial end, would destroy valuable tracts of ground, and in the absence of all hard rocks on its sides would communicate with the mouth of the Nile. His own project of a straight line of canal from Suez to Tineh, seems indeed to me to be infinitely preferable to those lines further to the W., by which the ancient canal and the lakes of Baka and Themsal should be made available. The waters of the Red Sea being 29 feet higher than those of the Mediterranean, it does appear rational that a straight canal, with well-confined banks, would be effectually cleaned and scoured by a steady current always flowing from Suez to Tineh. Whether it may be worth while to employ the energies of Britain in executing such a work, is a distinct question, handled by Captain Vetch with much candour; but, if undertaken, it is probable that it would be attended with fewer obstacles than the scheme of uniting the Pacific and Atlantic.

Sir Gardiner Wilkinson, whose long and able researches have cast so bright a light on ancient Egypt, has lately published another work, entitled 'Modern Egypt and Thebes,' in two volumes, which will be found highly useful to all travellers into a country the cradle of all learning and science.

We have also to acknowledge the services rendered by Sir Gardiner to the interesting subject of Egyptian topography, in the notice he has sent home of his having finally settled the question of the site of the city of

Sais in the Delta, by the discovery of a hieroglyphic inscription amongst the ruins of Ssa-el-Hajar, bearing the name of Neith, the lady of Ssa.

Lake Mœris.—Among the most important discoveries effected of late years in Egypt, must be mentioned the site of the celebrated Lake Mœris, by Mons. Linant de Bellefond, Chief Engineer to Mehemet Ali. This large artificial reservoir, described by Herodotus as having a circuit of 3600 stadia, or about 360 geographical miles, and 300 feet deep, with two pyramids in the midst of it, and connected with the Nile by a canal, was destined to receive the superabundant water of the river during the annual inundations, and to let it off for the irrigation of the lower lands. The exact site of so stupendous a work was hitherto unknown, no one of the explorers who have examined the country having satisfactorily determined it. This may probably be attributed to the fact, that the Berket Keirún has generally been regarded as the remnant of Lake Mœris. This, however, M. Linant has proved, by considerations into which I cannot go in this place, could not possibly be the fact; and that author, who had previously come to the conclusion that the site of Lake Mœris must be sought in the higher part of the Fayúm, has had the satisfaction, by a special examination of the territory, of finding his conjecture perfectly confirmed. He, however, ascertained its extent to be only 150 square miles, an immense area it must be confessed for an artificial lake, though greatly inferior to the dimensions given to it by Herodotus. The bed of the lake is considerably raised, as might indeed have been anticipated, by deposition from the muddy waters of the Nile; and it is probably this circumstance which has prevented its site from being sooner discovered. M. Linant is of opinion that the lake, with all its advantages, might be restored at a comparatively small expense.

ABYSSINIA.—Various political circumstances and international arrangements—among which may be particularly mentioned the British settlement at Aden, the political mission from thence to the kingdom of Shoa, and the steam navigation of the Red Sea—have recently conferred an increased degree of importance upon Abyssinia, not only in our own eyes, but also in those of other European powers. Visited by Bruce in 1769, in order to discover the source of the Nile, then by Lord Valentia and Salt in 1805, and subsequently, in 1810, by Salt alone, as Envoy of the British Government, it has since attracted the attention of many travellers.

Lord Valentia left behind him Pearce and Coffin. The former, after remaining many years in Northern Abyssinia, returned to Egypt, where he died. A narrative of the life and adventures of Nathaniel Pearce

was published in 1819. Coffin, we understand, is in Tigré to this day; he has completely adopted the native customs, and is a petty governor in Agame.

A country professing Christianity, but in which the pure doctrine of the Christian faith, and the moral habits which result from a right understanding of the Gospel, have been wholly forgotten,—a country, moreover, where, together with the nominal Christians, are mixed up a multitude of Mohammedans and Pagans, and where men are bought and sold like inanimate objects of merchandise, opened a fine field for missionary labours; and, accordingly, the Rev. Samuel Gobat and the Rev. Christian Kugler were dispatched by the Church Missionary Society. They landed at Massowah in December, 1829. Mr. Kugler died in Tigré in December, 1830, but his place was supplied by the Rev. Charles William Isenberg, who reached Adowa in April, 1835. He, again, was followed by the Rev. Charles Henry Blumhardt, in the beginning of 1837, and by the Rev. John Lewis Krapf at the close of the same year.

In the beginning of 1830 Mr. Gobat proceeded to Gondar, being the first European who has visited that capital since Bruce. He returned to Europe in 1833, and the result of his residence in Abyssinia was published in 1834, in a volume entitled Journal of a Three Years' Residence in Abyssinia.' In the following year he went back to Tigré, but in 1836 he was compelled to quit the mission from ill health. Messrs. Isenberg, Krapf, and Blumhardt remained at Adowa till the beginning of 1838, when, in consequence of the obstacles thrown in their way by the native priesthood, they were obliged to leave Abyssinia. The subsequent labours of the missionaries in Southern Abyssinia will be mentioned in the sequel; for the present, I will continue the list of travellers who have entered the country by Massowa.

In September, 1831, Dr. Edward Rüppell, a German naturalist of distinction, arrived at Massowa. He went by Atejerat and Takir-akkira to Gondar, and thence southward, as far as the bridge over the Abaï; and left Massowa, on his return to Europe, in the beginning of July, 1833.

M. Rüppel, who made two journeys into Abyssinia, was no ordinary traveller; for he brought to Europe a vast collection of animals, including many new species, which, having deposited in the public museum of his native city, Frankfort S. M., he described in a splendid work, which has thrown great light upon the natural productions of Nubia as well as of Abyssinia. It was in consequence of these well-matured results that, in the year 1838, five years after his return, the Royal Geographical Society awarded to him one of its gold medals.

Dr. Rüppell's jäger, named Martin Bretzka, was sent back to Abyssinia in 1835, and penetrated to Shoa about the same time as the French travellers next to be mentioned. He remained in various parts of Abyssinia for some years, collecting specimens in natural history.

Messrs. Combes and Tamisier, two French gentlemen, arrived at Massowa in April, 1835. They passed by Gondar, and through the country of the Wollo Gallas to Shoa, remained there for a short time, and then returned, going westward across the Abaï a short distance into Gojam, and then northward through Begemidir and Tigré. Their journey through Abyssinia occupied from April, 1835, to June, 1836. It might and ought to have afforded splendid additions to geography, as they were the first Europeans, since the time of the Portuguese, who had visited the greater portion of the districts through which they passed. As it is however, from the style in which their travels (in four volumes) are written, and from the fact that their route is merely adapted to Salt's map of Abyssinia, instead of serving, as it should have done, to the correction of its many imperfections, they have not obtained the credit they are entitled to for what they have really effected; and it was for a time doubted whether the southern portion of their journey was not altogether apocryphal. A late traveller, Dr. Beke, has it, however, in his power to prove their having actually been both in Shoa and in Gojam. Mr. Combes was at Zeïlah and Tajurrah towards the end of 1840, with the intention of penetrating to Shoa; but he was not permitted by the Somali and Danakil tribes to pass through.

The Baron von Kalte, a German, next reached Massowa, with the professed intention of penetrating south-westward into the countries beyond Abyssinia. In Hamazen, however, he was plundered of all he possessed, and reached Adowa with some difficulty, from whence, after a short stay there, he returned to the coast. He published a small work in German, under the title of 'Travels in Abyssinia in the Years 1836 and 1837;' but his whole stay in the country extended only over about three months at the end of the former year.

Two other Germans next appear as travellers in the same country, Dr. Schimper and Lieutenant Kielmaier. The precise dates of their arrival in Abyssinia cannot be stated; but it appears they were both in Adowa in the beginning of 1838, and were included in the decree of expulsion promulgated against the Church Missionaries. M. Kielmaier, who had, apparently, only recently arrived, quitted the country with the missionaries. Dr. Schimper, on the contrary, who must have arrived there at an earlier date, and have made friends in the country, remained there without molestation, and has in fact continued there

ever since, with the intention, as expressed by him, of ending his days in Abyssinia, he having, only last year, married an Abyssinian wife, according to the rites of the Church of Rome, of which he has lately become a member. This worthy and most amiable man is a native of Esslingen in Wirtemberg, who went to Abyssinia to collect specimens in natural history, principally botanical, for a society in his native town, and the collections he has made during a residence of several years in Tigré and Samen have probably exhausted the flora of Northern Abyssinia. He now talks of proceeding towards the south. His modest and retiring nature has prevented him from placing himself before the world, and thus becoming known as he deserves to be. During the last year, however, some very valuable and interesting communications from him to his society were published in the *Allgemeine Zeitung*, and have attracted much attention in Germany.

The return of Messrs. Combes and Tamisier to France appears to have turned the attention of their countrymen especially to Abyssinia, and since their time several other French travellers have visited almost every portion of the country. The first were Messrs. Dufey and Aubert, whose object in Abyssinia was to ascertain the mercantile capabilities of the country. They arrived at Massowa in June, 1837, and went together as far as Adowa, from whence Mr. Aubert returned, whilst Mr. Dufey went on to Shoa; from the latter place he returned, in August, 1838, to the coast, by a road previously untrod, across the country of Adel, reaching Tajurrah in the November following. Mr. Dufey subsequently died at Lobeio.

The brothers D'Abaddie, Antoine, and Arnault, arrived in Tigré in the year 1838, and proceeded to Gondar. Arnault thence went on to Gojam, where he remained for some time, and accompanied the prince of that country on a warlike expedition into the Galla districts of Kuthai and Liban, to the south of the Abaï. The elder brother returned to Europe for a short time, and, in 1840, again went to Abyssinia. No detailed account can be given of the operations in that country of the two D'Abaddies, who have both been moving about in various parts; but at the beginning of last year the younger was in Gojam, whither the elder was proceeding to join him. It is said that they contemplated going to Shoa. The elder brother has made numerous communications to the scientific world; by the latter, it does not appear that anything has yet been made public.

In June, 1839, Messrs. Lefevre, Dillon, and Petit (the first of whom previously made a short visit to Tigré) arrived at Massowah, professedly on a scientific expedition. Their movements are not very clearly to be traced. They arrived in Shoa in February or March,

1843; accompanied the king on one of his usual expeditions to the frontiers of Gurague and Enarea; returned thence to Ankober, and, in May, left the latter place for Duna in Gojam, by the route previously taken by Dr. Beke in 1841. From Duna they proceeded by Debra Weik and Mota to the broken bridge, where, in crossing the Abaï, Mr. Petit was unfortunately drowned. From thence Mr. Lefevre went to Gondar, and thence to Adowa, which place he left in July for Massowa and Egypt, where he arrived in October last. Mr. Dillon is since dead.

Messrs. Ferret and Galinier, two officers of engineers, were employed by the French government in surveying the whole of northern Abyssinia, from Hamazen to Gondar. The result of their labours has not hitherto been made public; but it can scarcely be doubted that it will be a work of great importance.

M. Vignaud, a student of the French Ecole des Mines, was in the country about the same time. He died at Jidda, on his way from Abyssinia, in last year.

About the time that these last-mentioned French travellers visited Abyssinia, the French government appointed a consular agent to reside at Massowa, and towards the end of 1842, M. de Goutin, the agent in question, visited Gondar, by direction of his government, in order to ascertain the advantages of opening a trade with that place.

Among the steps taken by the French government to connect Abyssinia with Europe, we must not forget to mention the important measure adopted by the Propagandists, for the union of that country with the See of Rome, viz., the establishment of a Roman Catholic mission to Adowa. As far back as 1838, a priest of that church, named the Padre Giuseppe Sapeto, entered Tigré, in company with the Messrs. D'Abaddie, the elder of whom, on his return to Europe, took with him a young Abyssinian priest to be educated in the College de Propaganda Fide at Rome. In 1841, Padre Sapeto having been recalled, Padre de Jacobis, a Neapolitan priest of the congregation of St. Francis de Paula, a man of great talent, was sent to Adowa, with the title of Apostolic Prefect in Abyssinia. He was accompanied by Padre Biancheri, a Genoese priest of the same congregation, the young Abyssinian priest already mentioned as having been educated at Rome, and an Italian lay-brother. Such is the present Roman Catholic mission in Abyssinia; and its establishment in that country, if the conduct of its members continues to be marked with the same talent and caution that have hitherto characterised their operations, is likely to be attended with results most important to the advance of civilization.

The government of Belgium likewise, with a view to ascertain the

opening which Abyssinia may afford for the manufactures of their country, dispatched thither M. Blondeel von Koelmbroeck, the Belgian consul-general in Egypt. This gentleman, who reached Massowa in 1839, went on as far as Gojam, from whence he returned to Egypt, by the way of Kuara and Sennar, in 1842.

Mr. Bell, a young officer of the Indian Navy, has also visited Abyssinia. He entered by the north, and proceeded southward towards Gójam. On his road, near Lake Fzana, he was attacked and severely wounded; and it was for a long time believed that he had died in consequence. But having recovered, he proceeded to Gójam, from whence he returned to Egypt in 1841. In May, 1843, he was a second time at Massowa, accompanied by a Mr. Plowden; and their intention was stated to be to attempt to penetrate southward to Enarea.

Mr. Parkyns reached Massowa shortly after Messrs. Bell and Plowden, with the intention of joining them. It is reported that Mr. Bell is again in Egypt, but nothing is said about Messrs. Plowden and Parkyns.

To the foregoing list has yet to be added a M. Even, a Frenchman, who entered Abyssinia by Massowa in 1841, and penetrated to Shoa, through Lasta (where he was robbed by the Prince of Waag), and the country of the Wollo Gallas. He remained at Ankober only a few days, and then returned northward: he is since dead.

These are, we believe, all the Europeans who have entered Abyssinia from the N. I shall now say a word of those who went into the country by the S.

The two church missionaries, Messrs. Isenberg and Krapf, after their expulsion from Tigré, decided on attempting to penetrate to Shoa across the country of Adel, a road till then unfrequented, as, at the time they set out for that purpose, M. Dufey had not yet traversed the country. They arrived at Tajurrah in April, 1839, five months after the French traveller had reached that place in safety, and proceeded westward to Shoa, where they arrived at the end of May. They were together till the following November, when Mr. Isenberg returned by Tajurrah to England. Mr. Krapf remained in Shoa till March, 1842, when he left it with the intention of proceeding to Egypt by way of Gondar and Massowa. He had already made considerable progress towards the former place, when he was stopped by hostilities in that part of the country, and he was obliged to retrace his steps to Gatira, the residence of a Galla chieftain, named Odara Bille (dependent on, or in close alliance with, the King of Shoa), by whom he was robbed of all he possessed. His despoiler not allowing him to take any other route, Mr. Krapf

now turned towards Massowa by another new road, passing through Arcgot, a fertile province of Central Abyssinia, principally in the possession of Galla tribes. He reached Massowa in May, 1842. Whilst Mr. Krapf was alone in Shoa, he accompanied the king on several expeditions into the Galla districts to the S. and W., respecting which he collected much valuable information; as he likewise did (from hearsay) of the countries lying yet further in the interior in those directions. His account of these latter countries is contained in the '*Monats Berichte*' of the Berlin Geographical Society; and the Church Missionary Society has recently published an interesting volume of the 'Journals of the Rev. Messrs. Isenberg and Krapf.'

Towards the end of 1842 Mr. Krapf, accompanied by Messrs. Isenberg and Muhleisen (the latter of whom had some time previously attempted to pass by the way of Tajurrah, but in vain), left Egypt with the intention of returning to Shoa. They reached Tajurrah on the 20th of December, 1842. But in consequence of orders from the King of Shoa to the Daukali tribes, they were not permitted to go forward. This event is greatly to be deplored, as, in consequence of it, and of Messrs. Isenberg and Muhleisen having been refused admittance into Tigré on their attempting to return thither in April, 1843, the British Church Mission in Abyssinia, which had existed since 1829, has been abandoned. Mr. Muhleisen has accordingly been transferred to the western coast of Africa. Mr. Krapf has gone to Brawa, in the hope of being able to penetrate from thence into the interior; and Mr. Isenberg remains for a while at Bombay, intending to join Mr. Krapf should there appear a prospect of success in the proposed direction.

After Messrs. Isenberg and Krapf, mention may be made of M. Rochet, who reached Shoa by the same route of Tajurrah, arriving there at the end of September, 1839. He remained in the country till March, 1840, when he returned by the way of Tajurrah to France, where, in 1841, he published his 'Voyage dans le Royaume de Shoa.' On leaving Shoa he brought with him various presents for the King of the French; and in 1842 he returned to that country, taking with him return presents. He arrived in Shoa in 1842; and at the departure of the British Mission from that country in the February following, he was still there.

The two travellers who followed immediately after M. Rochet, both died unfortunately before reaching Shoa. The first was Mr. Airston, an English gentleman, who proposed to pass through Shoa to Gondar, and thence return to Egypt by Sennar; he died, however at Ferri, the frontier town of Efat, in March, 1840.

Lieut. Kielmaier, who has already been mentioned as having been expelled from Tigré in 1838, went soon after Mr. Airston; but he had not reached more than half way, when he died at Wady Amailé, near Killelu, in April, 1840. These two travellers are not to be regarded as altogether the victims of a malignant climate, since the country between the coast and Shoa is far from being of an unhealthy character, as is indeed evinced by the numerous Europeans who have traversed it in perfect health and safety. Mr. Kielmaier was already in very bad health when he arrived at Tajurrah; and, having performed on foot the greater part of the journey to the place of his death, his strength was not sufficient to support the fatigue. Mr. Airston is stated by M. Rochet, who met him at Ferri, as having had an affection of the brain; and although M. Rochet rendered him every assistance in his power, he was compelled to leave him before he expired.

Dr. Beke was the next traveller: he arrived at Tajurrah on the 15th November, 1840; and in Shoa on the 5th February following: there he remained till October, when he went westward into Gójam. In that country he remained till February, 1843, when he returned by the way of Begemider, Lasta, and Tigré, reaching Massowa in the beginning of May last.

Major Harris's Mission.—In consequence of proposals of friendship made by Sahela Selassie, King of Shoa, to the government of India, the political mission to which I have alluded in the commencement of this subject, was dispatched to Shoa in the beginning of 1841, under the charge of Captain (now Major) Harris. He arrived in Shoa at the end of July, 1841, and remained there till the beginning of February, 1843.

Though a treaty of amity was entered into with the king, the articles of which are detailed in the work published by the gallant leader of the expedition, entitled the 'Highlands of Ethiopia,' it may reasonably be doubted whether a safe transit can yet be established between the Red Sea and the western frontier of Shoa, the distance being between 300 and 400 miles, and the intervening tract of difficult and rugged nature being occupied by lawless people.

Of this work of Major Harris * and his assistants, I may say that it familiarizes the general reader with the manners, customs, religion, and statistics of a people who claim to be the descendants of Solomon and the Queen of Sheba. From it we also learn, as well as from the memoirs of Dr. Beke, that large tracts of this region, particularly those lying to the W. of the Hawash river, are of volcanic origin; thus seeming to explain the probable cause of the great elevation of the

* Sir W. C. Harris since the Address was read.

plateau in which is situated the capital of Shoa. Though the language of his work is cast too much in the oriental style to accord with the taste of men of science, Major Harris has unquestionably the merit of having been the first to lay down precisely the longitude of Ankober, and thus to give a base from whence other geographers might extend their observations. He has also contributed various elements of positive knowledge concerning a country of whose interior we have hitherto been very ignorant. The contributions to natural history by Dr. Roth, naturalist of the expedition, are recorded in the Appendix.

The last traveller we have to mention is Mr. Charles Johnston,* who went up to Shoa in 1841 and 1842. He remained there till the departure of the mission of Major Harris, and accompanied it down to the coast. In his journey up the country he determined the latitude and longitude of Lake Abhibdad, and in a memoir recently read before this Society, he has speculated upon the manner in which its waters, constantly fed by the Hawash and, as he thinks, some southern streams, having no communication with the adjacent sea, are kept at a given level.

Thus no less than forty-two European travellers have visited Abyssinia within the last forty years.

Of all Abyssinian travellers since the days of Bruce, Dr. Beke, as an individual, having most improved our geographical acquaintance with that country, I may be permitted to say a few words explanatory of his labours, since they have not yet been presented to the public in a continuous work, and are known to us through documents confided to ourselves. He landed at Tajurrah in November, 1840, and left Massowa in May, 1843, having been exactly two years and a half in Abyssinia and the lowlands adjoining it. Krapf and others have gone over more ground.

In his arduous endeavours to construct a map of a large tract, Dr. Beke carried a series of thermometric levels across nearly seven degrees of longitude (from Tajurrah to Bauja), having been the first to ascertain the remarkable depression of the salt Lake Assal, which he roughly estimated at 760 feet (since ascertained by Lieut. Christopher to be 590) below the level of the sea: and he has fixed by astronomical observations the latitude of upwards of seventy stations.

Whilst in Shoa he visited and roughly mapped the watershed between the Nile and the Hawash, along a line of nearly fifty miles northward of Ankober, and he obtained information of the existence of the river Gojeb.

* Mr. C. Johnston has published his travels since this address was read.

After leaving Shoa, he proceeded westward across the Abaï, into the plateau of Gojam, where he remained, in all, a year and a quarter, so traversing it in various directions as to be able to construct a sketch map of the country.

He is the first traveller since the time of Bruce who has described the sources of the Abaï (the Nile of Bruce); (Mr. Arnault and Mr. Bell were both there before Dr. Beke, but have given no account of their visits;) and I rejoice to say, that he completely sustains the accuracy of the narrative of the great explorer of Abyssinia. By reaching the river Abaï at various points around Gojam and Damet, he has determined its course approximatively; and it may be mentioned that near Mota he discovered a second bridge over that stream, described by no previous traveller.

During a long stay in the neighbourhood of Baso, in the hope of being able to penetrate from thence southward, he collected information respecting the countries to the south of the Abaï, from which he has constructed a rough map comprising near 70,000 square miles of country, hitherto very partially explored by one of the brothers Abaddie, and as yet, of course, very imperfectly laid down.

On his way from Gojam to Massowa, Dr. Beke took a hitherto untrodden road; passing by Makkedera Mariam, Debra Trabor, Ebenat, and Sokota to Autálo; and from thence again by a route never travelled by other Europeans, round by Takirákirá (a place described by Rüppell) to Adowa. On this route he crossed the Takazi much higher up to the south than others had done, by which the course of that river in the maps is corrected; whilst by this *new* line, through the heart of Abyssinia, an important addition is made to the general map of that country. Dr. Beke's maps and journals have been handed over to the Royal Geographical Society, and a small portion of them has already been published in our Journal. Various other portions of the information obtained by him have appeared in the 'Friend of Africa,' published by the 'African Civilization Society;' but the greater mass, comprising a description of the manners and customs of the inhabitants, as well as his personal adventures, he is, I understand, now engaged in preparing for the press.

It may be added that he has collected vocabularies of thirteen languages and dialects spoken in Abyssinia, and the countries to the south, and he has made numerous drawings illustrative of the country and its inhabitants.

Thus upon the whole, although, for want of instruments and other means, Dr. Beke has not been able to construct a map of the country he

has visited with that degree of accuracy which numerous astronomical observations for longitude as well as latitude can alone ensure; it does appear that with very slight assistance from the Royal Geographical Society of England, and without receiving the slightest aid from Government, he has by his own efforts alone performed the duties of a zealous and inquiring geographer, and has made us much better acquainted than we were previously with the interior of Abyssinia—a country which is daily exciting fresh interest, and to which other European nations have sent as many travellers as ourselves.

As a proof, indeed, that this region, on which I have dwelt so long, is not neglected by geographers on the continent, I may refer you to the map recently published by M. Carl Zimmermann (Pyrits, 1843), on which are laid down, not only Abyssinia with the routes of the long list of travellers previously cited, but also vast adjacent tracts of Eastern and Middle Africa, from 1° S. of the Equator, to 16° S. lat., and from Cape Guardafui on the E., to 22° long. E. of Paris on the W. Though doubtless loaded with imperfections, this map is useful as a *résumé* of our present knowledge.

CENTRAL, SOUTH-EASTERN, AND SOUTHERN AFRICA.—The immense tract lying S. and S.E. of Abyssinia—extending on the N. from Zeila to Cape Guardafui; bounded on the E. by the Indian Ocean, from Cape Guardafui to the mouth of the Jub, or Juba, at the equator; and reaching thence to the S.W. angle of Abyssinia—is still nearly a geographical blank. Of this vast region, inhabited by Galla and Somauli tribes, we have nothing but vague accounts; and though it may be rich in productions which, advantageously for the natives and ourselves, we might exchange with the objects of our industry, and though situated in the vicinity of our Eastern territories, it is still all but a *terra incognita*. It would appear that rumours of the ferocity of some of the tribes have hitherto prevented our most daring explorers from penetrating these countries, though it is equally certain that, in some parts, their natives are a mild and hospitable race: such, more especially, are those described by Lieut. Christopher as living in a state approximating to that of the golden age. These people inhabit the lower course of a large river now known to us as Haines's River, a stream of great magnitude, and therefore possibly having its source somewhere in the mountains which form the southern boundary of the basin of the Hawash. Opinions, however, vary very much regarding this river. By one traveller it is supposed to be a branch of the Jub; but the examination of conflicting statements, based upon reports or hypotheses, does not become the President of this Society. We must therefore content our-

selves, for the present, with ascertained facts. Whatever, then, may be the case regarding the upper course of this river, Lieut. Christopher has shown that, in its lower course, it approaches to within about 10 miles of the sea, in lat. 1° 40′ N., and long. 44° 35′ E., at a place called Galwen, whence it runs parallel with the coast to Barava, a distance of 45 miles, and then diverging a little inland, finally empties itself into a lake having no known outlet. Between the river and the sea runs a range of sand-hills, about 200 feet high, through which it appears that much of the water reaches the sea by infiltration, as it is everywhere met with along the coast in this part, near the surface. On this fine river, grain is said to ripen all the year, and to yield from 80 to 150 fold: 1300 lbs. of *jowari* may be obtained for one dollar; and Lieut. Christopher is of opinion that, with proper cultivation, every luxury of the East might be there produced with facility.

Of the Jub, or Juba, we know nothing more than the mouth, with which, as mariners, we are necessarily conversant. From what we do know, however, it appears to be a large and navigable stream; and the natives on its banks, so far from entertaining any hostile feeling towards us, have invited our visits.

In a word, as I have already observed, we know little or nothing positive of the countries to the S. of Abyssinia; but there is every reason to hope that Mr. Krapf will be enabled to ascend the Jub from its mouth to its sources, and thus lay open to us the way into the interior, and clear up the many doubts that hang over these regions, and the water-courses by which they are intersected.

As concerns Southern Africa, properly so called, I cannot help regretting that, whether from the nature of the climate, the inhospitality of the natives, or from other causes, this region of the great continent (*i. e.* its interior) has been so little explored, though it is probable that our very learned associate, Mr. Cooley, from his extensive acquaintance with everything relating to Southern Africa, may be in possession of knowledge of which, in common with the mass of geographers, I am entirely ignorant. We have been told, indeed, that the late Mr. Canning, having been informed of the existence, in the archives of Lisbon, of certain documents relative to an habitual communication kept up by the Portuguese factories at Mozambique, and those at the Zaire, succeeded in obtaining translations of the same from Count Funchal, the then Portuguese ambassador to this country. Acting upon this information, Sir Robert Peel was applied to for a communication of this document, if it existed in the archives of the Foreign Office; and he immediately directed a search to be made in the various offices of the Government, but without

success. We have not been able to learn whether the supposed paper may not be in the possession of Mr. Canning's family. But surely, if the communication alluded to was formerly so practicable, we see no reason why the same route might not be again explored; and though we feel diffident, from motives of humanity, in recommending to travellers the perilous task of exploration in Africa, we may nevertheless, without violation of our conscience, say to those determined to travel in that country, that, as we have courts of adjudication by virtue of our treaties with Portugal, on the principal Portuguese settlements, on both the eastern and western coasts, and as we know that the Portuguese have pushed their explorations and influence far into the interior, the space which remains to be passed over, in order to connect the extreme colonies of the two coasts, is not so great that we may not hope to see the difficulty vanish before some enterprising traveller. Mr. Duncan, one of our countrymen, full of zeal and activity, though not professing to be very scientific, is indeed about to proceed to the west coast of Africa; and if, in his desire to explore the interior, he should select the line between Loando on the west and Mozambique on the east, and should accomplish his object, he will have the great distinction of being the first European who has made known the real nature of the axis of Southern Africa in so northern a parallel—our present acquaintance with it being confined to the coast, and a few hundred miles to the north of our own settlements at the Cape of Good Hope.

Whether Mr. Duncan may take the above route, or confine his explorations to the country of Koomessie and the Kong Mountains, east of Cape Coast, and to an excursion to the new settlement of Abbé Aceuta, inland from Baddagree, containing 30,000 souls, and where the missionary Crowther is now established, we are certain to reap some useful knowledge from his efforts. In alluding to Mr. Duncan, it must not be forgotten that he has already braved the dangers of the African climate, having been a volunteer on board the Albert, in the Niger expedition.

Miscellanea.

Physical Atlas of Berghaus.— It was justly observed by Mr. Greenough, in his last anniversary address to the Society in May, 1841, that "the only sound basis for geography in general is physical geography; all kinds of special geography being mere grafts upon this original stock." The truth of the observation must be so evident to all who consider the subject, as not to require that I should now enlarge upon it. Yet physical geography withal has never been studied, till of late years, as it deserves to be; and I am sorry to add that

it has made slower progress in our own than in almost any other country. It is, therefore, with peculiar satisfaction I am enabled to announce the publication of a work well calculated to call attention to the science of physical geography. Mr. Alexander Keith Johnston, of Edinburgh, during a tour of inspection to the several geographical and cartographic establishments of the continent, has made arrangements with M. Berghaus for the publication in English of that gentleman's 'Physical Atlas.' Of this valuable and most interesting work we have already seen a few sheets; they are larger than those published in Germany by M. Berghaus, and engraved and coloured in the most beautiful manner. The work will consist of thirty plates, each accompanied, on an average, by two pages of letter-press. The principal divisions of the subjects are Meteorology and Terrestrial Magnetism—Geology—Hydrography—Zoological Geography and Anthropology—and Phyto-Geography, or the distribution of plants. Each of these subjects will be again subdivided, so as to give a complete view of all the many important facts of physical geography. To the original maps of Professor Berghaus will also be added others by some of the most eminent philosophers of Edinburgh. On the whole Mr. Johnston's 'Physical Atlas' will not only be unique in this country, but most useful to the science we cultivate, and highly creditable to the zeal and enterprise of its spirited publisher.

Contour Maps, Relief Maps, and Models.—If a knowledge of the actual configuration of the surface of a country, with its multiform elevations and depressions, be essential to the study of physical geography, any means by which this configuration can be correctly represented must be of great value. On the most detailed topographical maps the heights and depressions can only be represented by lines which at best convey but inadequate ideas. The old mode of representing hills by etched lines of greater or less thickness, whether straight and single, or crossed and wavy, conveyed no distinct information as to the actual height of mountains and their absolute acclivity. Of late years, however, two systems have been introduced, that by contours and that of Lehman. Of the anaglyptic process, which is purely a mechanical process, I shall not speak. The method of representing the inequalities of the surface by lines of equal altitude was first suggested by Ph. Bouache and others (see Mémoires de l'Académie des Sciences, 1752, p. 399; 1753, p. 586; and 1756, p. 109), and again proposed by M. Dupain-Triel in 1784 (see Carte intitulée 'Nouvelle Méthode pour exprimer sur les Cartes les Hauteurs,' &c., avec un Mémoire de M. Du Caila: Paris, 1784); and again, 'Carte de la France, An 7 de la Rép.'

This method was introduced to public notice at the last meeting of the British Association, and was there generally approved. It has been very efficiently applied by Captain Larcom, R.E., to part of the Irish survey, and will, I doubt not, come into pretty general use. On these maps, as many of you must know, the hills, instead of being indicated by short strokes indicating the direction of the slopes, are shown by a number of continuous curves representing so many horizontal sections of the ground, at given and determined heights above each other. It is evident that the forms of these curves will vary according to the forms of the ground, which are thus brought before the spectator by these curved lines. These lines also point out at one and the same time the positive and relative heights of different places, and thus supply the most important data, both for the physical geographer, practical engineer, and geologist. The expense of merely contouring the maps after the levels have been taken, as in the case of the Ordnance Survey of Ireland, is found to be so trifling (less than a farthing per acre) as to lead us to hope that for the future all our topographical maps will be executed according to this excellent plan.

No one can call in doubt the importance of such a method of truly delineating natural outlines. In reference to geology, indeed, I must not omit this opportunity of stating that Sir Henry de la Beche brought the system into a very effective application to explain the structure of rocks, about two years ago, when he illustrated a mineral tract in South Wales belonging to the crown, which till then had been very little noticed. Applying different tints of colour to each contouring line, he showed how certain valuable beds were prolonged; how they contracted in one spot, and expanded in another; and he thus produced a picture of subterranean distribution, which is a document of high value to the crown.

It is needless to dilate on the national consideration to which the extension of this system is entitled, and we may hope to see all our richest mining countries similarly depicted. It is in fact the finishing stroke of geological labour, and proves, more effectively than volumes of writing, that without accurate details in physical geography the triumphs of geological anticipation can never be satisfactorily established.

The system of Lehman's, which with some modifications is pretty generally adopted in Germany, Russia, and Austria, consists in the adoption of a proportion between the thickness of the black lines and the white space left between them, which proportion is regulated by a scale, the first division of which, appropriated to slopes of 5°, has eleven times as much white paper left between the lines as the lines themselves are

thick; the next division is for 10°, in which the white is to the black as 10 to 2; the third division 9 to 3; and so on till we come to slopes of 30°, in which the proportion of black and white is as 6 to 6; beyond this the white spaces go on diminishing in width, while the thickness of the black lines increase, till for a slope of 60° the black is to the white as 11 to 1. This in theory is simple and ingenious, and a map engraved on this principle is not only beautiful in appearance, but, if correctly executed, affords, like the contour system, the means of obtaining a profile of the ground. Unfortunately, however, it is liable to many sources of error in practice, and therefore, generally speaking, approximates to real height and slope very little more than the old arbitrary method. The contour system seems to be the only one by which the real elevations and undulations of the ground can be represented on a flat surface. But even here an effort of the mind is necessary; the elements of a relief are there, but no relief is immediately pictured to the eye. Any doubt which may arise whether a contour represent an elevation or a depression is effectually cleared away by Captain Vetche's method of etching that side of the line on which the ground falls.

To obviate this last-mentioned defect, relief-maps have been invented: the first, I believe, appeared in Germany, and reference has been made in the addresses of my predecessors in this chair to maps of this kind.

In our own country Messrs. Dobbs and Co. have taken up the subject, and have given a very instructive small map of England and Wales geologically coloured. But although this and other very creditable productions by skilful artists have already appeared, the most beautiful map of the kind is unquestionably that just now completed—the Peninsula of Mount Sinai. Next to this will appear a Relief Map of Syria, for the correct execution of which the Board of Ordnance have very liberally allowed Messrs. Dobbs the use of Lieutenant Symonds's MS. maps and levels of part of that country, for which that distinguished officer was rewarded with one of the gold medals of this Society.

Whilst these relief maps, it cannot be denied, give a lively impression of the inequalities of the surface of the ground, some persons have contended that there is an inconvenience inseparable from them when employed in the instruction of youth, who might thereby be misled as to the real amount of elevations on the surface of the planet. But this objection seems to me to have little weight; since every good teacher would doubtless instruct his pupils that the elevations are necessarily over-magnified, in order to render them perceptible to the eye. He might indeed, without under-rating the value of a relief map, refer them to the caution of Sir John Herschel, who has justly observed, that the very

thickness of the paper with which an 18-inch globe is covered bears a greater proportion to the diameter of such a globe than the height of the Himalaya does to the earth.

The representation, therefore, in relief, of the mountains of our earth on an artificial globe, such as that by Mr. Kummer of Berlin, which was lately exhibited to the society, renders it necessary to magnify those heights beyond all natural proportion; and to a certain extent it is the same with relief maps of particular countries. Moreover, as no heights below a certain amount can be inserted so as to be at all sensible to the eye, an undulated country is erroneously represented as consisting of plains and prominent elevations. But again I say that under proper instructions such objections diminish, and with a due convention between master and scholar it may be perfectly understood, that no altitudes under a certain height are represented, and that all heights, though having a direct proportion to each other, bear no exact proportion either to the diameter of the earth or to the horizontal area displayed.

I have already dwelt too long on this subject, and now pass to topographical models. Of these there may be said to be two kinds, the first forming the passage, as it were, from the relief map to the perfect model. In these the portion of country is generally small, and all the irregularities of the ground are noted; the scale of heights is, however, as in the maps, different from the horizontal scale, so that such models do not give a perfectly correct representation of the country. In the perfect model the scale is the same for both the vertical and horizontal distances, everything is represented in its true proportions, and the whole is a correct miniature of nature. Of such models many are in existence in various countries; they are generally confined to small and particular localities, and are constructed for a particular purpose. Such are, among others, the admirable geological models of Mr. Sopwith, of the Forest of Dean, &c. Geographical models of far more extensive districts, however, have been constructed, and of regions much more difficult to represent. Of these, that of a portion of Switzerland by General Pfyffer, which you have all heard of, is now in the Museum of Lucern. Since the time of that ingenious officer the means of perfecting such objects have been greatly improved. After Pfyffer followed Eajaguet, who executed a model of the Valley of Chamounie, and then Gaudin, whose reliefs of Switzerland are in *papier maché*. But the most perfect, and in every respect beautiful models of any country, are those sculptured in wood by M. Sené. His first model is that of the Simplon, which, begun in 1830, was terminated in 1833, and after having excited the admiration of all Paris, was purchased by his Majesty Louis Philippe for 12,000 francs.

But the *chef d'œuvre* of M. Sené, which, it is expected, will be finished next year, is a model of all the higher Alps comprised between Martigny in the Valais, the Great St. Bernard, the Allée Blanche, the Seigne, the Tours, le Bonhomme, the Val de Monte Joie, the baths of St. Gervais, Chède, the rocks and Col d'Auterne, the Buet and Tête Noire, round to Martigny, a circle of sixty leagues. This district encloses the Mont Blanc in its centre. The scale of this model is 1 line for 12 toises, so that Mont Blanc, which is 2453 toises above the sea, will, in the model, be 29⅛ inches in height. Half a million of pine-trees of three different sizes, and many thousand houses, churches, &c. have been adjusted to the scale. The lakes are represented by blue steel, as coming nearer the real colour of these alpine reservoirs than anything else that has been tried. This astonishing model will be 20 feet long, and 14 feet wide; eleven years have already been devoted to its production; it is all cut with a gouge and other carving instruments, in blocks of the wood of the lime-tree, and every portion is from actual and repeated observations on the spot.

When this model is laid before them, natural philosophers will be better enabled to argue correctly upon the question of glaciers, recently brought into notice through the writings of Charpentier, Venetz, Agassiz, and Forbes.

Desiderata.—To enumerate even a small portion of geographical desiderata would occupy many pages, and it is not my intention on this occasion to enter further upon this subject than to request your attention to what I consider a very valuable suggestion of my accomplished friend Dr. Henry Holland. Formerly distinguished by his travels in Iceland and other works, and now laboriously occupied in the details of his profession, in which he occupies so eminent a place, Dr. Holland still contrives to pass over wide regions during his short vacations, on which occasions, though unable to work out geographical problems, he necessarily falls in with many undescribed features. Wishing to be of utility to others who may have more leisure than himself, and also desirous of increasing the connexions and usefulness of this Society, he has suggested a plan which the Council have adopted. A large book, having the title of *Desiderata*, now lies in your Meeting room, wherein every Member, or friend of a Member, may insert such queries or suggestions concerning particular objects of research, as may occur to them from their own sources of study, information, or observation. Few travellers of intelligence have visited a country without gaining notice of objects beyond what they themselves have had the opportunity to attain, and such notices must have considerable value when recorded as

they may now be, for the direction of future travellers in the same districts. It will be the duty of the officers to register and index these queries so that at all times the desiderata concerning any one tract of country can at once be referred to; and I entertain the hope that through this plan many Members of our Society, whether in public life or otherwise, too much occupied to become authors of long memoirs, will thus take a pleasure in uniting with us in pointing out new sources of information and inquiry. To exemplify the object of his plan, Dr. Holland has already inserted several valuable notices in the volume of Desiderata.

Forthcoming Memoirs.—In addition to all the memoirs which have been read before the Society, I have the pleasure to state that many good contributions are in our possession for future reading. Of these I may cite 'The Physical Geography of Lower Canada, by Mr. Wittich,' 'An Account of an Ascent of the Old Calabar River in Western Africa, by Dr. King,' 'A Description of the Island of St. Mary's in the Azores, by the Consul Mr. Carew Hunt,' 'The Recital of an Exploratory Journey to Lake Torrens, by Capt. E. C. Frome,' and 'A Memoir on Chinese and European Maps of China, by Mr. W. Huttman,' and 'Notes of Routes in Kutch Gundava, by Capt. Postans.'

To these, with many others which have yet to flow in upon us, I hope to call your notice at the ensuing Anniversary; and I merely now mention them to show that we are ourselves well supplied with literary materials; whilst our perspicuous and indefatigable Secretary will doubtless gather in and collate, as he has in this and preceding years, the copious results obtained by foreign geographers.

Conclusion.—We have now, gentlemen, reached the end of a report upon the recent progress of our science, which, long as you may consider it, is still, I know but too well, a very inadequate sketch of the labours of geographers during the single year which has elapsed, and those (certainly no members of our own body) who ask the question, whether much remains to be accomplished? may be assured, that the record of the next year will be quite as voluminous as that of the past. Great as modern advances have been, wide and varied is the field yet open to us and to posterity, for vast is the superficies of land not yet even glanced at by geographical pioneers, whilst much more enormous is the surface of the planet still excluded from the application of true scientific research! But why feel surprise in reflecting on such a fact, when we know that even in this highly cultivated country, it is only within these very few years that the true positions of the northern and western headlands of our islands were determined!

From what has been accomplished, then, let us turn cheerfully and hopefully to consider what may yet be done by a British Society for the extension of geographical knowledge, if fully and powerfully supported. To the vast desiderata in Australia, Africa, and parts of Asia, I have already adverted: and in conclusion I will now therefore briefly ask you what great discoveries might not be made in the vast continent of China, so recently opened by our nation to European enterprise? Referring you to what I have previously said concerning the probable distribution of precious ores in the northern portion of that empire, what vast benefits might not flow, both to our new allies and to ourselves, from competent surveys? But, alas! gentlemen, we actually present in our own body the refutation of the proverb, that "if there 's a will there 's a way." Where in the civilized world is to be found a knot of individuals pursuing science for its own sake, who have more vigorously displayed their devotion to the cause of geographical knowledge, or who have more freely sacrificed health and fortune in its attainment, than many of the members of the Society over which I have the honour to preside? There is, however, necessarily a limit to that which can be accomplished, when pecuniary means are wanting. Though, fortunately for us, travelling and colonizing are still as much the ruling passions of Englishmen as they were in the days of Raleigh and Drake, and though we are from time to time sustained by the recital of their gratuitous researches; still, unless a certain amount of steady income be at our disposal, the exertions of a society like this must be paralyzed, and their sphere of utility sadly diminished. Thus, as you well know, for a time we went on employing, at our own cost, scientific travellers competent to explore those tracts with which we most desired to become acquainted; but owing to increased expenditure, and a wish to husband our capital, chiefly with the view of purchasing a building for our place of meeting, our career of usefulness has, I regret to say, been checked; the disbursements having been restrained to payments for official management and the publication of our volumes.

I pointedly allude to this subject, not only because I trust my associates will redouble their exertions in procuring new adherents, through whose subscriptions our funds may be augmented; but also with the view of inciting Her Majesty's Government to afford some slight aid to a body, whose usefulness they must acknowledge, since their leading members belong to it, two of them having, indeed, already filled the Chair.*

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* The Earl of Ripon and General Sir George Murray.

If, independently of its volumes, and of the great stimulus it has given to many works of great national utility, this Society had done nothing more than procure maps of all known lands and seas, and so arrange them that they are at all times ready to be consulted by the Government and the public, it has by that act alone a most undoubted claim upon the country.

No great European kingdom, except England, is without some national establishment for general geographical purposes, and if, to fill that void, the Royal Geographical Society has accomplished the same end through its own energy and means, surely the least we are entitled to is some share, however limited, of a patronage which has been bestowed on other societies not more useful—none of them certainly so directly connected with the objects of the Government as ourselves. We do not ask for pecuniary aid, since the liberality and spirit of our members will, I doubt not, sustain our finances. But when he sees that we are cramped in our capacity for doing good, I fervently hope that before another anniversary arrives, the distinguished statesman—one of our own fellows —who, in presiding over Her Majesty's Government, has evinced by many acts that he is a true friend of science, will do for us that which he has already done for other bodies, in granting some apartment for the meetings of a Society exclusively devoted to the public interests, and of which Her Majesty is the Patron. By such an act he will save us a heavy annual outlay, and will enable us to apply a corresponding amount of our income to the real extension of geographical science.

This, Gentlemen, as far as I can see, *is the one thing only wanting* to ensure the continuance of a career which must be successful so long as it is sustained by the hearty co-operation of men who, disdaining all sordid considerations, are linked together in a noble pursuit, highly gratifying to themselves, and of the deepest importance to the progress of civilization.

NOTE.

M. D'Avezac has obligingly called our attention to a few inadvertences in the President's Address, which we therefore hasten to correct; we also add some further information supplied by our zealous correspondent.

Page lxxxiii, lines 19, 24, and 29, *for* Col. Denaix, *read* Col. Lapie.

,, lxxxiv, line 24, *for* is about to undertake, *read* has undertaken.

,, lxxxv, ,, 25, *for* M. Jomard we learn is, *read* The Viscount Santarem and M. Jomard, we learn, are.

,, ib., ,, 32, *for* M. Fontaine, *read* M. Fontanier.

,, cx, ,, 5. Messrs. Combes and Tamisier. A new map of the routes of these travellers in Abyssinia has been constructed from their notes, much more satisfactory than the one they had themselves prepared.

,, cxi, ,, 26. The brothers d'Abaddie. According to the latest news (date not mentioned), the elder d'Abaddie was in Gojam, and Arnaud d'Abaddie on the other side of the Abaï, to the eastward, separated from each other by civil wars.

,, cxii, ,, 8. M. Dillon. This gentleman died before the return of M. Lefebvre to Abyssinia.

,, ib., ,, 15. M. Vignaud was attached to the expedition of M. Lefebvre.