SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, November 10.—Sir Archibald Geikie, K.C.B., president, in the chair.—Sir George **Darwin**: (1) The tidal observations of the British Antarctic Expedition, 1907; (2) a mistake in the instructions for a certain apparatus in tidal reductions.—F. **Soddy** and A. J. **Berry**: Conduction of heat through rarefied gases.—II. The thermal conductivities of argon, helium, and hydrogen at very low pressure have been examined in greater detail with new and improved apparatus. The hypothesis provisionally put forward (Roy. Soc. Proc., A, vol. lxxxiii., 1910, p. 254), that the interchange of energy on impact is imperfect in the lighter gases, has been tested and found not to account for the smallness of the ratio (K/Q) of the found to the calculated conductivities. The conductivity of hydrogen using a palladium hot wire is the same as that with a platinum wire. Change of temperature of the hot surface, that of the cold surface remaining constant at room temperature, does not exert so much influence on the value of K as was anticipated. The value of K/Q tended to diminish as the difference of temperature increased, especially at high temperatures. At low temperatures, attained by immersing the apparatus in liquid air and in solid carbon dioxide and ether, the ratio K/Q is *diminished*, whereas on the hypothesis of imperfect interchange of energy an increase was expected. Jacketing the apparatus with vapours up to 264° caused an increase in the value of K/Q. It appears that, most probably, increase in the difference of temperature between the surfaces tends to decrease the value of K/Q, whereas increase in the temperature of both surfaces increases it. Argon under some of the new conditions tried conforms to the theory hardly better than the other gases, and the agreement found previously was probably fortuitous. The general conclusion is that the conductivity at low pressures varies less with the nature of the gas and with the temperature of the experiment than is to be expected from kinetic considerations. The extreme values found for the conductivities of the three gases over a range of about 450° lay between 0·8 and 3·4, whereas the calculated values lie between 0·95 and 16·2 ($\times 10^{-5}$ calorie, per sq. cm. of hot surface, per 1° difference of temperature, per 0·01 mm. pressure of gas).—W. H. **Hatfield**: The chemical physics involved in the precipitation of free carbon from the alloys of the iron-carbon system. The intention of the author is to examine the conditions under which free carbon is produced in iron and steel. Whereas it has been an open question as to whether or not free carbon could be produced direct from the solid solution, the paper is intended to prove the truth of the theory that free carbon can only be produced by the dissociation of the free carbide. It is hoped to demonstrate that this theory holds good through the whole range of the alloys in which free carbon, whether as graphite or annealing carbon, is found. After the presentation of evidence in support of this view of the production of graphite in and near the freezing range, experiments, performed to determine the chemical physics underlying the liberation of annealing carbon in white cast iron, are described. By the electrolytic method of analysis the cementite carbide was obtained from such irons of varying composition, and it is shown how, by varying the percentage of silicon, manganese, or sulphur in the iron, the composition of the cementite is modied and its degree of stability at varying temperatures determined. It is also shown that the size and structure of the precipitated annealing carbon is largely due to the size and structure of the original cementite. Experiments performed to produce annealing carbon in blister steel during the cementation process are then described, after which an explanation of the phenomena of "black" steel is discussed; it is shown that the free carbon found in such steels may present one of two formations, each produced under different conditions. The author further endeavours to demonstrate that whilst the free cementite carbide is dissociated at high temperatures through the whole range of the alloys, the carbide remaining in solid solution does not dissociate until the resolution of the solid solution into the carbide and iron of the pearlite, at the carbon change point.—Dr. F. **Horton**: A spectroscopic investigation of the nature of the carriers of positive electricity from heated aluminium phosphate. The emission of positive ions from substances heated in a vacuum has been investigated by several experimenters, and it has been found that the ratio of the charge to the mass of the ions is the same for all the substances so far experimented on. Assuming that the charge is equal to that carried by the hydrogen ion in electrolysis, the mass of the carriers of positive electricity from heated substances must be about twenty-six times that of the hydrogen atom. The object of this research was to obtain the spectrum of these ions. Aluminium phosphate was chosen for investigation, because of the very large positive ionisation produced on heating this substance. A calculation showed that, with the apparatus used, it might be expected to collect a sufficient quantity of the carriers to obtain their spectrum in a small vacuum tube. The vessel used to collect the carriers was cooled in liquid air during the passage of the thermionic current from a strip of platinum covered with aluminium phosphate to a surrounding platinum cylinder. The material collected was then allowed to vaporise, and its spectrum was obtained by rendering it luminous with an electrodeless ring discharge. The spectrum of carbon monoxide was always obtained, although precautions had been taken to exclude this gas, or materials which might give rise to it, from the apparatus. It is concluded, therefore, that the positive ions consist of carbon monoxide, the molecular weight of which agrees fairly well with that required by the results of the e/m determinations. It is considered improbable that this gas is evolved on heating every substance which has been experimented on in the determinations of the specific charge, but from the nature of the apparatus used it must always have been present during these determinations. In the paper reasons are given for believing that molecules of carbon monoxide readily act as carriers of positive electricity, and this gas probably diffuses into the hot metal or other substance and is evolved in an ionised state.—N. **Bohr**: The determination of the tension of a recently formed water-surface. Arguments in further support of the author's previous conclusion, that the surface tension does not change sensibly with the time that has elapsed since the surface was formed.—Lord **Rayleigh**: Aërial plane waves of finite amplitude.—J. J. **Manley**: Observations on the anomalous behaviour of delicate balances, and an account of devices for increasing accuracy in weighings.—Prof. F. W. **Dyson**: The improbability of a random distribution of the stars in space.—G. I. **Taylor**: The conditions necessary for discontinuous motion in gases.—The Hon. R. J. **Strutt**: (1) The radium content of basalt; (2) measurements of the rate at which helium is produced in thorianite and pitchblende, with a minimum estimate of their antiquity.

Royal Microscopical Society, October 19.—Mr. E. J. Spitta, vice-president, in the chair.—J. J. **Simpson**: Hicksonella, a new gorgonellid genus. The genus is established to include three species, all collected off South Africa. One species was described by Prof. Hickson in 1904 under the name of *Juncella spiralis*, but the author believes that a reference to the genus Juncella is impossible. The clearing up of the position of this puzzling specimen was facilitated by recent work of the author in his revision of the family of the Juncellids. In addition to *Hicksonella spiralis*, g.n., he describes *H. flagellata*, sp.n., and *H. capensis*, sp.n.—E. **Heron-Allen** and A. **Earland**: Some varietal forms of *Massilina secans*. After referring to several varietal forms that had been previously described, the authors related the finding of numerous specimens of three of these varieties in narrow observation tanks where some gatherings of Foraminifera, made off Selsey Bill, had been placed, and where they multiplied. The conclusion arrived at was that these variations were caused by the want of sufficient shell-making material, the carbonate of lime in the tanks having been used up, the sea water never having been renewed.—E. M. **Nelson**: A micrometric difficulty. The author referred to the difficulty of counting correctly the number of ruled lines, or diatomic striæ, in a given space. The trouble does not arise when the interspaces are relatively wide compared with the breadth of the lines, but it does so when the breadth of the interspaces approaches that of the lines. It is the black and white dot image that is

responsible for the trouble. When the focus is at a white-dot image the white lines must be counted, and *vice versâ* when the focus gives a black-dot image.—E. M. **Nelson**: The resolution of new detail in a *Coscinodiscus asteromphalus*. This paper has reference to the resolution of further detail obtained by a new one-eighth objective by Zeiss, described in a previous communication. The new detail discovered is a fine sieve covering the so-called eye-spot in *C. asteromphalus*. As the size of the eye-spot is only 1 14,000th of an inch, it may be left to the imagination to estimate the size of the minute perforations forming the sieve.

Physical Society, October 28.—Prof. H. L. Callendar, F.R.S., president, in the chair.—Prof. Ernest **Wilson** and W. H. **Wilson**: A new method for producing high tension discharges. According to this method energy is taken from an alternating or continuous current source and stored in a magnetic field by an inductance; it is then permitted to surge into a condenser which forms with the inductance a *low* frequency oscillating circuit. When the energy is stored in the condenser the latter is mechanically bridged across the primary winding of a spark-coil, with which it forms a *high* frequency oscillatory circuit. The energy is then transmitted by the secondary winding of the spark-coil to the work circuit in the well-known manner. Briefly the following are some of the advantages gained:—(1) For X-ray work the inverse electromotive force at "make" is eliminated, thereby leading to increased life of the tube and to a more sharply defined radiograph. (2) Only a small magnetising current is required as the inductance has a nearly closed magnetic circuit. This gives rise to a very small C^2R loss and consequently higher efficiency. (3) On account of the long periodic time of the system between the periods of "break" and "short-circuit," the voltage across the contact of the interrupter at "break" does not rise to a high value, or rises so slowly that the contacts are well separated before it is developed. Hence immunity from sparking. (4) The method lends itself to few secondary turns and this keeps down the time constant. It also makes the coil lighter, cheaper, and more compact. (5) The method lends itself to low secondary resistance—a point of great importance in connection with radio-telegraphy. (6) The iron of the spark-coil can be kept small in amount, and special attention can be paid to its lamination and insulation, as it may have to be operated at frequencies of three or four thousand per second. (7) The elimination of sparking increases efficiency, and on board ship where coal gas is not conveniently obtainable this is an advantage. (8) The apparatus can be worked from direct-current or alternating-current systems at usual voltages, or from a portable battery of a few storage-cells. (9) The oscillatory current at "break" does not pass through the battery, and hence does not assist in its discharge. (10) The iron in the magnetic circuit of the external inductance has only to operate at low frequency, and hence it has not to be finely laminated. (11) When used on alternating-current systems, rectification, if desired, is easily effected by employing two short-circuiting brushes, one for each half-period, and allowing the second brush to short-circuit at the moment when the condenser is fully charged after allowing a second complete surge of the energy between the condenser and the inductance of the spark-coil. (12) The apparatus is light, efficient, and cheap, and is suitable for radio-telegraphy, X-ray, medical, and other work in which high-tension electricity is employed.—F. **Rogers**: The behaviour of steel under combined static stress and shock. Attention is directed to the importance of the time rate of increase of stress, ds/dt, in the behaviour of materials under stress. The exact determination of this rate must usually present much difficulty, but the indirect experimental method adopted consisted in submitting specimens of steel to shock whilst under static loading. The conclusion that steel is substantially less resistant to shock whilst it is under static stress appears to be definitely established. In some cases the effect of a large static stress was to diminish the resistance to shock by as much as 30 per cent. The correction for the work done upon the sample in applying the static load is relatively small. Thus the energy absorbed in breaking a sample of steel is greater when entirely applied as shock than when applied partly as shock and partly statically. This difference is considered to be due chiefly to the difference in the rate of increase of stress at the higher stresses in the two cases. The actual values of the highest stresses are not necessarily identical, but probably the higher the rate of increase of stress the higher is the greatest stress reached before rupture occurs, whilst, simultaneously, deformation is diminished, and the intimate nature of the breakdown suffers a corresponding variation. At the higher static loads employed some portions of the test-pieces were stressed beyond their elastic limits, and this may also help to account for a part of the diminution in resistance to shock.

Linnean Society, November 3.—Dr. D. H. Scott, F.R.S., president, in the chair.—Prof. W. A. **Herdman**: A comparison of the summer plankton on the west coast of Scotland with that in the Irish Sea. This paper is the result of a series of vertical plankton hauls taken with the "Nansen" closing tow-net (made of No. 20 silk) from the S.Y. *Ladybird* in July of the last four years, from various deep hauls (eighteen of them being from more than 100 fathoms) at various localities off the west coast of Scotland. A comparison of the collection shows (1) that there is a constancy year after year in the nature of the plankton at certain localities; and (2) that some of the localities, not very far apart, differ considerably from one another in the nature of their plankton at the same time of year (July). Some of these deep hauls consist markedly of zoo-plankton and others of phyto-plankton, and the latter show a close resemblance to the phyto-plankton hauls typical of the vernal maximum of diatoms in the Irish Sea. The complete disappearance of the phyto-plankton, which is such a marked feature in the summer (July and August) gatherings from the Irish Sea, does not seem to take place in some localities off the west coast of Scotland, and these phyto-plankton hauls are obtained, not in the deep fiord-like lochs, but in the open sea, *e.g.* off Ardnamurchan and off the islands of Rum and Canna in the Sea of the Hebrides.—J. C. F. **Fryer**: The structure and formation of Aldabra and neighbouring islands, with notes on their flora and fauna. Aldabra, situate 250 miles north-west of Cape Amber, is a large atoll with an almost complete land-rim, a large shallow lagoon, and a narrow fringing reef. The land-rim is composed of coral-limestone, which gives definite evidence that Aldabra was formed by elevation and once stood at more than 40 feet above sea-level, though rain-water denudation has reduced this to its present level of 15 feet A deposit of guano, by combination with the limestone, has produced phosphatic rocks, interesting in that they prove that the lagoon was once non-existant, and has since been formed by erosion and denudation. The atoll is still being washed away, but the loss is in part compensated by the piling up of sand by wind and wave. The fauna and flora, though peculiar, have been largely derived from Madagascar, the flora being interesting in showing four distinct types of jungle. Assumption, Cosmoledo, Astove, are also islands and atolls of elevated coral-rock, and form an interesting series showing the loss of rock-land by erosion and its replacement by sand and clays. Giant land-tortoises still exist on Aldabra, and fossil remains were found on the three other islands visited; in this connection it is noteworthy that none of these islands has ever been connected with continental land.—H. B. **Bigelow**: The Siphonophora of the *Research* Biscayan plankton. The memoir forms the thirteenth report on Biscayan plankton collected on board H.M.S. *Research* in 1900. The collection consisted exclusively of Calycophoridæ, with the exception of a single fragment from another group. In his report of the Siphonophora of the *National*, Prof. Chun noted a similar absence of Physophoridæ during the North Atlantic summer, and suggested that these latter forms must be at considerable depths at that season, yet the numerous hauls of the *Research* with closing nets down to really great depths failed altogether to find them. On the other hand, it is only during summer that these Physophoridæ are found on the eastern coasts of North America, at a time when the cold current alongshore is at its warmest; and further, they were not uncommon in July and August during cruises of the *Research* in the Færöe Channel, in the cooler water of

more northern origin. All these facts seem to point to rather narrow limits, outside of which the Physophoridæ perhaps die down to a large extent seasonally, except for a few specimens which will reproduce when the temperature optimum is again reached. The second point of interest to which the author directs attention is that all the ten species captured—except one new genus and species—were also taken in the eastern Pacific expedition of the *Albatross* under the late Prof. Alexander Agassiz. The collection included one new species of Diphyes and one new genus, Nectopyramis, apparently a monophyid. On the question of vertical distribution, which was a main object of the cruise, the author has arrived at some conclusions of interest. The Calycophoridæ were comparatively rare at the surface, but most plentiful somewhere below 25 and above 100 fathoms. The only species taken sufficiently often to allow of discussion was *Diphyes appendiculata*. The diphyid or polygastric generation was uncommon at the surface, seemed to reach its plurimum about 75–100 fathoms, and below that was very seldom met with. The eudoxid or sexual generation, on the other hand, presented a plurimum at the surface, was taken less often down to 100 fathoms, and only once below that depth, namely, between 400 and 500 fathoms. Another form captured, *Chuniphyes multidentata*, has so far been recorded only from considerable depths; the captures by the *Research* fix it as low as between 2000–1000 fathoms, that is, between nearly 3½ miles and 2 miles deep. The highest capture was in an open net hauled for an hour at 250 fathoms, and thence to the surface; but as it was taken in none of the ninety-five hauls above 250 fathoms, this is probably about its upper limit.

Mathematical Society, November 11.—Sir W. D. Niven, president, and subsequently Dr. H. F. Baker, newly elected president, in the chair.—Sir W. D. **Niven**: The relations of mathematics to experimental science (presidential address).—G. T. **Bennett**: The double-six of lines. Dr. W. H. **Young** and Mrs. **Young**: The existence of a differential coefficient.—Dr. W. H. **Young**: (1) Note on the property of being a differential coefficient; (2) conditions that a trigonometrical series may have the Fourier form.—F. **Tavani**: A class of integral functions which includes Riemann's Zeta-function.—T. W. **Chaundy**: The geometrical representation of non-real points in space of two and three dimensions.—J. E. **Littlewood**: The extension of Tauber's theorem.—F. B. **Pidduck**: The stability of rotating shafts.—J. E. **Campbell**: A class of orthogonal surfaces.—S. **Chapman**: Non-integral orders of summability of series and integrals.—Dr. A. R. **Forsyth**: Lineo-linear transformations, especially in two variables.—Dr. W. F. **Sheppard**: Notes on terminating hypergeometric series.—H. **Bateman**: The transformation of a particular type of electromagnetic field and its physical interpretation.—Dr. P. **Mahlo**: Uber die Dimensionentypen des Herrn Frechet im Gebiete der linearen Mengen.

MANCHESTER.

Literary and Philosophical Society, October 18.—Mr. F. Jones, president, in the chair.—Prof. G. Elliot **Smith**: The convolutions of the brain. The cortex is mapped out into a great number of territories, differing in structure and function, and varying in size in different mammals, not only because the sense-organs themselves vary in size and acuteness in different creatures, but also because in different orders and families a sense organ of a given size will have a varying cortical representation. Thus, if one were to take a dog and a baboon with eyes of the same size, the monkey will be found to possess a much larger cortical visual area than the dog. It is these differences which determine the varied plans of cortical folding and the resulting varieties in the patterns of the convolutions in different mammals. Folding occurs most often along the boundary line between two areas of different structure and function. The difference in the rate of expansion of two such areas is no doubt the reason for this type of fissure formation—limiting sulci. In the second place a rapidly growing cortical territory, meeting with obstruction to its expansion on all sides, may become buckled in, and so a furrow develops along its axis (*i.e.*, within its area), instead of at its edges. This second class of furrow is much less frequent than the first class, and may be distinguished as the group of axial sulci. There is a third variety, which may be called the operculated sulcus, in which one lip projects over a submerged area. Sulci of this type are produced by the submerging of a specialised fringing territory surrounding a main sensory area. In the fourth place various mechanical factors come into operation to modify the form of furrows formed in one of these three ways, or even to produce new sulci. By the application of these principles it is possible to interpret the meaning and the mode of formation of most of the furrows which subdivide the higher types of cortex into numerous convolutions.

November 1.—Mr. Francis Jones, president, in the chair.—Dr. A. N. **Meldrum**: The development of the atomic theory. (ii) The various accounts of the origin of Dalton's theory. (iii) Newton's theory and its influence in the eighteenth century. There are numerous accounts of the genesis of Dalton's theory, one of which comes from W. C. Henry, another from Thomas Thomson, a third from J. A. Ransome, and two come direct from Dalton. All the narratives come from Dalton originally, for Henry, Thomson, and Ransome based theirs on conversations they had with him. The discrepancies between these various accounts can be explained only on the supposition that Dalton was deficient in historical instinct, and never appreciated the difference between describing the genesis of his theory and expounding the theory itself. The main conclusions of the second paper are (1) that Newton's contribution to the development of the atomic theory was made under the influence of Descartes; (2) that Newton exerted an influence in the eighteenth century on Bryan Higgins, and through him on William Higgins. The atomic theory advanced by Bryan Higgins (1776) and amplified by William Higgins (1789) can be understood only when regarded as springing from Newton's theory under the conditions of the time. Those conditions were:—(*a*) the knowledge due to Priestley of different kinds of gases, and (*b*) the new light which Lavoisier threw on chemical composition, consequent on Priestley's discovery of oxygen.

PARIS.

Academy of Sciences, November 7.—M. Emile Picard in the chair.—M. **Bassot**: Halley's comet. Observations of this comet were made at the Observatory of Nice on November 2 and 3. It is visible in the morning a little before sunrise. The sky was covered on the nights of November 4 and 5, but in spite of the absence of a third observation there is no doubt of the identity of the comet.—A. **Müntz**: The struggle for water between the soil and the seed. For each specific kind of soil there is a definite percentage of moisture, below which the seed, instead of gaining moisture, actually loses it. For the seed to absorb sufficient water to be able to germinate, a higher percentage of moisture, fixed for each class of soil, is necessary. Thus in a sandy soil 0·5 per cent. of water is sufficient for germination; with loams the required percentage of water is from 2½ to 7·7 per cent., according as the proportion of clay increases; with a garden soil containing a large proportion of humus, nearly 19 per cent. of water must be present before germination can take place.—Charles **Nordmann**: A means of determining by colour photometry the parallaxes of a certain class of stars. First application to two stars. The method applied to Algol gives a distance of 59 years of light, or a parallax of 0·055″, a figure in good agreement with the 0·051″ given for this star by M. Bijourdan in his recent catalogue of stellar parallaxes. The same method applied to δ Libra gives a distance of 355 years of light and a parallax of 0·009″.—A. **Demoulin**: Certain couples of triple-orthogonal systems.—W. **Stekloff**: The development of an arbitrary function in series of fundamental functions.—L. **Favé** and L. **Driencourt**: Observations of the tides made at sea in the Channel and the North Sea. A self-recording instrument has been devised by the authors which, when placed on the sea floor, measures pressure variations directly, from which the changes of level due to the tides can be deduced. An automatic differential arrangement renders the sensibility very nearly independent of the depth. A diagram is given of observations taken at a point situated 52° 29′ N., 0° 47′ E., and the bearing of these data upon Whewell's work on the tides of the North Sea is discussed.—A. **Petot**: Unsymmetrical motors.—Eugene **Bloch**: The action of a magnetic field on the electric

discharge. The author has repeated and confirmed some experiments recently made by M. Gouy, and finds that there is a particular strength of the magnetic field which facilitates the maximum discharge. It is shown that this curious phenomenon is in general agreement with the modern theory of disruptive discharge.—J. **de Kowalski**: Progressive phosphorescence at low temperatures.—A. **Guntz** and M. **Galliot**: The preparation of crystallised strontium. A mixture of strontia and aluminium powder is placed in the lower half of a steel tube closed at one end. This is enclosed in a porcelain tube, a high vacuum being maintained in the latter. The temperature of the mixture is gradually raised to 1000° C.; after cooling, the inside of the cool portion of the tube is covered with a deposit of crystalline strontium. The yield is good, nearly 75 per cent. of the theoretical quantity, and the metal contains only 0·5 per cent. of impurities.—E. **Berger**: Tetranitromethane. This substance is obtained by the action of pure nitric acid upon acetic anhydride in acetic acid solution. The exact conditions necessary for a good yield (50 per cent. of the theory) are given in detail. The physical constants and the heat of combustion were determined.—E. **Kayser**: The influence of nitrates on alcoholic ferments. Alcoholic fermentation is more complete in presence of manganese nitrate, and for each strain of yeast there is an optimum amount of salt, the addition of which produces a maximum of diastatic activity.—G. **Malfitano** and Mlle. A. N. **Moschkoff**: The purification of starch. A 1 per cent. colloidal solution of starch is prepared, the turbid liquid frozen and allowed to melt. The clear liquid thus obtained holds in solution the greater part of the mineral impurities and very little starch; the bulk of the latter deposits in flocculent form, and can be separated by filtration or by centrifugation. After four or five repetitions of this treatment a starch is obtained which gives less than 0·02 per cent. of ash. The properties of starch thus purified are compared with those of ordinary starch.—M. **Marage**: Subjective noises in the ear. A classification of the various kinds of subjective noises in the ear in accordance with their pathological causes.—Henri **Labbe**: The distribution of nitrogen in the intestinal excreta. The dried excreta were extracted successively with various solvents, and the nitrogen determined in each extract.—S. **Lalou**: The variations in the quantity and composition of the pancreatic juice during secretions brought about by secretin. Repeated injections of secretin produce a regular secretion of pancreatic juice during a long period. The juice thus obtained is not of strictly constant composition; its alkalinity and diastatic activity diminish, this diminution being especially marked as regards the lipase.—P. **Chaussé**: Latent mesenteric tuberculosis produced experimentally in the dog. The injection of tuberculous products in the normal dog produced no visible lesions after six months. Latent mesenteric tuberculosis was, however, easily shown to exist in the majority of the dogs under experiment.—M. **Fabre-Domergue**: The food of the oyster and the mechanism of its contamination in impure water.—R. **Robinson**: Contribution to the study of the venous circulation in the lower limbs.—Paul **Marchal**: Contribution to the biological study of Chermes.—A. **Quidor**: The evolution and affinities of the Philichthydæ.—O. **Mengel**: Geology of the primary islet of La Guardia between Segre and Noguera Pallaresa.—H. **Mansuy**: The stratigraphic succession in the neighbourhood of Luang-Prabang.—Maurice **Leriche**: The first fossil fishes met with in the Belgian Congo in the Lualaba strata.

DIARY OF SOCIETIES.

THURSDAY, NOVEMBER 17.

ROYAL SOCIETY, at 4.30.—On the Effect of Gravity upon the Movements and Aggregation of *Euglena viridis*, Ehrb., and other Micro-organisms: Harold Wager. F.R.S.—The Proteolytic Enzyme of Drosera: Miss Jean White.—The Influence of Bacterial Endotoxins on Phagocytosis (including a new method for the Differentiation of Bacteria). (Second Report): L. S. Dudgeon, P. N. Panton, and H. A. F. Wilson.—On the State of Aggregation of Matter. Part I. On the Action of Salts in Heterogeneous Systems, and on the Nature of the Globulins. Part II. On the Action of Formaldehyde on Witte's Peptone. Part III. On the Solubility of Phenol and certain Crystalline Substances in Salt Solutions: Dr. S. B. Schryver.—A Method for Isolating and Growing the Leprosy Bacillus of Man: F. W. Twort.—The Oxidation of Phenol by certain Bacteria in Pure Culture: G. J. Fowler, E. Ardern, and W. T. Lockett.

LINNEAN SOCIETY, at 8.—(1) Theoretical Origin of *Plantago maritima* and *P. alpina*, from *P. coronopus*; (2) Supplementary Observations on the Theory of Monocotyledons being derived from Aquatic Dicotyledons: Rev. George Henslow.

ROYAL GEOGRAPHICAL SOCIETY, at 5.—Research Meeting. Origin of the Present Geography of Northern Nigeria: Dr. J. D. Falconer.

FRIDAY, NOVEMBER 18.

INSTITUTION OF MECHANICAL ENGINEERS, at 8.—The Development of Road Locomotion in Recent Years: L. A. Legros.

MONDAY, NOVEMBER 21.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—The Duke of Abruzzi's Karakoram Expedition: Dr. Filippo de Filippi.

ROYAL SOCIETY OF ARTS, at 8.—Industrial Pyrometry: C. R. Darling.

TUESDAY, NOVEMBER 22.

ROYAL ANTHROPOLOGICAL INSTITUTE, at 8.30.—The Arrival of Man in Britain in the Pleistocene Age: Prof. W. Boyd Dawkins, F.R.S.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Portland Cement, and the Question of its Aeration: H. K. G. Bamber.

WEDNESDAY, NOVEMBER 23.

ROYAL SOCIETY OF ARTS, at 8.—Methods of Detecting Fire-damp in Mines: Sir Henry H. Cunynghame, K.C.B.

GEOLOGICAL SOCIETY, at 8.—The Effects of Secular Oscillations in Egypt during the Cretaceous and Eocene Periods: Dr. W. F. Hume.—The Origin of the British Trias: A. R. Horwood.

THURSDAY, NOVEMBER 24.

ROYAL SOCIETY, at 4.30.—*Probable Papers*: Colour-blindness and the Trichromatic Theory. Part II. Incomplete Red or Green Blindness: Sir W. de W. Abney, K.C.B., F.R.S.—On the Sequence of Chemical Forms in Stellar Spectra: Sir N. Lockyer, K.C.B., F.R.S.—The Influence of Viscosity on the Stability of the Flow of Fluids: A. Mallock, F.R.S.—An Electrostatic Voltmeter for Photographic Recording of the Atmospheric Potential: G. W. Walker.—Optical Dispersion, an Analysis of its Actual Dependence upon Physical Conditions: Dr. T. H. Havelock.—The Spectrum of Halley's Comet: C. P. Butler.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Street Lighting by Modern Electric Lamps: H. T. Harrison.

FRIDAY, NOVEMBER 25.

PHYSICAL SOCIETY, at 5.—The Electric Stress at which Ionisation begins in Air: Dr. A. Russell.—On the Measurement of a Flow of Water in a Closed Circuit by a method involving little or no Statical Friction: Dr. A. Griffiths.—Exhibition of a Surface Brightness Photometer: J. S. Dow.—The Approximate Solution of various Boundary Problems by Surface Integration combined with Freehand Graphs: L. F. Richardson.—The After-glow produced in Gases by Electric Discharge: Prof. R. J. Strutt, F.R.S.

CONTENTS.