GEOGRAPHICAL NOTES.

IN the *Bulletin* of the California Academy of Sciences for June, Mr. C. M. Richter re-examines all the data relating to the ocean currents contiguous to the coast of California, with the result that existing charts are in many cases found to be wrong, and that great diversity of opinion exists as to the real character and origin of these currents.

IN the new number of the *Mouvement Géographique* the various rumours that have been afloat as to disasters which have happened to Mr. Stanley's Expedition are examined, and, when tested by known facts and the latest trustworthy information from Mr. Stanley himself and his officers, are shown to be without justification.

MR. MONTAGU KERR sailed from London last Thursday for Zanzibar, for the purpose of attempting to cross Africa by a new route. It is a mistake to refer to Mr. Kerr's private expedition as intended for the further "relief" of Emin Pasha. It has nothing whatever to do with Emin Pasha; though, no doubt, Mr. Kerr will shape his course through Masai Land towards Wadelai as his first stage, and may be guided by Emin's advice as to his further course. His main object after reaching Wadelai will be to proceed in a north-westerly direction towards Lake Chad, solving as far as possible by the way the hydrography of the Welle and Shari regions. After exploring around Lake Chad, Mr. Kerr may make for the Niger, though it is possible enough he will go on northwards in the direction of Tripoli. Since his return from his South African journey, Mr. Kerr has been diligently qualifying himself for scientific observation.

THE paper on Monday at the Royal Geographical Society was one of unusual originality; it described Mr. A. D. Carey's two years' journey around and across Turkistan and into the north of Tibet. Mr. Carey, who was accompanied by the well-known Central Asiatic traveller, Mr. Dalgleish, describes so many new features that it is impossible to follow his route throughout on any map. Although his route coincided to some extent with those of Prejevalsky, he has been able to supplement the Russian traveller's observations in many directions. Mr. Carey, starting from Leh in Ladak, crossed the western part of Tibet and the western continuation of the Altyn Tagh, to Kiria in the south-west corner of the great Tarim Desert. Thence along the Khoten River he reached the Tarim, the course of which he followed, with excursions to various places on the route, as far as Lob Nor. The hydrography of this interesting river Mr. Carey has helped considerably to clear up. Some time was spent about the Lob Nor region, and then Mr. Carey, amid many difficulties, endeavoured to penetrate as far as possible into Tibet; but as his time was limited he did not succeed in getting further than the Ma Chu, about half-way between the Kuen Lun and the Tangla Range. But in his wanderings to and fro in the great marshy and desert plain that lies between the Altyn Tagh Mountains and the Kuen Lun, he has added something to our knowledge of one of the most interesting regions of Central Asia. From the Ma Chu, Mr. Carey struck almost direct northwards by Sachu to Hami, across the Gobi Desert. Then by a great sweep he traversed the northern border of Turkistan, by Turfan, Karashahr, Kuchir, Aksu, and Yarkand, back to Leh, two years after he left it. As he says, he thus completed the circuit of Chinese Turkistan, and, Kashgar excepted, visited every important place in it. The chief characteristic of the country is its extreme poverty. It may be described as a huge desert fringed by a few small patches of cultivation. The only really good strip of country of considerable size is the western portion, comprising Kargalik, Yarkand, and Kashgar. To the north a succession of very small oases extends along the foot of the Tian Shan Mountains, the stretches of intervening desert becoming longer as the traveller goes further to the east. The eastern extremity of the province is desert pure and simple, and so is the southern extremity as far west as Kiria, with the exception of the small oases of Charchand and Chaklik. The central portion is chiefly desert, except along the Tarim and in the Lob Nor region. Mr. Carey gives some useful notes on the different classes of people he met with, and occasionally a jotting on the natural history of the region. But the chief scientific result of Mr. Carey's journey is the excellent map which Mr. Dalgleish carefully plotted every day, and which covers many sheets; it is being reduced, and will be published by the Royal Geographical Society.

THE correspondence from Major Barttlet, Mr. Stanley's second in command, from his station on the Aruwimi, shows that all is going well, and that if there are any dangers they will be due to the Arabs, and not to the natives. For the many rumours of disaster to the Expedition there is no foundation in fact; there is positively no news from Mr. Stanley since he left the Aruwimi, and in this case no news is good news, for bad news travels as rapidly in Africa as elsewhere.

THE ANNIVERSARY MEETING OF THE ROYAL SOCIETY.

THE Royal Society held its Anniversary Meeting yesterday for the purpose of electing officers and presenting medals. The President delivered the address which we print below. After the meeting the Fellows dined together at Willis's Rooms, and the attendance was larger than on any previous occasion, nearly 200 Fellows being present.

During the past year death has removed from us fifteen of our Fellows and one foreign Member. It is remarkable that no less than six of these had reached the age which the Psalmist takes for the extreme duration of human life, while the average age of the whole exceeds seventy-five years. Within two months after our last anniversary Sir Joseph Whitworth died, at the age of eighty-four. Starting from a humble beginning, he attained, through his talent and steady application, a commanding position among constructors of machinery and heavy ordnance, and the truth of surface and accuracy of dimensions of what came from his workshop are probably unrivalled.

Sir Walter Elliot, who was still older, combined a high official position in India with the pursuit of natural history, and was the author of several papers in scientific serials. John Hymers and Thomas Gaskin were mathematicians well known to Cambridge men of some standing, and were both elected Fellows of our Society nearly half a century ago. The former was the author of various mathematical text-books, which for a long time were those chiefly used in their respective subjects by Cambridge students for mathematical honours. The latter, once a colleague of my own in a mathematical honour examination, was famed for his skill in the solution of problems, though he has not left much behind him in the way of mathematical writings, beyond a book containing the solution of a variety of problems. In Robert Hunt we have lost an aged Fellow whose name is well known in connection with the study of the action of light in producing chemical changes, and on vegetation. In Joseph Baxendell we had a man who during a long life was a diligent observer of astronomical and meteorological phenomena. John Arthur Phillips, a geologist who attended most particularly to the chemical origin of mineralogical and geological phenomena, was the author of several papers, some of which appeared in our own Proceedings. It is not long since Sir Julius von Haast was among us, apparently in full vigour, having come to England in connection with the Colonial Exhibition, and now this distinguished geologist and naturalist is no more. The Earl of Iddesleigh was suddenly carried off in the midst of the duties belonging to an important office in the State, whilst Beresford-Hope has succumbed to an illness of some duration. These two joined us under the statute which enables the Council to recommend to the Society for election, in addition to the fifteen who are selected in the ordinary way, and nearly always on account of their scientific claims, persons who are members of Her Majesty's Most Honourable Privy Council, and whose ability is thus attested, though they are not usually men of science. From the list of foreign Members, one name has disappeared which has become a household word among the physicists of all civilized nations. The name of Kirchhoff will ever be remembered as that of the introducer, conjointly with Bunsen, of spectral analysis into the regular work of the chemical laboratory, a step which has been so fertile in results. To him too we owe the reference of the dark lines of the solar spectrum to the absorption of portions of light coming from deeper portions of the sun by the vapours of substances which in the condition of incandescent vapour themselves emit bright lines in corresponding positions; and to him therefore we are indebted for the detection of chemical elements in the sun and stars, though partial anticipations of these discoveries had been made by others. The fertility of these researches, and the attention which they consequently excited, should not make us

forget the many important investigations in mathematical physics of which Kirchhoff was the author.

The present year is memorable as the Jubilee of the reign of Her Most Gracious Majesty our beloved Sovereign, and the Patron of our Society. An address of congratulation on this auspicious event was prepared by the Council, and was graciously received by Her Majesty in Windsor Castle at the hands of your President, who was accompanied on that occasion by the senior Secretary.

It happens that this same year is also the Jubilee of the Electric Telegraph, if we date from the first construction of a telegraph on an actually working scale, as distinguished from preparatory experiments made only in the laboratory. The Jubilee was duly celebrated by the Society of Telegraph Engineers. The name of our former Fellow Wheatstone will go down to posterity as having occupied a foremost place in this great practical application of Oersted's fertile discovery.

I will just briefly allude to another outcome of scientific research. The last half-century was well advanced when our Fellow Dr. Perkin, by utilizing a colour reaction which had been employed by chemists as a test for aniline, laid the foundation of the industry of the coal-tar colours, which has now attained such great proportions, and the investigation of the chemical theory of which has occupied the attention of so many eminent chemists from our own Fellow Dr. Hofmann onwards.

There is yet another Jubilee connected with this same year in which our Society is if possible still more closely connected: it is now just 200 years since the publication of the first edition of that immortal work, "The Principia" of Newton. Some of the important results embodied in the Principia had previously been communicated to the Royal Society.

But, restricting our view to the last half-century alone, we can hardly help casting a glance at the progress of science, and of the practical applications of science, within that period. In electricity, I have already referred to the electric telegraph, now passed into the management of a department of the State, and inwoven in our daily life, with its wires stretching all round the earth like the nerves in the body, and placing us in immediate connection with distant countries. Much more recent than the invention of the electric telegraph is that, in some respects, still more wonderful apparatus for communication at a distance afforded by the telephone. The application of electricity to lighting purposes, of which we have availed ourselves for the lighting of the apartments of our own Society, is an industrial outcome of Faraday's discovery of magneto-electric induction which could not have been thought of when the account of that discovery first appeared in our Transactions. It is true that what I have just been mentioning with respect to electricity consists of industrial applications rather than the discovery of new scientific principles; but these industrial applications react upon abstract science beneficially in more ways than one. The possibility of useful applications induces theorists to engage in investigations which they might not otherwise have thought of, the result of which is oftentimes to lead them to a clearer apprehension of fundamental principles, and to induce them to undertake exact quantitative determinations of fundamental constants. Moreover, the grand scale on which apparatus for actual commercial use has to be constructed renders it possible for scientific men, through the courtesy of those who direct the construction, to make interesting experiments on a scale the cost of which would be quite prohibitory if it were a matter of science pure and simple. Take for example the experiments made by Faraday on the first cable prepared for the attempt to span over the Atlantic Ocean.

When we think of the progress of science, both abstract and applied, during the last half-century, we can hardly help speculating as to the possible increase of scientific knowledge half a century hence. Perhaps we might be tempted to think that the mine must have been so far worked that no great quantity of precious ore can still be left, except what lies too deep for human power to extract. Yet surely the progress of knowledge in the past warns us against any hasty conclusion of the kind. How often have accessions to our knowledge been made which were quite unforeseen and quite unexpected, and how can we say what great discovery may not be made at any moment, and what a flood of light may not result from it?

In what direction such discoveries may be made, it would be rash indeed to attempt to predict. Yet one cannot help thinking of one or two cases in which we seem almost in touch of what if we could reach it would probably give us an insight into the processes of Nature of which we have little idea at present. Take for example the theory of electricity as contrasted with the theory of light. In the latter we have the laws of reflection and refraction, which have long been known, the remarkable phenomenon of interference, the curious appearances which we designate by phenomena of diffraction. But all these fall in the most simple and natural way into their places when we have arrived at the answer to the question, What is light? which is furnished by the statement, Light consists in the undulations of an elastic medium. But we are not at present able to give a similar answer to the question, What is electricity? The appropriate idea has yet to be found. We know a great deal about its laws, and its connection with magnetism and chemical action; we are able to measure accurately physical constants relating to it; we make it subservient to the wants of daily life; and yet we are unable to answer the question what is it? Could we only give a definite answer to this question, it seems likely that the production of electricity by friction, electrostatic attractions and repulsions, the laws of electrodynamics, those of thermodynamics, the nature of magnetism, and magneto-electric phenomena would prove to be all simple deductions from the one fundamental idea. Nay more: so closely is electricity related to chemical action, that could we only clearly apprehend the nature of electricity, it seems not unlikely that an unexpected flood of light might be shed on chemical combination.

Let me refer to one other instance in which a large accession to our present knowledge seems not altogether hopeless. We know that when an electric discharge is passed through a given gas, or between electrodes formed of a given substance, an analysis of the spark reveals a usually complicated spectrum of bright lines characteristic of the chemical substances present. The arrangement of the lines in most cases seems capricious, while in other instances we have repetitions of lines, or else rhythmical flutings, indicative of law, though one of no simple character. There can be no reasonable doubt that the periodic times indicated by the bright lines seen in the spectrum are those belonging to the component vibrations of the chemical molecules themselves; and the appearance is just such as would be produced by a tolerably complex dynamical system vibrating under the action of internal forces of restitution. Now such a system may really be composed of two or more simpler systems, held together less firmly than the parts of one of the simpler systems; and the complex vibrations of the whole may be made up of those of the several simpler systems, modified, however, by their mutual connection, together it may be with others due to the mutual connection of the simpler systems regarded each as a whole. It is conceivable that relations of chemical composition may thus be pointed out even between substances which we deem elementary, and which from their great stability we may, perhaps, never be able actually to decompose.

But I must apologize for having taken up your time with speculations as to the future; I will turn now to some mention of the action of your Council during the past year, and of the progress made by Committees appointed by the Council.

In response to an invitation received from the Academy of Sciences of Paris, that the Society should be represented at the International Conference of Astronomers, which it was proposed should assemble in Paris, in the spring, for the purpose of deliberating about concerted action for obtaining a complete map of the starry heavens by means of photography, your Council requested the Astronomer Royal to represent the Society on that occasion. The Conference met, as it was proposed, last spring; and I believe that the English astronomers at least think that a good foundation has been laid for concerted action in that great undertaking.

As the Fellows are already aware from a circular which has been issued, the Council has decided to make a change in the mode of publication of the Philosophical Transactions. The average yearly volume is a good deal more bulky now than it was at the beginning of the century, and its size is such as not unfrequently to make it desirable to bind one volume in two. The sciences, moreover, which are represented in the Philosophical Transactions, divide themselves very naturally into two groups: mathematics, physics, and chemistry forming one, and the biological sciences the other. The Council has decided to issue the Transactions from henceforth in two series, corresponding to these two divisions, and a yearly volume will appear in each series. It is hoped that this arrangement will be conducive to an earlier publication, as the numeration of the pages in the two series can go on independently. The indi-

vidual papers will also be issued separately, so that Fellows who prefer receiving them in this way can have them as soon as they are printed. Moreover, the issue of the Transactions in two series will enable institutions that are concerned with one only of the two groups of subjects, and that are not on our list for free presentation, to purchase for their libraries the series devoted to that group, instead of going to the expense of procuring the whole Transactions.

I am happy to be able to announce that the publication of the *Challenger* Report is now nearly finished. Twenty-eight volumes, some in two parts, have now been published, and these are all in the Society's library.

The Krakatão Committee have now all but completed their labours. A vast amount of information on the phenomena related to that most remarkable volcanic explosion has been collected and digested, different branches of the inquiry having been taken up by different members of the Committee. An estimate has been made of the cost of publication of the Report, and the Council has decided that it should be published as a separate work, and has voted the sum required for publication. The printing of the volume is now far advanced, and in a very few weeks it will in all probability be in the hands of the public.

The reports of the observers of the total solar eclipse of August last year are now coming in. From inquiries I have made I am in hopes that they will all be in by the end of the year. It is obviously convenient that they should all be dealt with together, rather than appear in a scattered form for the sake of a slightly earlier publication of those which happen to be read first.

I mentioned in my last address that with respect to this eclipse the Council, acting in accordance with the recommendations of the Eclipse Committee, had decided to confine themselves to an expedition to Grenada, without attempting another to Benguela on the Western Coast of Africa, which if sent out from this country would have been a good deal more costly, and of which the success, judging by such accounts of the climate of Benguela and its neighbourhood as we could procure, seemed very doubtful. The Committee guaranteed, however, £100 towards the expense of a small expedition from the Cape in case Her Majesty's Astronomer at that place should be in a condition to organize one. Sir W. J. Hunt-Grubbe, the Admiral in command at that station, was prepared to render every assistance in his power. Ultimately, however, it was not found practicable to organize an expedition from the Cape, and so the English observations of the eclipse were confined to those taken at Grenada. I have heard that the day of the eclipse was fine at Benguela, but there were no astronomers of any nation there to take advantage of it. It may be doubted, however, whether, in spite of the fineness, the haze which is said to prevail so much on that coast at that time of year, might not materially have interfered with the observations.

The boring in the Delta of the Nile has been continued, by the favour of the War Office, under the able and zealous superintendence of Captain Dickinson, R.E. As I mentioned last year, the Committee thought it best to concentrate their efforts on a single boring until rock should be reached, or else a stratum of such a character as to show that the alluvial or drifted deposit had been got through. This result has not at present been obtained. The boring at Zagazig reached the depth of 324 feet, when the tube broke, and stopped for the time further progress. It is, however, a matter of interest and importance to know that the drift or deposit extends to so great a depth. Geologists attach so much importance to the prosecution of the inquiry that at the suggestion of the Delta Committee an application was made to the Government Grant Committee for a grant of £500, which was acceded to by the Committee. This sum would not suffice for the prosecution of the inquiry to the extent contemplated; but it was thought that with such a sum as a nucleus extraneous pecuniary assistance might be obtained from Societies or individuals specially interested in the inquiry, and the Council have authorized the Delta Committee to avail themselves of such aid.

The meetings of Council and Committees continue to be very numerous, and no less than twenty-two Committees and Sub-Committees have been at work during the session.

The number of papers communicated to the Society continues to increase. In 1884-85 the number was 93; in 1885-86 it was 113; and in the past session, 129.

Since the last Anniversary one complete part of the Philosophical Transactions, and thirty-two papers towards the new volume have been published; the whole comprising no less than 1482 pages of letterpress and seventy-six plates. In the same period twelve numbers of the Proceedings, containing 984 pages, have appeared.

The task of preparing the MS. of the Catalogue of Scientific Papers, decade 1874 to 1883, has proved far heavier than was anticipated, and the matter very far exceeds in bulk that of the previous decade. The cataloguing of papers from the volumes in our own library has long been finished, but the work of gleaning stray papers from works in other libraries which we do not possess has proved more arduous than was expected, and even now is not quite completed. It is confidently hoped, however, that the MS. will be completed for the press during the coming session.

The distribution and exchange of duplicates from our library commenced last session has been continued, and several defective series among the periodicals on our shelves have been made good. The general work of the library has received careful attention at the hands of Mr. Alfred White, who shortly before the last Anniversary was appointed to the office of Assistant Librarian.

The Copley Medal for the year has been awarded to the eminent botanist, your former President, Sir Joseph Dalton Hooker. It is impossible, within the limits to which I must confine myself on the present occasion, to do more than briefly refer to some of the more salient features of his scientific career, extending as it does over nearly half a century of unceasing intellectual activity; and I need hardly say that in attempting to give some idea of important labours which lie outside my own studies, I am dependent on the kindness of scientific friends.

As a traveller, he can perhaps only compare with Humboldt in the extent to which he has used travel as an instrument of research. To quote a remark by Prof. Asa Gray, "No botanist of the present century, perhaps of any time, has seen more of the earth's vegetation under natural conditions." His Antarctic voyage in 1839–43 supplied the material for a series of well-known works of first-rate importance on the vegetation of the southern hemisphere; and these in their turn formed the basis of important general discussions. The journey to India in 1847–51 yielded, in the Himalayan journals, as Humboldt has remarked, "a perfect treasure of important observations." The maps made of the passes into Tibet are even still unsuperseded. The fine work on the "Sikkim Rhododendrons" was at once a revelation to the botanist and to the horticulturist. His account of the glacial phenomena of the Himalayas supplied facts both to Darwin and to Lyell. A journey to Morocco in 1871 and a later visit to North America led to important conclusions on plant distribution.

Perhaps Sir Joseph Hooker's most important place in scientific history will be found in the rational basis upon which he placed geographical botany. De Candolle, while admitting the continuity of existing floras with those preceding them in time, still adhered in principle to the multiple origin of species. To quote a remark by Prof. Asa Gray, "De Candolle's great work closed one epoch in the history of the subject, and Hooker's name is the first that appears in the ensuing one." According to Lyell, "the abandonment of the old received doctrine of the 'immutability of species' was accelerated in England by the appearance in 1859 of Dr. Hooker's 'Essay on the Flora of Australia.'" This essay effected a revolution. It was quickly followed in 1860 by the classical essay on the "Distribution of Arctic Plants," and in 1886 by the Nottingham lecture on insular floras. The fact of widely *dissevered* localities for species, which De Candolle found an insuperable obstacle to abandoning the doctrine of multiple origin, has, in the hands of Hooker and A. Gray (as stated by Bentham), afforded the most convincing proof of the genetic relationship of the floras of which such species are components.

In systematic botany, Hooker has perhaps had no rival since Robert Brown. The "Genera Plantarum," the joint work of himself and his friend Bentham, and the "Flora Indica," to the completion of which our colleague is devoting the leisure of a well-earned retirement, form only as it were the head of an immense body of taxonomic memoirs.

Nor have his services to botanical science been confined to geographical botany and to taxonomy. His researches on various groups, such as *Welwitschia* and others, deal in a masterly way with morphological problems of the highest interest and of extreme difficulty.

While no one would attempt to minimize the commanding

and unique position of Mr. Darwin, the scientific historian of the future will recognize how much the development of the modern theory of evolution, from its first conception in the mind of Mr. Darwin, was facilitated by the interaction upon one another of the work and minds of Darwin, Hooker, and Lyell. It was due to the earnest efforts of his two friends that Mr. Darwin was induced to publish the first sketch of the origin of species at all. And no one, had he been alive, would have more cordially recognized than Mr. Darwin how vast an armoury of facts the wide botanical experience of Hooker constantly placed at his disposal in fortifying and supporting his main position.

Of the two Royal Medals, it is customary, though it is not an invariable rule, to award one for mathematics or physics, and the other for biological science.

The medal, which, in accordance with the usual rule, has been devoted to mathematics and physics, has this year been awarded to Colonel A. Clarke for his comparison of standards of length, and determination of the figure of the earth.

Colonel Clarke was for some twenty-five years the scientific and mathematical adviser for the Ordnance Survey, and whilst acting in that capacity he became known to the whole scientific world as possessing a unique knowledge and power in dealing with the complex questions which arise in the science of geodesy.

His laborious comparison of the standards of length, carried out under General Sir Henry James, R.E., are universally regarded as models of scientific precision.

His determination of the ellipticity and dimensions of the earth from the great arcs of meridian and longitude involved a very high mathematical ability and an enormous amount of labour. The conclusion at which he arrived removed an apparent discrepancy between the results of pendulum experiments and those derived from geodesy, and is generally accepted as the best approximation hitherto attained as to the figure of the earth.

The accounts of these investigations have been published in a number of memoirs, several of which have been communicated to the Royal Society.

In 1880 he published a book on geodesy, which, besides giving an accurate account of that science, embodies the main results of the work of his life.

In the biological division of the sciences the Royal Medal has this year been awarded to Prof. Henry N. Moseley for his numerous researches in animal morphology, and especially his investigations on Corals and on Peripatus.

The result of his elaborate investigations on Corals, an account of which has been published in the Philosophical Transactions, was to show that the Milleporidæ and the Stylasteridæ were not, as had been thought, Anthrozoan in nature, but were composite coral-forming hydroids. Many new genera and species were described by him in these memoirs, and in fact a new group of organisms, the Hydrocorallinæ, was not merely indicated, but the complete morphology and systematic subdivisions of that order were worked out.

Moseley's memoir on Peripatus is not less remarkable. He was the first to point out the true nature of this remarkable animal, and to demonstrate that it was in reality an archaic Arthropod. The subsequent investigations of Balfour and Sedgwick have further increased the importance of Moseley's discovery.

Moseley's memoir on the Land Planarians of Ceylon (Phil. Trans., 1872) is an important contribution to the anatomy of the Turbellaria. He was the first to apply the method of section-cutting to the Planarians, and his paper is full of new facts of great importance, which have stood the test of subsequent work over the same ground.

Besides these three great memoirs published in the Philosophical Transactions, Moseley has published numerous minor discoveries, and his spectroscopic observations on the colouring matters of marine organisms have proved the starting-point of valuable investigations.

Mention must not be omitted of Moseley's admirable book, "Notes of a Naturalist on the *Challenger*," which has been justly compared, for the varied ability, interest, and activity which it evinces on the part of the author, to Darwin's "Voyage of the *Beagle*."

Since the date of the works above referred to, Moseley has been chiefly active in the discharge of his duties as Linacre Professor, and the success with which he has directed the work of his pupils is evinced by the important memoirs on zoological subjects which several of them have produced whilst working under his direction. He has himself also published a remarkable discovery with regard to the Chitons. In the shells of many genera and species of these mollusks he has detected highly developed eyes, of which he has described the minute structure.

The Davy Medal for the year 1882 was awarded by the Council to Profs. Mendelejeff and Lothar Meyer conjointly, for their discovery of the periodic relations of the atomic weights. This relation, now known as "the Periodic Law," has attracted great attention on the part of chemists, and has even enabled Prof. Mendelejeff to predict the properties of elements at the time unknown, but since discovered, such as gallium for instance.

But while recognizing the merits of chemists of other nations, we are not to forget our own countrymen; and accordingly the Davy Medal for the present year has been awarded to Mr. John A. R. Newlands, for his discovery of the Periodic Law of the chemical elements. Though, in the somewhat less complete form in which the law was enunciated by him, it did not at the time attract the attention of chemists, still, in so far as the work of the foreign chemists above mentioned was anticipated, the priority belongs to Mr. Newlands.

SCIENTIFIC SERIALS.

Rivista Scientifico-Industriale, October.—On the crepuscular phenomena of 1883–84, by Prof. Annibale Riccò. These remarks are made in connection with the author's comprehensive work, now nearly ready for the press, on the remarkable after-glows of the years 1883–84. One of the chief conclusions arrived at in this work, after a careful consideration of all the evidence, is that the volcanic theory, first advanced by Mr. Norman Lockyer, is the only one that can be now accepted. The light-effects appeared soon after the great eruption of Krakatão on August 27, 1883, were propagated from the neighbourhood of the volcano to the most distant parts, and then gradually died out, precisely in the same way that similar manifestations were made immediately after the eruption of the island of Ferdinandea (Julia) in 1831. It is further concluded that the after-glows were due, not to the ashes or scoriæ ejected by Krakatão, but to the condensation of the aqueous vapours caused by the volcano, which condensation increased the quantity of solar light reflected by the atmosphere.

Bulletin de l'Académie Royale de Belgique, October.—On the mass of the planet Saturn, by L. de Ball. By a comparative study of its satellites, made at the Observatory of Cointe during the winter of 1885–86, the author finds the mass of Saturn to be 1/3492·8 that of the sun, which is rather less than the values obtained by Meyer, Hall, and Struve, which are 1/3482·5, 1/3481·3 and 1/3490·8 respectively.—Experimental researches on the sense of vision in the Arthropods, by Felix Plateau. Of this elaborate memoir the first part only appears in this issue, dealing first with the work already accomplished down to the year 1887 on the structure and functions of simple eyes; secondly, with the eyes of Myriapods. The four remaining parts, to be published in subsequent numbers of the *Bulletin*, will treat of vision in the spiders, and in larvæ generally; of the part played by the frontal eyes in perfect insects; of compound eyes and the perception of movements; with an anatomico-physiological summary, and experiments with insects.—Remarks on the total solar eclipse of August 19, 1887, by L. Niesten. A comparative study of the photographs obtained by MM. Niesten and Karelin at the station of Jurjewetz, shows that with Van Monckhoven's sensitive plates an almost instantaneous image is obtained not only of the protuberances but also of the corona; and further that a pose of thirty seconds gives no more detailed images of the corona than those obtained at the end of eight seconds. Hence it would appear that photographs of the corona obtained after an exposure of over a minute should be attributed to physical phenomena due to the atmospheric conditions, or to light-effects produced in the photographic apparatus itself.

SOCIETIES AND ACADEMIES.

LONDON.

Linnean Society, November 3.—W. Carruthers, F.R.S., President, in the chair.—Mr. J. H. Hart, of Trinidad, was elected a Fellow of the Society.—The President called attention