

At the time of these observations the liquid air used had probably become almost entirely liquid oxygen by the evaporation of the nitrogen. The figure, however, serves to check approximately that of the liquid oxygen.

In conclusion, we desire to express our thanks to Mr. J. E. Petavel for the assistance he has given to us in the above work. We hope shortly to be able to make a further contribution to this portion of the investigations on which we are engaged, on the electrical and magnetic constants of liquid oxygen, and which will include a determination of the dielectric constant of liquid oxygen, made with the object of determining the extent to which this substance obeys Maxwell's law connecting magnetic permeability, dielectric constant, and optical refractivity.

November 30, 1896.

#### ANNIVERSARY MEETING.

Sir JOSEPH LISTER, Bart., F.R.C.S., D.C.L., President, in the Chair.

The Report of the Auditors of the Treasurer's Accounts, on the part of the Society, was presented as follows:—

“The total receipts on the General Account during the past year, including balances carried from the preceding year, amount to £8,928 1s. 3d., and the total receipts on account of Trust Funds, including balances from the preceding year, amount to £5,009 0s. 2d. The total expenditure for the same period amounts to £7,287 12s. 3d. on the General Account (including £300 on loan to the Coral Boring Committee), and £3,347 11s. 7d. on account of Trust Funds, leaving a balance on the General Account of £1,605 9s. 4d. at the bankers (which includes £1304 17s. 3d. on deposit—Dr. Ludwig Mond's gift, £54 10s. Publication Grant Account, and £29 11s. 10d. Water Research Account), and in the hands of the Treasurer a balance of £34 19s. 8d.; leaving also at the bankers a balance on account of Trust Funds of £1,661 8s. 7d.”

The thanks of the Society were voted to the Treasurer and Auditors.

The Secretary then read the following Lists :—

Fellows deceased since the last Anniversary (Nov. 30, 1895).

*On the Home List.*

|                                 |                                    |
|---------------------------------|------------------------------------|
| Chambers, Charles.              | Mueller, Baron Ferdinand von       |
| Childers, Right Hon. Hugh Cul-  | K.C.M.G.                           |
| ling Eardley, F.R.G.S.          | Prestwich, Sir Joseph, D.C.L.      |
| Erichsen, Sir John Eric, Bart., | Reynolds, Sir John Russell, Bart., |
| F.R.C.S.                        | M.D.                               |
| Green, Alexander Henry, M.A.    | Richards, Sir George Henry,        |
| Grove, Right Hon. Sir William   | Admiral, K.C.B.                    |
| Robert, D.C.L.                  | Richardson, Sir Benjamin Ward,     |
| Harley, George, M.D.            | M.D.                               |
| Hind, John Russell, LL.D.       | Sharp, William, M.D.               |
| Humphry, Sir George Murray,     | Trimen, Henry, M.B.                |
| M.D.                            | Verdon, Hon. Sir George Frederic,  |
| Johnson, Sir George, M.D.       | K.C.M.G.                           |
| Martin, Henry Newell, M.A.      | Walker, James Thomas, General,     |
|                                 | R.E., C.B.                         |

*On the Foreign List.*

|                           |                       |
|---------------------------|-----------------------|
| Daubree, Gabriel Auguste. | Kekulé, August.       |
| Fizeau, Hippolyte Louis.  | Newton, Hubert Anson. |
| Gould, Benjamin Anthorp.  |                       |

*Withdrawn.*

Bateman, James, M.A.

Fellows elected since the last Anniversary.

|                                   |                                  |
|-----------------------------------|----------------------------------|
| Clarke, Lieut.-Colonel Sir George | Murray, John, Ph.D.              |
| Sydenham, R.E.                    | Pearson, Prof. Karl, M.A.        |
| Collie, J. Norman, Ph.D.          | Stebbing, Rev. Thomas Roscoe     |
| Downing, Arthur Matthew Weld,     | Rede, M.A.                       |
| D.Sc.                             | Stewart, Prof. Charles, M.R.C.S. |
| Elgar, Francis, LL.D.             | Temple, Sir Richard, Bart.,      |
| Gray, Prof. Andrew, M.A.          | G.C.S.I.                         |
| Hinde, George Jennings, Ph.D.     | Wilson, William E.               |
| Miers, Prof. Henry Alexander,     | Woodward, Horace Bolingbroke,    |
| M.A.                              | F.G.S.                           |
| Mott, Frederick Walker, M.D.      | Wynne, William Palmer, D.Sc.     |

*On the Foreign List.*

|                           |                         |
|---------------------------|-------------------------|
| Gaudry, Albert.           | Lie, Sophus.            |
| Heim, Albert.             | Metschnikoff, Elias.    |
| Kohlrausch, Friedrich.    | Mittag-Leffler, Gösta.  |
| Langley, Samuel Pierpont. | Schiaparelli, Giovanni. |
| Lippmann, Gabriel.        |                         |

The President then addressed the Society as follows:—

Nineteen Fellows and five Foreign Members have been taken from the Royal Society by death since the last Anniversary Meeting.

The deceased Fellows are—

John Russell Hind, December 23, 1895, aged 73.

The Right Hon. Hugh Culling Eardley Childers, January 29, 1896, aged 69.

General James Thomas Walker, February 16, 1896, aged 69.

Charles Chambers, March, 1896, aged 61.

William Sharp, April 10, 1896, aged 91.

Sir John Russell Reynolds, May 29, 1896, aged 68.

Sir George Johnson, June 3, 1896, aged 78.

Sir Joseph Prestwich, June 23, 1896, aged 84.

The Right Hon. Sir William Robert Grove, August 2, 1896, aged 85.

Alexander Henry Green, August 19, 1896, aged 64.

The Hon. Sir George Frederic Verdon, September 13, 1896, aged 62.

Sir John Eric Erichsen, September 23, 1896, aged 78.

Sir George Murray Humphry, September 24, 1896, aged 76.

Baron Ferdinand von Mueller, October 9, 1896, aged 71.

Henry Trimen, October 18, 1896, aged 53.

George Harley, October 27, 1896, aged 67.

Henry Newell Martin, October 28, 1896, aged 44.

Admiral Sir George Henry Richards, November 14, 1896, aged 76.

Sir Benjamin Ward Richardson, November 21, 1896, aged 68.

The Foreign Members are—

Gabriel Auguste Daubrée, May 29, 1896, aged 82.

August Kekulé, July 13, 1896, aged 66.

Hubert Anson Newton, August 12, 1896, aged 66.

Hippolyte Louis Fizeau, September 18, 1896, aged 77.

Benjamin Apthorp Gould, November 27, 1896, aged 72.

Although biographical notices of nearly all will be found in the 'Proceedings,' there are some to whose labours I may make brief reference to-day.

Sir William Grove presented the rare spectacle of steady and distinguished devotion to science in spite of the claims of an exacting profession. Grove was an eminent lawyer. Called to the bar in 1835, he was for some time kept from active work by ill health; but he subsequently acquired a considerable practice, and becoming a Queen's Counsel in 1853, was for some years the leader of the South Wales Circuit. His practice was mainly in patent cases, and the reputation he obtained in that field led to his being appointed a member of the Royal Commission on the Patent Laws. His work as an advocate was, however, by no means confined to such matters; he was one of the counsel—Serjeant Shee and Dr. Kenealy being the others—who defended the Rugeley poisoner, William Palmer, and he was engaged in many other *causes célèbres*.

The eminent position to which he had risen at the bar led to his appointment in November, 1871, as a Judge of the old Court of Common Pleas, a post which in 1875 was converted by the Judicature Act into that of a Judge of the High Court. This office he held until his retirement in 1887, when he became a member of the Privy Council.

Throughout the greater part of his long and distinguished legal career, Grove's love of science impelled him to devote a large share of his energies to its pursuit. It is remarkable that his first paper, which was communicated to the British Association in 1839, and which also appeared in the '*Comptes Rendus*,' and in Poggendorff's '*Annalen*,' contained a description of the "Grove's cell," which was afterwards used in every physical laboratory in the world. This was succeeded by a long series of memoirs, chiefly on electrical subjects, among which one of the best known is that on the gas battery. In 1842 he delivered, at the London Institution, an address which was, in the following year, developed into the celebrated series of lectures: "On the Correlation of Physical Forces." In these he discussed what we should now call the transformations of energy; and, though Professor Tait, in his "Historical Sketch of the Science of Energy,"\* assigns precedence in calling "attention to the generality of such transformations" to Mrs. Somerville, there can be no doubt that Grove was an independent and very advanced thinker on that subject.

For many years Sir William Grove took a very prominent part in the affairs of the Royal Society, and was one of the most active promoters of the reform of its constitution, which took place in 1847. It is largely to his efforts that we owe our present system of electing only a specified number of Fellows in each year. He was also one of the founders of the "Philosophical Club."

He was President of the British Association in 1866, and, in the

\* '*Thermodynamics*,' p. 58.

course of his address, observed: "The Kew Observatory, the petted child of the British Association, may possibly become an important national establishment; and, if so, while it will not, I trust, lose its character of a home of untrammelled physical research, it will have superadded some of the functions of the Meteorological Department of the Board of Trade, with a staff of skilful and experienced observers."\* Although the British Association long ago handed over the care of its "petted child" to a Committee appointed by the Royal Society, the Society and the Association have lately appointed a joint Committee to urge the Government to supply the funds for converting the Kew Observatory into a "national establishment" similar to the Reichsanstalt at Charlottenburg. We are thus striving to realise to-day the suggestion thrown out, thirty years ago, by Grove.

In Sir Joseph Prestwich we have lost almost the last link that remained which connected geologists of the present day with the founders of the science in the first half of this century. To him we are indebted, not only for the first comprehensive classification of the tertiary beds of this country—to several of which he assigned the names by which they will henceforth be universally known—but, also, for their correlation with the strata of the Paris Basin. To him, also, is due the credit of having been the first to establish the authenticity of the remains of human workmanship found in the drift-deposits of the valley of the Somme, and of thus having laid secure foundations on which arguments as to the extreme antiquity of man upon the earth may be based. In France his name was known and respected as much as in England, and it would be hard to say how much of the advance in geological knowledge during the last sixty years was not due to his unintermitted labours, which extended over the whole of that period.

The earliest scientific investigation of Armand Hippolyte Louis Fizeau was on the use of bromine in photography, and was published in 1841. He will always be remembered as the first who carried out experiments designed to measure the velocity of light produced by a terrestrial source, and travelling through a comparatively small distance near the surface of the earth. These observations, made in 1849, were very difficult; but the value of the method employed is attested by the fact that a quarter of a century afterwards it was adopted by M. Cornu, and that with the improved apparatus employed by him it gave results of the highest accuracy.

A few years afterwards Fizeau performed another classical experiment by which he measured the change in the velocity of light produced by the motion of the medium in which it travels.

\* 'Correlation and Continuity.' Fifth Edition, 1867, p. 278.

He also devised an extremely delicate method (based on the interference of light) of determining the coefficients of thermal expansion of small bodies, such as crystals. The instrument he designed has been carefully studied by the Bureau International des Poids et Mesures, with very satisfactory results.

On account of these and other researches, M. Fizeau has, for nearly half a century, occupied a conspicuous position among European physicists. He was awarded the Rumford Medal in 1866, and became a Foreign Member of the Royal Society in 1875.

Our distinguished Foreign Member, Professor Hubert Anson Newton, Senior Professor of Mathematics at the Yale University, New Haven, died at his home in New Haven on the 12th of August last. He was born at Sherbourne, in the State of New York, in 1830; studied at Yale College, where he graduated in 1850, and was called to the Chair of Mathematics in the University at the early age of twenty-five.

On the organisation of the Observatory of the University in 1882, Professor Newton was appointed Director; and though he resigned this position in 1884, the whole policy and success of the Observatory ever since, and, indeed, its very existence, are in no small measure due to his warm interest and untiring efforts.

Professor Newton's name will ever remain associated with his important researches on Meteor Astronomy, beginning as early as 1860, and with his inquiry into the possible capture of comets by Jupiter and other planets. His historical investigations, and discussions of the original accounts, showed that the phenomena of meteor showers are of a permanent character, and come within the range of Celestial Dynamics, and that predictions of returning meteoric displays are possible.

Professor Newton was President of the American Association for the Advancement of Science in 1885, and was for many years an Associate Editor of the 'American Journal of Science.' He was a man of noble character, held in universal esteem, and greatly beloved by all those to whom he was personally known.

The death of August Kekulé will be felt as a severe loss to chemical science all over the world. Not only did his great activity in original research enrich organic chemistry with many new and interesting compounds, but his announcement of the tetradic valency of carbon, and, especially, his theoretical conception of the benzene ring, gave an impulse to the study of structural chemistry which has introduced order into the vast array of organic compounds, both of the alcoholic and aromatic types, and has not, even yet, expended itself. In recognition of his life-long work, the Council of the Royal Society awarded Professor Kekulé the Copley Medal in 1885.

Another Foreign Member who has passed away from us during

the year is the distinguished mineralogist and geologist, M. Daubrée. After leaving the *École Polytechnique* in 1832, he was sent on a mission to investigate the modes of occurrence of tin-ore in Cornwall and on the Continent. His reports showed such ability that he was appointed Professor of Mineralogy and Geology at Strasburg, at the age of 25; afterwards (1861-2) he became Professor of Geology at the *Musée d'Histoire Naturelle* at Paris, and at the same time Professor of Mineralogy at the *École des Mines*; in the same year he succeeded to the Chair at the *Institut* vacated by M. Cordier. From 1872 to 1884, when the rules of the Service made retirement by reason of age compulsory, he acted as Director of the *École des Mines*. M. Daubrée was the leader in France in experiments for the synthetic reproduction of minerals and rocks, and his laboratory furnace was the first to yield crystals of oxide of tin having the lustre, colour, and hardness of the mineral cassiterite; his memoir on the zeolites and other minerals, produced since Roman times through the action of the hot springs of Plombières on the bricks and concrete, has been of general interest both to mineralogists and geologists. Other important experiments led him to infer that circulating water, rather than heat or vapours, has been the essential agent in all phenomena of rock transformation. M. Daubrée gave much attention to the description and classification of meteorites, and made numerous experiments relative to the reproduction of material having similar characters.

The Council was much occupied during the earlier part of the session with the consideration of the proposed "Standing Orders" relating to the conduct of the meetings, and to the Publications of the Society—a subject which has engaged the anxious attention of previous Councils. In framing these Standing Orders two principal objects were kept in view. Firstly, to increase the interest of the meetings by giving greater freedom in the conduct of them, and by enlarging the opportunities for discussion; and secondly, to obtain a more secure, and, at the same time, more rapid judgment as to the value of communications made to the Society; so that, while the high standard of the 'Philosophical Transactions' is retained, or even raised, greater rapidity in the publication of these and of the 'Proceedings' may be attained. To secure these latter objects, the Council has called to its aid, in the form of Sectional Committees, a number of Fellows much greater than that of the Council itself, to whom will be entrusted the task of reviewing the communications to the Society, and of making to the Council such recommendations with respect to them as may seem desirable. It is further probable that by using the special knowledge of the several Sectional Committees in the detailed consideration of special questions, the Council will have more time at its disposal than it has at present

to consider the matters of larger policy which are so frequently brought before it.

It soon became evident that no satisfactory Standing Orders securing these advantages could be drawn up which would not be in some way or other inconsistent with the Statutes at present in operation. It was accordingly resolved to modify the Statutes; and this has been done by giving to certain Statutes a more general form than that in which they have for a long time appeared, so that such alterations of detail as may from time to time seem desirable may be effected by changes in the Standing Orders only, without interfering with the Statutes. I gladly avail myself of this opportunity of acknowledging the great help which the Council received from Mr. A. B. Kempe, in respect to the many legal points which arose in connection with the change of Statutes. A copy of the Statutes, as amended during the present session, as well as of the Standing Orders adopted, will be found in the Year-book, which has been instituted by one of the new Standing Orders, and which will be published each year, as soon after the Anniversary Meeting as possible.

The International Conference called to consider the desirability and possibility of compiling and publishing, by international co-operation, a Complete Catalogue of Scientific Literature, was duly held; and the Society may be congratulated on the successful issue of a meeting, to the preparations for which a special International Catalogue Committee, appointed by, and acting under the authority of, the Council, had devoted much time and labour. The Conference met in the apartments of the Society on July 14, 15, 16, and 17, under the presidency of the Right Hon. Sir J. Gorst, Vice-President of the Committee of Council on Education, and was attended by forty-one delegates, representing nearly all countries interested in science. The Society was represented by the Senior Secretary, Professor Armstrong (Chairman of the International Catalogue Committee), Mr. Norman Lockyer, Dr. L. Mond, and Professor Rücker. Four other Fellows of the Society, General Strachey, Dr. D. Gill, Professor Liversidge, and Mr. R. Trimen were among the delegates appointed by the Indian and Colonial Governments.

The Conference resolved that it was desirable to compile and publish a catalogue of the nature suggested in the original circular issued by the Royal Society, the administration being carried out by a Central International Bureau, under the direction of an International Council, with an arrangement that each of such countries as were willing to do so, should, by some national organisation, collect and prepare for the Central Bureau all the entries belonging to the scientific literature of the country. It was further resolved that the language of the catalogue should be English, and a proposal that the Central Bureau should be placed in London was carried by



acclamation. The Conference finding itself unable to accept any of the systems of classification proposed, requested the Royal Society to form a committee which should consider this and other matters which were left undecided by the Conference. The Council are already taking steps to perform the duties thus entrusted to them by the Conference.

The delegates of the Society reported that the whole proceedings of the Conference were carried on with remarkable good feeling, and even unanimity, and that the confidence felt and expressed by the various delegates in the fitness of the Royal Society to complete the work begun by the Conference was most gratifying.

In connection with the fact that the proposed International Catalogue is to be in part arranged according to subject matter, it may be stated that the Council, acting upon a resolution of the International Catalogue Committee, have taken steps towards the practice of appending subject indices to the papers published by the Society, and have recommended the same practice to other Societies.

The work connected with the Society's own Catalogue is progressing. Vol. XI, the last of the decade 1874-83, has been published, and the preparation of the Supplement, which has been found necessary for this and preceding decades, is being pushed on.

For the Subject Index to the Catalogue, slips have been prepared, and the Catalogue Committee will soon have to advise the Council as to the system of classification to be adopted.

The Grant of £1000 in aid of publications, which My Lords of the Treasury promised last summer to place upon the Estimates of this year, has been sanctioned by Parliament, and a moiety of it has already been paid to the Society. The Council have already felt the great advantage of having this money at their disposal, and have framed Regulations for its administration which they trust will be found to work satisfactorily.

The Council have made some small changes (which have been approved by My Lords of the Treasury) in the Regulations for the administration of the Government Grant of £4000 in aid of Scientific Inquiries, directed chiefly towards more effectually securing that Grants made should be expended for the purpose for which they were given, and that objects of permanent interest obtained by Grants should be properly disposed of. The only two Grants made this year which call for special mention are that of £1000 to the Joint Permanent Eclipse Committee of the Royal and Royal Astronomical Societies, for observations of the Solar Eclipse of August, and that of £800 for boring a coral reef in the Pacific Ocean, administered by the Committee appointed by the Royal Society, both drawn from the Reserve Fund.

The Expedition to bore the Coral Reef received valuable assistance

from My Lords of the Admiralty, who directed H.M.S. "Penguin" to carry the observers from Sydney, N.S.W., to Funafuti, the seat of the boring, and to render the Expedition all possible help during the whole of the operations. I desire to express on behalf of the Society our recognition of this renewed token of the willingness of My Lords of the Admiralty to further scientific inquiry. Though the full Report of the Expedition has not yet reached the Council, information has been received to the effect that the boring operations had to be suspended when a depth of only 75 feet had been reached; a layer of sand and boulders presenting obstacles which the experts employed were unable to overcome. It is much to be regretted that an undertaking which promised scientific results of very great value has thus so far failed.

The appeals of the Council to H.M. Minister for Foreign Affairs and to My Lords of the Admiralty for assistance to the Eclipse Expeditions met with most cordial and effective response, for which we would express our gratitude. We also desire to acknowledge the courtesy shown and help afforded to the observing parties in Norway and Japan by the respective Governments of those countries, and to record our high appreciation of the enthusiastic and effective aid given to those under the direction of Mr. Norman Lockyer, at Vadsö, by Captain King Hall and the Officers and crew of H.M.S. "Volage"; to Dr. Common, also in Norway, by Commodore Atkinson, of H.M.S. "Active"; to the Astronomer Royal's party, in Japan, by the Officers of H.M.S. "Humber," "Pique," and "Linnet," kindly detached by Admiral Sir A. Buller to convey the various members of the expedition to and from Yezo, and to aid them during the observations.

Both in Norway and in Japan unfavourable weather rendered to a large extent nugatory the elaborate preparations which had been made for observing the eclipse. But British astronomy was splendidly saved from failure on this important occasion by the munificence and public spirit of Sir George Baden Powell, who fitted up, at his own expense, and accompanied an expedition in his yacht "Otaria" to Novaya Zemlya. The instruments employed were provided by our Fellows, Mr. Lockyer and Mr. Stone, of the Radcliffe Observatory, Oxford; and the observations were entrusted to Mr. Shackleton, one of the computers employed by the Solar Physics Committee. In brilliant weather photographic observations were made, which promise to yield novel results of a highly important character.

At the request of the President of the Board of Trade the Council nominated, in March, Professors Kennedy and Roberts-Austen as two members of a Committee to investigate the loss of strength in steel rails. So far as I am aware, the Committee has not yet made

its report. More recently, in July, the Council, at the request of H.M. Secretary for Colonial Affairs, appointed a Committee to consider, and if necessary to investigate, in conjunction with Surgeon-Major Bruce, who has made important researches in the matter, the disease caused in cattle in Africa by the Tsetse Fly. The Committee is still engaged on the inquiry.

We believe that the Council, in cordially responding to requests like the above, and in freely placing at the disposal of H.M. Government its scientific knowledge and its acquaintance with scientific men, is performing one of its most important functions. The Council of the Royal Society is again and again called upon to approach H.M. Government on behalf of the interests of science, and when it does so always meets with a cordial reception and a respectful hearing, even on occasions when public necessities prevent a favourable reply being given to its requests. In return, the Council believes it to be its duty (when called upon to do so), not only to place its own time and labour ungrudgingly at the service of H.M. Government, but also to ask for the co-operation of other Fellows of the Society, or even other scientific men not Fellows of the Society, feeling confident that whenever the matter in hand has practical bearings beyond the simple advancement of Natural Knowledge, the value of a scientific man's time and energy will be duly considered.

Some correspondence has taken place with the War Office relative to resuming the borings in the Delta of the Nile, which were carried on for a time some years ago, and which, though not completed, yielded valuable results. The Expedition to the Soudan has, however, prevented anything being done. The Council learn with pleasure that the old borings, undertaken for a purely scientific object, have indirectly been a valuable means of supplying certain districts of the Delta with sweet water.

If anything had been needed to justify the meetings for discussion recently established, it would have been supplied by the brilliant success of that held during the present session on Colour Photography. On that occasion, M. Lippmann gave us a demonstration of results of unprecedented beauty, obtained by extremely simple means, though based on profound mathematical reasoning. Such meetings can only prove fruitful when they are held in consequence of some theme needing such a discussion as is afforded by a special meeting; and their occurrence must therefore be uncertain and irregular. The purpose for which they were instituted would be frustrated if they were held at times fixed in any formal way, irrespective of whether they were needed or no.

Three of the informal gatherings recently instituted, limited to Fellows of the Society, have been held during the session, and were judged to be very successful.

The Council has had occasion during the past session to present an address of condolence to Her Majesty, the Patron of the Society, on the lamented death of Prince Henry of Battenberg, and to the Royal Academy on the occasion of the death of their President, Lord Leighton. In the absence of Council, during the recess, I sent another message of sympathy on the death of Sir J. Millais.

I had the privilege of presenting on behalf of the Council, an address of congratulation to our late President, Lord Kelvin, on the occasion of his Jubilee, nobly celebrated in Glasgow last summer, by a very remarkable concourse of scientific men from all parts of the world, assembled to do him honour.

Addresses were also sent to our Foreign Member, Professor Cannizzaro, on the celebration of his seventieth birthday, and to the University of Princeton, New Jersey, U.S.A., on the occasion of its Sesquicentenary Anniversary.

Under the guidance of the Scientific Relief Committee, the Council has during the year granted £100 to assist scientific persons or their relatives in distress. The Council desires to call the attention of the Fellows to the fact that, during the year, as during past years, the income of the fund has exceeded its expenditure, and that more aid could be given than has been given. With the view of increasing the usefulness of the fund, the Council has added to the list of those who can make representations to the Council concerning relief the Presidents of the Mathematical, Physical, and Entomological Societies.

I cannot but give expression to my deep regret, shared, I am sure, by every Fellow, that Lord Rayleigh, whose tenure of office as Secretary has been marked as much by faithful devotion to the interests of the Society as by scientific brilliancy, has thought it right, in consequence of increasing pressure of other engagements, to retire. But I rejoice that the Council can submit to your suffrages a man well qualified to wear the mantle laid down by Lord Rayleigh.

The Fellows will be pleased to learn that Mr. Rix, who was compelled by the condition of his health a year ago, to resign the position which he had held for many years with such great advantage to the Society, has much improved under the lighter labour of the Clerkship to the Government Grant Committee.

As his successor in the office of Assistant-Secretary, the Council, out of eighty-four candidates, unanimously selected Mr. Robert Harrison, who entered upon his duties on the 24th of April last.

The scientific work of the Society during the past year has been full of deep and varied interest. Early in the session the announcement of Röntgen's great discovery burst upon the world. Its wonderful applications to medicine and surgery attracted universal attention to it; and physicists everywhere have since been engaged

in investigating the nature of the new rays. Perhaps no outcome of such inquiries has been more remarkable than the fact observed by our Fellow Professor J. J. Thomson, that the rays have the power of discharging electricity, both positive and negative, from a body surrounded by a non-conductor; a mass of paraffin wax, for example, behaving in their path for the time being like a conductor of electricity.

It appears that Lenard had before observed the discharge of both kinds of electricity through air by the rays with which he worked. Lenard's rays, however, differ from Röntgen's in being deflectable by a magnet, implying, in the opinion of most British physicists, that they are emanations of highly electrified particles of ponderable matter, while Röntgen's are regarded as vibrations in the ether. The question naturally arises whether Lenard, in the observations referred to, may not have been working with a mixture of Röntgen's rays and his own. While points like these are still under discussion by experts, we cannot but feel that the letter X, the symbol of an unknown quantity, employed originally by Röntgen to designate his rays, is still not inappropriate.

I have before referred to Lippmann's beautiful demonstration and discussion of colour photography in one of our meetings.

Very important researches have been made both by Lord Rayleigh and by Professor Ramsay into the physical properties of the new substance, helium, discovered by Ramsay in the previous session. Among their most striking results is the fact ascertained by Rayleigh that the refractivity of helium is very much less than any previously known, being only 0.146; between three and four times less than that of hydrogen, the lowest that had before been observed, although helium has more than twice the density of hydrogen. And equally surprising is Ramsay's observation of the extraordinary distance through which electric sparks will strike through helium, viz., 250 or 300 mm. at atmospheric pressure, as compared with 23 mm. for oxygen and 39 for hydrogen. Such properties appear to indicate that in helium we have to do with an exceedingly remarkable substance.

The density of helium appears to be really slightly different according to the mineral source from which it is obtained; and this circumstance seems to give countenance to the opinion arrived at by Lockyer and also by Runge and Paschen, from spectroscopic investigation, that helium is not a perfectly pure gas. But whatever other gas or gases may be mixed with it, they must be as inert chemically as the main constituent; for all Ramsay's elaborate attempts to induce it, or any part of it, to combine with other bodies have entirely failed.

Professor Roberts-Austen, in the Bakerian lecture, brought before

us astonishing evidence that metals are capable of diffusing into each other, not only when one of them is in the state of fusion, but when both are solid. We learned that if clean surfaces of lead and gold are held together *in vacuo* at a temperature of only 40° for four days, they will unite firmly and can only be separated by a force equal to one-third of the breaking strain of lead itself. And gold placed at the bottom of a cylinder of lead 70 mm. long thus united with it, will have diffused to the top in notable quantities at the end of three days. Such facts tend to modify our views concerning the mutual relations of the liquid and solid states of matter.

Such are a few samples of the many highly interesting communications we have had in physics and chemistry. On the biological side also, there has been no lack of important work. Of this I may refer to one or two instances.

Professor Schäfer has given us an account of the well devised experiments by which he has conclusively established that the spleen is on the one hand capable, like the heart, of independent rhythmical contractions, and, on the other hand, has those contractions controlled by the central nervous system acting through an extraordinary number of efferent channels.

Professor Farmer and Mr. Lloyd-Williams made a very beautiful contribution to biology in the account they gave of their elaborate investigations on the fertilisation and segmentation of the spore in *Fucus*. Especial interest attached to this communication, from the fact that it described in a vegetable form exactly what had been established by Oscar Hertwig in *Echinodermata*, viz., that out of the multitude of fertilising elements that surround the female cell, one only enters it and becomes blended with its nucleus.

Lastly, I may mention the very remarkable investigation into the development of the Common Eel, which was described to us a fortnight ago by Professor Grassi, to which I shall have occasion to refer in some detail when speaking of his claims to one of the Society's medals.

These, as I have before said, are but samples of what we have had before us; but I think they are in themselves sufficient to justify the statement that, in point of scientific interest, the past year has been in no degree inferior to its predecessors.

#### COPLEY MEDAL.

*Professor Carl Gegenbaur, For. Mem. R.S.*

The Copley Medal for 1896 is given to Carl Gegenbaur, Professor of Anatomy in Heidelberg, in recognition of his pre-eminence in the science of Comparative Anatomy or Animal Morphology. Professor

Gegenbaur was born in 1826, and a few weeks ago his 70th birthday was celebrated by his pupils (who comprise almost all the leading comparative anatomists of Germany, Holland, and Scandinavia) by the presentation to him of a "Festschrift" in three volumes. Gegenbaur is everywhere recognised as the anatomist who has laid the foundations of modern comparative anatomy on the lines of the theory of descent, and has to a very large extent raised the building by his own work. His 'Grundzüge der vergleichenden Anatomie' was first published in 1859, when he was 33 years old. In the second edition, published in 1870, he remodelled the whole work, making the theory of descent the guiding principle of his treatment of the subject. Since then he has produced a somewhat condensed edition of the same work under the title of 'Grundriss' (translated into English and French), and now, in his 71st year, he is about to publish what will probably be the last edition of this masterly treatise, revising the whole mass of facts and speculations accumulated through his own unceasing industry and the researches of his numerous pupils during the past quarter of a century.

Gegenbaur may be considered as occupying a position in morphology parallel to that occupied by Ludwig in Physiology. Both were pupils of Johannes Müller, and have provided Europe with a body of teachers and investigators, carrying forward in a third generation the methods and aims of the great Berlin professor. Gegenbaur's first independent contribution to science was published in 1853. It was the outcome of a sojourn at Messina in 1852, in company with two other pupils of Johannes Müller, namely Albert Kölliker (still professor in Würzburg) and Heinrich Müller, who died not long afterwards. These young morphologists published the results of their researches in common. Gegenbaur wrote on Medusæ, on the development of Echinoderms, and on Pteropod larvæ. A long list of papers on the structure and development of Hydrozoa, Mollusca, and various invertebrata followed this first publication. The greatest interest, however, was excited among anatomists by his researches on the vertebrate skeleton (commenced already in 1849 with a research, in common with Friedreich, on the skull of axolotl). In a series of beautifully illustrated memoirs he dealt with and added immensely to our knowledge of the vertebral column, the skull, and the limb-girdles and limbs of Vertebrata, basing his theoretical views as to the gradual evolution of these structures in the ascending series of vertebrate forms upon the study of the cartilaginous skeleton of Elasmobranch fishes, and on the embryological characters of the cartilaginous skeleton and its gradual replacement by bone in higher forms. His method and point of view were essentially similar to those of Huxley, who independently and contemporaneously was engaged on the same line of work.

For many years Gegenbaur was professor in Jena, where he was the close friend and associate of Ernst Haeckel, but in 1875 he accepted the invitation to the Chair of Anatomy in Heidelberg, and in view of the increased importance of his duties as a teacher of medical students, and therefore of human anatomy, though still continuing his researches on vertebrate morphology, he produced a large treatise on that subject, which has run through two editions. In this work he made the first attempt to bring, as far as possible, the nomenclature and treatment of human anatomy into thorough agreement with that of comparative anatomy, and to a very large extent the changes introduced by him have influenced the teaching of human anatomy throughout Europe and America.

There is probably no comparative anatomist or embryologist in any responsible position at the present day who would not agree in assigning to Gegenbaur the very first place in his science as the greatest master and teacher who is still living amongst us. He is not only watching in his old age the developments of his own early teachings and the successful labours of his very numerous disciples, but is still exhibiting his own extraordinary industry in research, his keenness of intellectual vision, and his unrivalled knowledge and critical judgment.

#### ROYAL MEDAL.

*Sir Archibald Geikie, F.R.S.*

One of the Royal Medals is conferred on Sir Archibald Geikie, on the ground that of all British geologists he is the most distinguished, not only as regards the number and the importance of the geological papers which he has published as an original investigator, but as one whose educational works on geology have had a most material influence upon the advancement of scientific knowledge.

His original papers range over many of the main branches of geological science. His memoir upon the 'Glacial Drift of Scotland' (1863) is one of the classics in British geology. His work on the 'Scenery of Scotland, viewed in connection with the Physical Geology' (1865) was the first successful attempt made to explain the scenery of that country upon scientific principles, and is still without a rival. His papers on the "Old Red Sandstone of Western Europe" (1878-79) gave for the first time a clear and convincing picture of the great lake period of British geology, founded upon personal observation in the field.

His many original contributions to the Volcanic History of the British Isles form a succession of connected papers, crowded with important observations and discoveries, and brilliant and fertile generalizations respecting the abundant relics of former volcanic



activity in the British Isles from the earliest geological ages to Middle Tertiary times.

In the first series of these papers—commencing with the “Chronology of the Trap Rocks of Scotland” (1861), and ending with the “Tertiary Volcanic Rocks of the British Isles” (1869), abundant original proofs were advanced of the activity of volcanic action in the Western Isles of Scotland, and of its long duration in geological time. The second series (1871–88) was especially distinguished by the publication of his remarkable paper on the “Carboniferous Volcanic Rocks in the Basin of the Firth of Forth,” our earliest, and, as yet, our only monograph on a British volcanic area belonging to a pre-Tertiary geological system. The third series (begun in 1888) commenced with his memoir on the “History of Volcanic Action during the Tertiary Period in the British Isles,” a paper which is by far the most detailed and masterly contribution yet made to the subject, and for which the Brisbane Medal was awarded him by the Royal Society of Edinburgh; and this succession of papers has been followed by the publication of others of almost equal importance.

Sir Archibald Geikie has also written many papers and memoirs bearing upon geological processes and their effects, which have become permanent parts of our scientific literature.

While carrying out this highly important original work in Geology, Sir Archibald has most materially contributed to the advancement and diffusion of scientific knowledge by his many educational works upon Geology and Physical Geography. His ‘Elementary Lessons on Physical Geography’ has passed through several English and Foreign editions; his ‘Outlines of Field Geology’ is now in its fifth edition; and his article on Geology—originally contributed to the ‘Encyclopædia Britannica’ in 1879—was afterwards expanded by him into his well-known ‘Text-book of Geology,’ which has become the acknowledged British standard of Geology in general.

#### ROYAL MEDAL.

*Professor C. V. Boys.*

The other Royal Medal is awarded to Professor Boys, who has given to physical research a method of measuring minute forces far exceeding in exactness any hitherto used, by his invention of the mode of drawing quartz fibres, and by his discovery of their remarkable property of perfect elastic recovery.

Professor Boys has himself made several very important researches in which he has employed these fibres to measure small forces. Using a combination of a thermo-junction with a suspended coil in a galvanometer of the usual D’Arsonval type, a combination first devised by D’Arsonval himself, Professor Boys developed the idea in the micro-

radiometer, an instrument rivalling the bolometer in the measurement of small amounts of radiation. Its sensitiveness and accuracy were obtained in part by the use of a quartz fibre to suspend the coil, in part by the admirable design of every portion of the instrument. Professor Boys was the first to show its value in an investigation into the radiation received from the moon and stars:

In his great research on the value of the Newtonian constant of attraction, Professor Boys used quartz fibres to measure the gravitation forces between small bodies by the Michell-Cavendish torsion method. He redesigned the whole of the apparatus, and, calculating what should be the dimensions and arrangements to give the best results, he was led to the remarkable conclusion that accuracy was to be gained by a very great reduction in the size of the apparatus. This conclusion he justified by a determination of the value of the Newtonian constant, which is now accepted as the standard.

Professor Boys has also made some remarkable studies by a photographic method of the motion of projectiles, and of the air through which they pass.

All his work is characterised by the admirable adjustment of the different parts of the apparatus he uses to give the best results. His instruments, are, indeed, models of beauty of design.

#### RUMFORD MEDAL.

*Professor Philip P. Lenard and Professor W. C. Röntgen.*

In the case of the Rumford Medal, the Council have adopted a course, for which there are precedents in the awards of the Davy Medal, but which is, as far as the Rumford Medal itself is concerned, a new departure. They have decided to award the Medal in duplicate. It has often happened in the history of science that the same discovery has been made almost simultaneously and quite independently by two observers, but the joint recipients of the Rumford Medal do not stand in this relation to each other. Each of them may fairly claim that his work has special merits and characteristics of its own. To day, however, we have to deal, not with points of difference, but with points of similarity. There can be no question that a great addition has recently been made to our knowledge of the phenomena which occur outside a highly exhausted tube through which an electrical discharge is passing.

Many physicists have studied the luminous and other effects which take place within the tube; but the extension of the field of inquiry to the external space around it is novel and most important. There can be no doubt that this extension is chiefly due to two men—Professor Lenard and Professor Röntgen.

The discussion which took place at the recent meeting of the British Association at Liverpool proved that experts still differ as to the exact meaning and causes of the facts these gentlemen have discovered. No one, I believe, disputes the theoretical interest which attaches to the researches of both; or the practical benefits which the Röntgen rays may confer upon mankind as aids to medical and surgical diagnosis. But whatever the final verdict upon such points may be, the two investigators whom we honour to-day have been toilers in a common field, they have both reaped a rich harvest, and it is, therefore, fitting that the Royal Society should bestow upon both of them the Medal which testifies to its appreciation of their work.

DAVY MEDAL.

*Professor Henri Moissan.*

The Davy medal is given to Professor Henri Moissan.

Notwithstanding the abundant occurrence of fluorine in nature, the chemical history of this element and its compounds has until recently been scanty in the extreme, and, as far as the element in the free state is concerned, an entire blank. And yet from its peculiar position in the system of elements, the acquisition of a more extended knowledge of its chemical properties has always been a desideratum of the greatest scientific interest.

The frequent attempts which have been made from time to time to clear up its chemical history have been constantly baffled by the extraordinary difficulties with which the investigation of this element is beset.

Thanks to the arduous and continuous labours of M. Moissan, this void has been filled up. He has effected the isolation of fluorine in a state of purity, and prepared new and important compounds, the study of which has placed our knowledge of the chemical and physical properties of this element on a level with that of its immediate allies.

During the last few years M. Moissan has turned his attention to the study of chemical energy at extremely high temperatures, and by the aid of the electric furnace, which he has contrived, he has succeeded in obtaining a large number of substances whose very existence was hitherto undreamt of. It is impossible to set bounds to the new field of research which has thus been opened out. The electric furnace of M. Moissan has now become the most powerful synthetical and analytical engine in the laboratory of the chemist.

On studying the accounts which Moissan has given of his researches, we cannot fail to be struck with the originality, care, perseverance and fertility of resource with which they have been carried

on. The Davy Medal is awarded to him in recognition of his great merits and achievements as an investigator.

#### DARWIN MEDAL.

*Professor Giovanni Battista Grassi.*

The Darwin Medal for 1896 is awarded to Professor Grassi, of Rome (late of Catania), for his researches on the constitution of the colonies of the Termites, or White Ants, and for his discoveries in regard to the normal development of the Congers, *Murænæ*, and Common Eels from *Leptocephalus* larvæ.

From a detailed examination of the nature and origin of the colonies of the two species of Termites which occur in the neighbourhood of Catania, viz., *Termes lucifugus* and *Callotermes flavicollis*, he was able to determine certain important facts which have a fundamental value in the explanation of the origin of these and similar polymorphic colonies of insects, and are of first-rate significance in the consideration of the question of the share which heredity plays in the development of the remarkable instincts of "neuters," or arrested males and females, in these colonies. Professor Grassi has, in fact, shown that the food which is administered by the members of a colony to the young larvæ determines, at more than one stage of their development, their transformation into kings or queens, or soldiers or workers as the case may be, and the value of these researches is increased by the observations which he has made on the instincts of the different forms, showing that they do not in early life differ from one another in this respect, and are all equally endowed with the potentiality of the same instincts. These do not, however, all become developed and cultivated in all alike, but become specialised, as does the physical structure in the full-grown forms.

A very different piece of work, but having a no less important bearing on the theory of organic evolution, is that on the Leptocephali. These strange, colourless, transparent, thin-bodied creatures, with blood destitute of red corpuscles, had been regarded as a special family of fishes, but have been proved by Grassi's patient and long-continued labours to be larval forms of the various Murænoids. The most astonishing case is that of the Common Eel, *Anguilla vulgaris*, the development of which had been a mystery since the days of Aristotle. It had been long known that large eels pass from rivers into the sea at certain seasons, and that diminutive young eels, called in this country Elvers, ascend the rivers in enormous numbers. But, although the species is very widely distributed, no one in any country had been able to discover how the elvers were produced. Grassi has shown that, large as the eels are that pass into the sea, they are not perfectly developed fish, but only attain maturity in the depths of the

ocean. There they in due time breed, and from their eggs are hatched the young *Leptocephali*, which, after attaining a certain size, cease to feed, and assume the very different form of the elver. The possibility of establishing these remarkable facts depended on the powerful oceanic currents that prevail about the Straits of Messina, bringing up occasionally to the surface the inhabitants of the depths of the sea. Grassi was thus able to obtain from time to time both adult eels with fully developed sexual organs and their larval progeny, and he actually observed in an aquarium the development of a *Leptocephalus brevirostris* into an elver.

Such highly meritorious contributions to evolution are fitly recognised by the award of the Darwin Medal.

The Statutes relating to the election of Council and Officers were then read, and Professor Liversidge and Dr. Common having been, with the consent of the Society, nominated Scrutators, the votes of the Fellows present were taken, and the following were declared duly elected as Council and Officers for the ensuing year:—

*President*.—Sir Joseph Lister, Bart., F.R.C.S., D.C.L.

*Treasurer*.—Sir John Evans, K.C.B., D.C.L., LL.D.

*Secretaries*.— { Professor Michael Foster, M.A., M.D., D.C.L., LL.D.  
 { Professor Arthur William Rücker, M.A., D.Sc.

*Foreign Secretary*.—Edward Frankland, D.C.L., LL.D.

*Other Members of the Council.*

Prof. William Grylls Adams, M.A.; Professor Thomas Clifford Allbutt, M.D.; Professor Robert Bellamy Clifton, M.A.; William Turner Thiselton Dyer, C.M.G.; Prof. James Alfred Ewing, M.A.; Lazarus Fletcher, M.A.; Walter Holbrook Gaskell, M.D.; Prof. Alfred George Greenhill, M.A.; William Huggins, D.C.L.; Prof. Charles Lapworth, LL.D.; Major Percy Alexander MacMahon, R.A.; Prof. Raphael Meldola, F.C.S.; Prof. William Ramsay, Ph.D.; The Lord Walsingham, M.A.; Prof. Walter Frank Raphael Weldon, M.A.; Adml. William James Lloyd Wharton, C.B.

The thanks of the Society were given to the Scrutators.

*Statement of Receipts and Expenditure from November 12th, 1896.*

## 317

|   | £      | s.  | d.  |
|---|--------|-----|-----|
| To Balance at Bank, 13th November, 1895   | 904    | 6   | 10  |
| " " on Deposit (Mr. Ludwig Mond's Gift)   | 1,500  | 0   | 0   |
| " " " "   | 48     | 3   | 2   |
| Balance in hand, Catalogue Account  | 180    | 0   | 0   |
| " " " " " "   | 10     | 0   | 0   |
| Compositions  | 1,079  | 0   | 0   |
| Admission Fees  | 362    | 0   | 0   |
| Annual Contributions, 110 at £4 ... £440 0 0  | 59     | 13  | 0   |
| " " " " " " 213 at £3 ... £639 0 0  | 599    | 5   | 0   |
| Fee Reduction Fund, in lieu of Admission Fees and Annual Contributions                | 2,037  | 13  | 5   |
| Rents:  | 514    | 5   | 4   |
| Fee Farm, Lewes   | 780    | 10  | 5   |
| Mablethorpe Estate  | 7      | 10  | 7   |
| Ground Rents  | 7      | 14  | 9   |
| Dividends (exclusive of Trust Funds)  | 39     | 1   | 6   |
| Interest on Mortgage Loans (Duke of Norfolk)  | 191    | 11  | 11  |
| Sale of Transactions and Proceedings  | ...    | ... | ... |
| Interest on Bank Deposit Account  | 2      | 16  | 0   |
| Interest on Bank Deposit (Catalogue Account)  | 104    | 9   | 4   |
| Sale of Catalogue   | 500    | 0   | 0   |
| Transfer from Handley Fund on account of Catalogue                                    | ...    | ... | ... |
| Sale of Krakatoa Report (leaving £62 10s. 4d. Expenditure in excess of Receipts)      | ...    | ... | ... |
| Sale of Lendenfeld Monograph (leaving £650 4s. 1d. Expenditure in excess of Receipts) | ...    | ... | ... |
| Income Tax recovered, less Commission   | ...    | ... | ... |
| Treasury, Moiety of Publication Grant   | ...    | ... | ... |
|   | £8,928 | 1   | 3   |



# *Estates and Property of the Royal Society, including Trust Funds.*

Estate at Mablethorpe, Lincolnshire (55A. 2R. 2P.), rent £77 per annum.

Ground Rent of House, No. 57, Basinghall Street, rent £380 per annum.

" " of 23 houses in Wharton Road, West Kensington, rents £253 per annum.

Fee Farm Rent, near Lewes, Sussex, £19 4s. per annum.

One-fifth of the clear rent of an estate at Lambeth Hill, from the College of Physicians, about £52 per annum, Croonian Lecture Fund.

Stevenson Bequest. Chancery Dividend. One-fourth annual interest on balance of Bequest still in Court. (This year, £89 0s. 1d.)

£15,200 Mortgage Loan, 3½ per Cent., to the Duke of Norfolk.

|  | (being £11,196 10s. 8d. on account of the following Funds:—) |    |    |
|--|--|----|----|
|  | £  | s. | d. |
| £14,714 10s. 11d., 2½ per Cent. Consolidated Stock | 2,367  | 2  | 6  |
|  | 1,200  | 0  | 0  |
|  | 500  | 0  | 0  |
|  | 1,666  | 13 | 4  |
|  | 5,182  | 14 | 10 |
|  | 280  | 0  | 0  |

and £3,518 0s. 3d. in Chancery, arising from sale of the Coleman Street Estate.—General Purposes.

£1,251 8s. 10d. 2½ per Cent. Annuities { £800 0s. 0d. Scientific Relief Fund.  
£403 9s. 8d. Bakerian and Copley Medal Fund.  
£47 19s. 2d. Joule Memorial Fund.

£3,000 India 3½ per Cent. Stock.—General Purposes

£1,300 India 3 per Cent. Stock.—General Purposes (Earl of Derby's Bequest).

£800 Midland Railway 3 per Cent. Debenture Stock.—Keck Bequest.

£370 3s. 7d. Midland Railway 4 per Cent. Perpetual Guaranteed Preference Stock.—General Purposes (Stevenson Bequest).

£5,660 Madras Railway Guaranteed 5 per Cent. Stock { General Purposes, £5,000.  
Davy Medal Fund, £660.

£10,000 Italian Irrigation (Cavour Canal) Bonds.—The Gassiot Trust.

£9,061 6s. 8d. Great Northern Railway 3 per Cent. Debenture Stock { Scientific Relief Fund, £7,200.  
The Trevelyan Bequest, £1,861 6s. 8d.





*Trust Funds.* 1896.

*Scientific Relief Fund.*

£6,000 L. & N.W.R. 4 per Cent. Consolidated Guaranteed Stock.

£7 200 Great Northern Railway 3 per Cent. Debenture Stock.

£4,340 South Eastern Railway 5 per Cent. Debenture Stock.

£800 2½ per Cent. Annuities.

| Dr.                                   |            | Cr.  |            |
|---------------------------------------|------------|--|------------|
|                                       | £ s. d.    |  | £ s. d.    |
| To Balance, Income in hand .....      | 925 2 11 } | By Grants .....                                | 147 0 0    |
| Less Capital over Invested 36 16 10 } |            | „ Purchase of £800 2½ per Cent. Annuities..... | 849 1 0    |
| Dividends .....                       | 650 11 4   | „ Balance, Income in hand .....                | 1,450 2 6  |
| Income Tax recovered.....             | 21 8 3     | Less Capital over Invested 885 17 10 }         | 564 4 8    |
|                                       | £1,560 5 8 |  | £1,560 5 8 |

*Donation Fund.*

\$5,030 Great Northern Railway Perpetual 4 per Cent, Guaranteed Stock.

The Trevelyan Bequest. £1,861 6s. 8d. Great Northern Railway 3 per Cent. Debenture Stock.

|                                    | £    | <i>s.</i> | <i>d.</i> |                 | £    | <i>s.</i> | <i>d.</i> |
|------------------------------------|------|-----------|-----------|-----------------|------|-----------|-----------|
| To Balance .....                   | 482  | 8         | 2         | By Grants ..... | 631  | 2         | 11        |
| " Dividends .....                  | 248  | 9         | 8         | " Balance ..... | 262  | 3         | 1         |
| " Transfer from Jodrell Fund ..... | 142  | 5         | 7         |                 |      |           |           |
| " Income Tax recovered .....       | 8    | 2         | 7         |                 |      |           |           |
| " Grant refunded .....             | 12   | 0         | 0         |                 |      |           |           |
|                                    | £893 | 6         | 0         |                 | £893 | 6         | 0         |

*Ramford Fund.*

£2,367 2s. 6d. 2½ per Cent. Consolidated Stock.

|                              | £    | s. | d. |                  | £    | s. | d. |
|------------------------------|------|----|----|------------------|------|----|----|
| To Balance .....             | 49   | 1  | 8  | By Balance ..... | 114  | 1  | 4  |
| " Dividends .....            | 62   | 18 | 4  |                  |      |    |    |
| " Income Tax recovered ..... | 2    | 1  | 4  |                  |      |    |    |
|                              |      |    |    |                  |      |    |    |
|                              | £114 | 1  | 4  |                  | £114 | 1  | 4  |

*Bakerian and Copley Medal Fund.*

Sir Joseph Copley's Gift. £1,666 13s. 4d. 2½ per Cent. Consolidated Stock.

£403 9s. 8d 2½ per Cent. Annuities.

|   | £    | s. | d. |  | £    | s. | d. |
|---|------|----|----|--|------|----|----|
| To Balance .....                          | 108  | 13 | 3  | By Gold Medal .....                            | 4    | 12 | 1  |
| " Dividends, New 2½ per Cent. Stock ..... | 9    | 15 | 0  | " Bakerian Lecture, Prof. Roberts-Austen ..... | 4    | 0  | 0  |
| " Dividend—Sir J. Copley's Fund .....     | 44   | 6  | 4  | " Gift :—Prof. C. Weierstrass .....            | 50   | 0  | 0  |
| " Income Tax recovered .....              | 1    | 15 | 2  | " Balance .....                                | 105  | 17 | 8  |
|   |      |    |    |  |      |    |    |
|   | £164 | 9  | 9  |  | £164 | 9  | 9  |

*The Keck Bequest.*

£800 Midland Railway 3 per Cent. Debenture Stock.

|                              | £   | s. | d. |                                      | £   | s. | d. |
|------------------------------|-----|----|----|--------------------------------------|-----|----|----|
| To Dividends .....           | 23  | 4  | 0  | By Balance .....                     | 23  | 18 | 5  |
| " Income Tax recovered ..... | 15  | 2  |    | " Payment to Foreign Secretary ..... |     |    |    |
|                              |     |    |    |                                      |     |    |    |
|                              | £23 | 19 | 2  |                                      | £23 | 19 | 2  |

*Wintringham Fund.*

£1,200 2½ per Cent. Consolidated Stock.

|                             | £   | s. | d. |  | £   | s. | d. |
|-----------------------------|-----|----|----|--|-----|----|----|
| To Balance .....            | 34  | 8  | 8  | By Payment to Foundling Hospital ..... | 34  | 8  | 8  |
| " Dividends .....           | 31  | 18 | 0  | " Balance .....                        | 32  | 18 | 11 |
| " Income Tax recovered..... | 1   | 0  | 11 |  |     |    |    |
|                             | £67 | 7  | 7  |  | £67 | 7  | 7  |

*Croonian Lecture Fund.*

One-fifth of the clear rent of an Estate at Lambeth Hill, from the College of Physicians, about £52 per annum.

|                             | £   | s. | d. |                                     | £   | s. | d. |
|-----------------------------|-----|----|----|-------------------------------------|-----|----|----|
| To Balance .....            | 2   | 6  | 0  | By Lecture (1896), Dr. Waller ..... | 50  | 0  | 0  |
| " Rent .....                | 50  | 5  | 4  | " Balance .....                     | 4   | 4  | 3  |
| " Income Tax recovered..... | 1   | 12 | 11 |                                     |     |    |    |
|                             | £54 | 4  | 3  |                                     | £54 | 4  | 3  |

*Davy Medal Fund.*

£660 Madras Railway Guaranteed 5 per Cent. Stock.

|                             | £   | s. | d. |                     | £   | s. | d. |
|-----------------------------|-----|----|----|---------------------|-----|----|----|
| To Balance .....            | 50  | 8  | 10 | By Gold Medal ..... | 32  | 4  | 6  |
| " Dividends .....           | 32  | 1  | 0  | " Balance .....     | 51  | 6  | 3  |
| " Income Tax recovered..... | 1   | 0  | 11 |                     |     |    |    |
|                             | £83 | 10 | 9  |                     | £83 | 10 | 9  |

*The Gassiot Trust.*

£10,000 Italian Irrigation Bonds.  
£500 2½ per Cent. Consolidated Stock.

|                              | £    | s. | d. |                                    | £    | s. | d. |
|------------------------------|------|----|----|------------------------------------|------|----|----|
| To Balance .....             | 80   | 18 | 6  | By Payments to Kew Committee ..... | 444  | 11 | 4  |
| „ Dividends .....            | 457  | 17 | 0  | „ Law Charges .....                | 6    | 5  | 2  |
| „ Income Tax recovered ..... | 14   | 19 | 3  | „ Balance .....                    | 102  | 18 | 3  |
|                              |      |    |    |                                    |      |    |    |
|                              | £553 | 14 | 9  |                                    | £553 | 14 | 9  |

*Handley Fund.*

£4,798 Lancashire and Yorkshire Railway 4 per Cent. Guaranteed Stock.

|                              | £    | s. | d. |  | £    | s. | d. |
|------------------------------|------|----|----|--|------|----|----|
| To Dividends .....           | 185  | 10 | 4  | By Transfer to Catalogue Account ..... | 191  | 11 | 11 |
| „ Income Tax recovered ..... | 6    | 1  | 7  |  |      |    |    |
|                              | £191 | 11 | 11 |  | £191 | 11 | 11 |

*The Jodrell Fund.*

£5,182 14s. 10d. 2¼ per Cent. Consolidated Stock.

|                              | £    | s. | d. |                                    | £    | s. | d. |
|------------------------------|------|----|----|------------------------------------|------|----|----|
| To Dividends .....           | 137  | 15 | 8  | By Transfer to Donation Fund ..... | 142  | 5  | 7  |
| „ Income Tax recovered ..... | 4    | 9  | 11 |                                    |      |    |    |
|                              | £142 | 5  | 7  |                                    | £142 | 5  | 7  |

*Fee Reduction Fund.*

|  |      |       |
|--|------|-------|
| £5,000 Metropolitan 3½ per Cent. Stock.  |      |       |
| £9,333 London and North Western Railway 3 per Cent. Perpetual Debenture Stock. |      |       |
| To Balance .....   | £    | s. d. |
| Dividends .....  | 123  | 3 2   |
| Income Tax recovered .....   | 439  | 6 3   |
|  | 14   | 5 11  |
|  | £576 | 15 4  |
| By Transfer to Royal Society General Account.....                              |      |       |
| Purchase of £100 Metropolitan 3½ per Cent. Stock                               | 122  | 3 6   |
| Balance .....  | 92   | 11 10 |
|  | £576 | 15 4  |

*Darwin Medal Fund.*

|   |      |       |
|---|------|-------|
| £2,500 South Eastern Railway 4 per Cent. Debenture Stock.                   |      |       |
| To Balance .....  | £    | s. d. |
| Dividends .....   | 170  | 5 2   |
| Income Tax recovered .....  | 96   | 13 4  |
|   | 2    | 18 3  |
|   | £269 | 16 9  |
| By Purchase of £100 South Eastern Railway 4 per Cent. Debenture Stock ..... |      |       |
| Balance .....   | 152  | 6 6   |
|   | 117  | 10 3  |
|   | £269 | 16 9  |

*Joule Memorial Fund.*

|   |      |       |
|---|------|-------|
| £1,000 London, Brighton, and South Coast Railway Consolidated Guaranteed 5 per Cent. Stock. |      |       |
| £47 19s. 2d. 2½ per cent. Annuities.  |      |       |
| To Balance .....  | £    | s. d. |
| Dividends, &c. ....   | 82   | 1 6   |
| Income Tax recovered .....  | 49   | 6 6   |
| Deposit Account withdrawn .....   | 1    | 11 9  |
|   | 50   | 0 0   |
|   | £182 | 19 9  |
| By Studentship, J. D. Chorlton .....  |      |       |
| Purchase of £47 19s. 2d. 2½ per cent. Annuities...  | 50   | 0 0   |
| Balance .....   | 82   | 19 9  |
|   | £182 | 19 9  |

*Brady Library Fund.*

£280 2½ per Cent. Consolidated Stock.

|                             | £         | s. | d. |                 | £         | s. | d. |
|-----------------------------|-----------|----|----|-----------------|-----------|----|----|
| To Balance.....             | 26        | 2  | 3  | By Balance..... | 33        | 14 | 10 |
| „ Dividends ..              | 7         | 9  | 0  |                 |           |    |    |
| „ Income Tax recovered..... |           | 3  | 7  |                 |           |    |    |
|                             | <hr/>     |    |    |                 | <hr/>     |    |    |
|                             | £33 14 10 |    |    |                 | £33 14 10 |    |    |
|                             | <hr/>     |    |    |                 | <hr/>     |    |    |

*Gunning Fund.*

£1,000 4 per Cent. Bond of His Excellency Dr. Gunning.

|                 | £       | s. | d. |                 | £       | s. | d. |
|-----------------|---------|----|----|-----------------|---------|----|----|
| To Balance..... | 40      | 0  | 0  | By Balance..... | 80      | 0  | 0  |
| „ Interest..... | 40      | 0  | 0  |                 |         |    |    |
|                 | <hr/>   |    |    |                 | <hr/>   |    |    |
|                 | £80 0 0 |    |    |                 | £80 0 0 |    |    |
|                 | <hr/>   |    |    |                 | <hr/>   |    |    |

*Buchanan Medal Fund.*

£258 9s. 2d. Metropolitan 3 per Cent. Stock.

|                 | £        | s. | d. |                 | £        | s. | d. |
|-----------------|----------|----|----|-----------------|----------|----|----|
| To Balance..... | 9        | 7  | 6  | By Balance..... | 16       | 17 | 6  |
| „ Dividends ..  | 7        | 10 | 0  |                 |          |    |    |
|                 | <hr/>    |    |    |                 | <hr/>    |    |    |
|                 | £16 17 6 |    |    |                 | £16 17 6 |    |    |
|                 | <hr/>    |    |    |                 | <hr/>    |    |    |

*Income and Expenditure Account from 13th November, 1895, to 12th November, 1896.*

| RECEIPTS.   |       |            | EXPENDITURE.   |       |                   |
|---|-------|------------|--|-------|-------------------|
| £   | s.    | d.         | £  | s.    | d.                |
| To Balance at Bank and in hand 13th November, 1895 :— |       |            |  |       |                   |
| General Purposes .....                                | 593   | 10 0       | By Salaries, and Wages .....                                 |       | 1,575 0 0         |
| Catalogue Account .....                               | 100   | 0 0        | " Publications .....   |       | 1,957 7 1         |
| Water Research Account .....                          | 259   | 0 0        | " Catalogue of Scientific Papers .....                       | 709   | 10 3              |
| On Deposit Account, Mr. Ludwig Mond's Gift .....      | 1,500 | 0 0        | Index to ditto .....   | 203   | 11 6              |
|   |       |            |  |       |                   |
| Composition and Admission Fees .....                  |       | 2,452 10 0 | Books for the Library .....                                  |       | 913 1 9           |
| " Annual Contributions .....                          |       | 190 0 0    | " Miscellaneous Expenses, Office, House, Reception, &c. .... |       | 213 5 9           |
| " Rents .....   |       | 1,441 0 0  | Water Research Payments .....                                |       | 1,456 14 2        |
| " Dividends and Interest .....                        |       | 658 18 0   | " Publication Grant Payments .....                           |       | 229 8 2           |
| " Sale of Publications .....                          |       | 2,559 9 4  | " International Catalogue Conference .....                   |       | 445 10 0          |
| " Receipts on Account of Catalogue .....              |       | 783 6 5    | " Loan to Coral Reef Boring Committee .....                  |       | 197 5 4           |
| " Income Tax recovered .....                          |       | 238 8 2    | " Balance at Bank and in hand :—                             |       | 300 0 0           |
| " Treasury, Moiety of Publication Grant .....         |       | 104 9 4    | General Purposes .....                                       | 251   | 9 11              |
|   |       |            | Publication Grant .....                                      | 54    | 10 0              |
|   |       |            | Water Research Account .....                                 | 29    | 11 10             |
|   |       |            | On Deposit Account, Mr. Ludwig Mond's Gift .....             | 1,504 | 17 3              |
|   |       |            |  |       | 1,640 9 0         |
|   |       |            |  |       | <u>£8,928 1 3</u> |



Professors Albert Heim, Gabriel Lippmann, G. Mittag-Leffler, and G. Schiaparelli were, at the meeting on the 26th of November, balloted for and elected Foreign Members of the Society.

The following Table shows the progress and present state of the Society with respect to the number of Fellows :—

|                   | Patron<br>and<br>Royal. | Foreign. | Com-<br>pounders. | £4<br>yearly. | £3<br>yearly. | Total. |
|-------------------|-------------------------|----------|-------------------|---------------|---------------|--------|
| Nov. 30, 1895 ..  | 4                       | 41       | 141               | 112           | 200           | 498    |
| Since Elected ..  |                         | + 9      | + 2               | + 1           | + 13          | + 25   |
| Since Compounded  |                         |          | + 1               |               | — 1           |        |
| Since Deceased .. |                         | — 5      | — 6               | — 10          | — 3           | — 24   |
| Withdrawn ..      |                         |          |                   | — 1           |               | — 1    |
| Nov. 30, 1896 ..  | 4                       | 45       | 138               | 102           | 209           | 498    |

Account of Grants from the Donation Fund in 1895–96.

|   | £           | s.       | d.        |
|---|-------------|----------|-----------|
| Dr. Gamgee, in aid of his Researches on the Behaviour of Hæmoglobin, &c., toward Ultra-violet Rays.....   | 50          | 0        | 0         |
| Coral Reef Committee, towards the Purchase of Diamonds for Boring a Coral Atoll in the Pacific Ocean ....   | 150         | 0        | 0         |
| Dr. M. Foster, for Dr. W. Poole, Medical Officer of the British Central African Protectorate, for the Purchase of a Microscope to aid him in his Researches ..... | 21          | 2        | 11        |
| Sir A. Geikie, in aid of Mr. Reid's Geological Borings at Hoxne.....  | 30          | 0        | 0         |
| Sir A. Geikie, to assist him in Excavations at Hitchin  | 50          | 0        | 0         |
| Profs. Fleming and Dewar, in aid of their Researches on the Diamagnetic qualities of Metals at Low Temperatures   | 50          | 0        | 0         |
| Prof. Burdon Sanderson, in aid of his Investigations in relation to Tuberculin .....  | 60          | 0        | 0         |
| Dr. Vaughan Harley, in further aid of his Researches on Absorption from the Alimentary Canal .....  | 25          | 0        | 0         |
| Dr. J. G. Stoney, for Calculations of the Positions of the November Meteors .....   | 15          | 0        | 0         |
| Professor Sherrington, to aid him in his Researches on the Nervous System .....   | 50          | 0        | 0         |
| Marine Biological Association, towards the Purchase of a Steam Yacht for trawling .....   | 100         | 0        | 0         |
|   | <u>£601</u> | <u>2</u> | <u>11</u> |