

## Calendar of Discovery and Invention.

January 16, 1834.—After a voyage of two months from Portsmouth, Sir John Herschel, on Jan. 16, 1834, reached Cape Town. Re-erecting his famous 20-foot telescope at Feldhausen, near the base of Table Mountain, during the next four years he carried out his great survey of the southern hemisphere, observing more than 4000 nebulae and star clusters, and 2095 double stars. He also made many observations of relative stellar brightness, of Halley's comet, of the satellites of Jupiter, and of sunspots.

January 17, 1783.—Of capital importance in the industrial development of Great Britain were the two inventions of Henry Cort—the rolling mill and the puddling furnace. The former was patented on Jan. 17, 1783, the latter on Feb. 13, 1784. Dudley, the Darbys, Huntsman, and others, had improved the methods of making cast iron and steel, but the main British supply of wrought iron came from Sweden and Russia. Cort's improvements were the results of years of work at his foundry at Fareham, but no sooner had he brought out his invention than misfortune befell him and he was completely ruined. England, however, benefited immensely by his work, and by 1860, just before the Bessemer process was taken up, there were 8000 puddling furnaces in use.

January 17, 1867.—On Dec. 4, 1866, Werner Siemens had written to William Siemens: "I have had a new idea, which in all probability will succeed and may give important results." What that idea was, was disclosed in a paper read to the Berlin Academy of Sciences on Jan. 17, 1867. Werner Siemens then described the first dynamo. In sending the description to his brother for the Royal Society, Werner remarked: "It is successful beyond expectation even in small dimensions. It will be a most important thing." Wheatstone's invention of the dynamo was contemporary, but Werner Siemens was the first to publish particulars of such a machine.

January 18, 1799.—Paper making is one of the oldest industries, but the first to invent an endless paper-making machine was Louis Robert, an employee of François Didot, of Essones, France. A patent was granted to Robert on Jan. 18, 1799, and in the following years the French Government awarded him 8000 francs. The first machine, however, was made by Hall, of Dartford, and in 1804 the patent was purchased by Henry Fourdrinier, who spent £60,000 on improving it. In England at the present time there are about 260 paper-mills, with a total annual output of 1½ million tons of paper.

January 20, 1881.—The evolution of the solar system is regarded as one of the most interesting questions presented by modern astronomy, and to this question G. H. Darwin devoted many years of his life. One of his most important papers was read to the Royal Society on Jan. 20, 1881. He showed that in consequence of the effects of tidal friction, the evolution of the earth and moon had been probably unique in the solar system and concluded that as a result of the tides our day and the time of revolution of the moon in its orbit are both lengthening.

January 21, 1795.—During the French Revolution the Committee of Public Welfare took up the matter of education. In September 1794 it was decided "there should be established in Paris a normal school where instruction in the art of teaching science should be given to persons already possessing scientific knowledge." Through this came the foundation of the Ecole Normale, which began its work on Jan. 21, 1795.

E. C. S.

## Societies and Academies.

LONDON.

Linnean Society, Dec. 2.—J. Ramsbottom: The Society of Amateur Botanists. Mordecai Cubitt Cooke (1825–1914) was appointed head master of the new Trinity School, Lambeth, at the age of twenty-three years. Here he conducted evening botanical classes under the old Science and Art Department. In the later 'fifties he occasionally took his pupils for country rambles. Afterwards they were joined by outsiders, and in 1860 constituted themselves into the Society of Amateur Botanists. This was planned for excursions, interchange of specimens, communication of papers, and the establishment of a library, herbarium, and museum. Cooke was the first and only president. Excursions were held on alternate Saturdays and meetings on alternate Wednesdays. The meetings were held first at the Metropolitan Club, Edgware Road, and then over the shop in Piccadilly of Robert Hardwicke, the publisher of natural history works. A letter in the first volume of *Hardwicke's Science Gossip* (1865) from W. Gibson, suggesting an association of amateur microscopists "something on the plan of the Society of Amateur Botanists," led to the formation of the Quekett Microscopical Club. The new club enrolled 155 members in its first year. Excursions were carried out as with the Society of Amateur Botanists, many of whose members joined the new club. The Society languished and may be said to have been killed by the Quekett.—C. E. Salmon: Some interesting British plants. *Myosotis brevifolia* Salm. is a new species, found in marshes in the Cross Fell district, and bearing short, broad, blunt leaves; it produces numerous rooting stolons above ground; its corolla is pale blue, almost as large as that of *M. repens*, the calyx is deeply divided, rather more than half-way, and the segments are oblong, rounded or blunt at the apex; its style is very short. Other plants were also described.

Dec. 16.—E. Ashby: Notes on the flora of the Grampian Mountains of Victoria, Australia. The range is situated in Western Victoria, and covers an area of about 60 miles by 30 miles; the rocks are sandstone, with quartzite and intrusive rock in a few places. It forms an ecological islet rising abruptly from hundreds of miles of undulating plains, and is a meeting-place of the east and west as regards its flora. Fifteen species are endemic, including four species of the Leguminous genus *Pultenæa*, and a terrestrial orchid, *Caladenia iridescens*, which flourishes high up in the barren stony mountain soil.—W. T. Calman: The giant teredo. The giant teredo, *Kuphus arenarius* (Linn.), first described by Rumphius two hundred years ago, has hitherto been known chiefly by its massive shelly tube, which may be so much as four feet in length and three inches in diameter at the wider end. A complete specimen was collected by Capt. Burgess, of the Mission steamer *Southern Cross*, in the Solomon Islands. It comprises some thirteen inches of the posterior end of the body, with the siphons and pallets. Instead of boring in wood like the other Teredinidæ, *Kuphus* lives embedded in the mud of mangrove-swamps, with the siphons projecting from the surface. Possibly it is the full-grown condition of a timber-boring species (perhaps *Teredo manni*) which is set free by the decay of the wood.—J. R. Norman: Ambicoloration and associated variations in flat-fishes. Ambicoloration in flat-fishes is of particular interest on account of the other variations towards symmetry which accompany complete (or almost complete) pigmentation of the blind side. The modification of

the scales on the blind side to resemble those of the ocular side in the dab, and the development of bony tubercles on the blind side of the body in the turbot are characteristic variations of this nature. Another correlated variation is the delayed or arrested migration of the eye, which leads to the formation of a characteristic fleshy hook on the head. In the southern flounder of Australia, in which only a single pelvic fin is normally developed, two symmetrical pelvics of equal size are present in completely ambicolorate examples. The tendency is for ambicoloration in flat-fishes to affect the head last of all.

**Geological Society, Dec. 15.**—J. H. Davies and A. E. Trueman: A revision of the non-marine lamellibranchs of the Coal Measures, and a discussion of their zonal sequence. The Coal Measure lamellibranchs of the genera *Carbonicola*, *Anthracomya*, and *Naiadites* are discussed. A description of the sequence in South Wales is given and six zones are recognised. The succession in the north of France is closely comparable with that in South Wales. The relative abundance of the various genera is different, possibly indicating somewhat different conditions of deposition. The sequence in North Staffordshire is also discussed. It is concluded that the lamellibranchs afford a reliable basis for the correlation of the Coal Measures, and especially of that part of the Coal Measures which contains the more important seams.—L. Merson Davies: The Ranikot beds of Thal (North-West Frontier Provinces of India). Ranikot beds have never before been known to exist in India outside a very limited area in Sind; the new exposures are at Thal, on the Afghan frontier, more than 500 miles north of any hitherto known of the kind. Many new species, mostly corals, are found in the Thal beds. A particular examination has been made of the foraminifera of the Thal beds. The age of the Ranikot series is pre-Ypresian. The Upper Ranikot may be correlated with the Middle Landenian of Europe, and the Lower Ranikot with the Lowest Landenian and Montian.

## DUBLIN.

**Royal Dublin Society, November 23.**—H. H. Dixon and T. A. Bennet-Clark: The electrical stimulation of plant tissues. The passage of an electrical current through a tissue leads to a change in electrical resistance and to a change in permeability. The stimulating current used was a sine-wave single-phase alternating current of 50 cycles, of which the voltage was controlled by a potentiometer, and the duration of the stimulus by a pendulum device. Pieces of ivy (*Hedera helix*) leaf, cut 1 cm. square, were used and were found to maintain a nearly constant resistance in the apparatus for so long as three days. A moderate stimulus (say 120 volts for 0.1 sec.) is immediately followed by a very rapid fall in resistance, which becomes less and less rapid, and, after a few minutes, the resistance rises a little and falls again. Finally, it starts to rise slowly, recovering in about an hour to the value it originally had before stimulation. Both a positive and negative deviation of resistance is initiated by the stimulus: their relative magnitudes depend on the magnitude of the stimulus. The smallest possible current causes a response if a certain minimal potential across the membrane is exceeded, and as the stimuli are increased, at first the positive reactions increase the more rapidly and predominate over the negative; with still larger stimuli the negative reactions predominate to an increasingly great extent over the positive reactions, which finally become unnoticeable after very large stimuli. The positive reactions only predominate within a small range of intensities of stimulus, and also only when

the energy content of the stimulus is less than 0.01 joule under the conditions of these experiments. With stimuli all of the same energy content, the higher the intensity at which this energy is supplied the more effective it is. The relation between the intensity and the response is S-shaped. In consequence of this it is suggested that a given quantity of energy produces in any cell a definite alteration of resistance whatever the voltage at which it is supplied. It is supposed that the ability of a current to stimulate a cell is determined by the potential difference across the membranes of one cell. A series of stimuli to a single leaf square gives the same response as a single one of the combined duration of the series, provided that the intervals are not too long. We could not detect any conduction of the stimulus from the stimulated zone to any other region of the leaf. Advance of the season and also rise of temperature greatly increased the sensitivity of the tissues; the positive and negative reactions were not affected to the same extent.—H. P. Lewis: *Caninia cylindrica* Scouler and other large *Caninias* from the carboniferous limestone of Ireland.

**Royal Irish Academy, November 30.**—J. J. Nolan and G. P. de Sachy: Atmospheric ionisation. The conditions of equilibrium between small ions, nuclei, and large ions in the atmosphere are investigated. It is shown that, when positive and negative large ions are present in equal numbers, the ratio of the concentration of the small ions of the two signs is connected with the ratio of their mobilities by the equation  $n_+/n_- = (k_+/k_-)^m$ , where  $m$  is not far from unity and possibly  $\frac{3}{2}$ . For  $n_+/n_-$  in atmospheric air the value 1.24 is found. In room air  $n_+/n_- = 1.11$  and  $k_+/k_- = 1.16$ . The value of the recombination constants of small ions, positive and negative, with large ions and nuclei are determined. It is found that both small and large atmospheric ions may be resolved into a number of distinct groups.

## EDINBURGH.

**Royal Society of Edinburgh, December 6.**—H. Graham Cannon and Miss S. M. Manton: On the feeding mechanism of a mysid crustacean (*Hemimysis Lamornæ*). This organism feeds on large food masses and on minute suspended particles filtered from the surrounding water. The food stream is produced by the rotary swimming movements of the exopodite of the trunk limbs, aided by a paddle-like action of the maxillary exite. The suspended particles are filtered off by the proximal endite of the maxilla and pushed into the mouth by the combined action of maxillules, maxillæ, and the proximal endite of the first trunk limb. Large food masses are held by the mandibular palps and bitten into by both the incisor processes of the mandibles and by the distal endites of the maxillules. Storch's view that the primitive feeding mechanism of the Crustacea is a filter-feeding process is criticised, and an alternative hypothesis that it resulted from the paddling activities of primitive biramous appendages is put forward.—J. H. Awbery and Ezer Griffiths: Further experiments with the Ewing ball-and-tube flowmeter. This instrument measures the rate of flow of liquid or gas by the height to which a sphere is carried up a conical glass tube. The results of varying the liquid, the size of the sphere, and the inclination of the meter, have been investigated, and the observations are grouped together by making use of the theory of similitude. There is apparently no simple method of calibrating the instrument for one liquid from the results obtained with another.—E. A. Baker: The law of blackening of the photographic plate at low densities. (Second Paper.) iv.—Results for isochromatic and blue-sensitive plates and filtered light. Further low

density results are given, and explained on the assumption that the formation of the latent image takes place in two stages, the first being reversible, with the further assumptions that the number of absorbers in a grain is small, and that they are of at least two kinds.—Frederick Walker: The igneous geology of Ardsheal Hill. The summit of Ardsheal Hill is an igneous complex formed of a number of rock types of varied composition. The four principal types are kantalenite, appinite, granophyre, and hornblende-porphyrity. In common with other neighbouring intrusions, this complex is probably of Lower Devonian age.

## PARIS.

Academy of Sciences, Nov. 29.—Emile Borel: A theorem on the linear forms with a symmetrical skew determinant.—H. Andoyer: The method of Delaunay.—Georges Perrier: The parallel of Meknès (triangulation and levelling).—P. Villard: The utilisation of the energy of naturally occurring warm water. Remarks on the subject of the note by G. Claude and P. Boucherot. The energy of hot springs could be more easily utilised in the manner suggested by G. Claude and P. Boucherot than that derived from tropical seas.—F. Widal and M. Laudat: Study of the modifications brought about in the nitrogen formula of blood serum by renal impermeability. Study of the distribution of the nitrogen compounds in a case of Bright's disease.—Georges Claude: The utilisation of the thermal energy of the sea. In January 1923 Tito Romagnoli published a paper on the utilisation of the thermal energy of the deep Italian lakes which to some extent anticipates the recent communication by the author on the same subject. Campbell in 1913 also made similar suggestions.—G. Sauvageau: Remarks on a note by Chemin and Legendre on the existence of free iodine in *Falkenbergia Doubletii*. Reply to criticism.—Krawtchouk: The distribution of prime numbers.—Enea Bortolotti: The angle of two conjugated directions.—René Garnier: Plateau's problem.—V. Smirnov: The series of polynomials.—André Roussel: The extremum of certain double integrals.—Podtiaguine: The theory of growth [of functions].—H. Galbrun: Sound waves and zones of silence in the atmosphere.—Paul Stroobant: The movement of the whole of the helium stars.—L. d'Azambuja. The structure of the solar chromosphere.—Jarry-Desloges: Contribution to the study of the planet Mars. During 1926, Mars underwent important superficial modifications, greater than any observed during the preceding twenty years. Details of the observed changes are given.—Robert Lévi: The atom in the theory of universal and discontinuous action.—C. Ledoux: Method and apparatus for rapidly calculating the point in radiogoniometry.—Mlle. Paule Collet: Paramagnetism independent of temperature. Solid potassium permanganate, after purification by numerous recrystallisations, has a paramagnetism independent of the temperature, and this is the same as the salt in solution within the limits of experimental error. This salt forms a third example not in agreement with the law of Curie.—A. Danjon: The interferential study of scintillation and the conditions of stability of telescopic images. The diameters of stellar images take, under the effect of atmospheric agitation, values which are independent of the aperture of the objective when the latter exceeds 1 metre. Lord Rayleigh's rule applies to the deformation of images produced by scintillation.—C. Mihul: The structure of the third order of spectrum of oxygen.—D. K. Yovanovitch and Mlle. A. Dorabalska: The calorific effect of the  $\beta$  and  $\gamma$ -rays of radiothorium.—Mme. E. Tiegler-Soru: The ultraviolet spectrum of

potassium nitrate and its variations as a function of the pH.—E. Raguin: The tectonic situation of the marbles of flaky structure near the Col de la Leysse (Savoy).—Yves Milon: The presence of glaucon in the Vindobonian shell marls of Brittany.—L. Joleaud: The tectonic of the Carib regions of South-American Columbia.—N. Menchikoff: Geological observations made in the course of the expedition of Prince Kemal-Dine Hussein in the Lybian desert (1925–1926).—L. Blaringhem: The segregation in mosaic of the fertile hybrids of wheat and barley.—Jules Amar: Oxygen-carbon dioxide antagonism. The antagonism of the two principal gases of the blood, oxygen and carbon dioxide, normally conditions the respiratory working. By increasing the proportion of either gas a mechanism of defence can be set up against intoxication by breathlessness, over-fatigue, stuffy atmosphere, and it is a method of treatment of respiratory syncope.—J. G. Szuman: The influence of the testicle on metabolism in the Gallinaceae.—Mme. L. Randoïn and Mlle. A. Michaux: Comparative variations in the content of the suprarenal capsules in water, fatty acids, and cholesterol in the normal guinea-pig and in the guinea-pig submitted to a diet minus the antiscorbutic vitamin. The most marked change in the suprarenal capsules of guinea-pigs with experimental scurvy is the continuous fall in the proportion of cholesterol present. The proportion of fatty acids falls at first, but afterwards regains the normal. The water remains constant.—J. Benoit: The histophysiological study of the testicular nodules of regeneration in the domestic cock.—Gilbert Ranson: The resistance of young *Gryphoeca angulata*, to heat and their exceptional mortality in 1926.—Emile André and Henri Canal: The oil of *Mesoplodon bidens*. This oil resembles cachalot oil and oil of *Hyperoodon rostratus*. These three oils form a chemically homogenous group, the composition of which constitutes a marked physiological character of survivors of a fauna now extinct.—Georges Truffaut and N. Bezssonoff: The conditions which allow of co-operation between nitrogen-fixing bacteria and maize.

## ROME.

Royal National Academy of the Lincei, Nov. 7.—G. Armellini: The difference between the visual magnitude and the bolometric magnitude of stars in relation to the absolute temperature.—L. Herrera: Appearances of struggle and of parasitism with simulations of infusoria. The name "colpoids" is suggested for the infusoria-like preparations made from soap solution and a solution of olive oil in petrol. These colpoids are spherical, elliptical, or of irregular and often ameboid form. Their dimensions vary from 100 to 800 microns or even more, and many of them are visible to the naked eye. Certain of the phenomena accompanying their mutual encounters exhibit very close resemblance to those observed with the struggling and parasitism of living infusoria.—Alessandro Terracini: Characterisation of Bianchi's systems of  $\infty$  surfaces.—E. Raimondi: Approximate calculation of the dynamic effect of a current flowing between a lamina and an indefinite plane wall.—Arnaldo Masotti: Uniform translation of a circular cylinder in a channel with plane parallel edges.—U. Barbieri: Astronomical determination of latitude computed at Mondovi in 1925.—Bianca Nannei: Cycles of elastic hysteresis in bismuth wires. The cycles followed by the elastic behaviour of steel and iron wires are due principally to a hereditary elastic effect which is gradually dissipated, whereas with bismuth wires they represent a phenomenon of permanent deformation, also distinctly hereditary in character.—Umberto Crudeli: Electromagnetic fields

having the electric (magnetic) field zero at the circumference and the magnetic (electric) field tangential at the circumference.—M. Philibert: Further observations on the apparent duplication of the optic axis of calcite by Federow's plate. This duplication is only apparent and is caused by the anisotropy of the spherical segments of the Federow's plate, which behave like a doubly refracting biaxial substance. Far from being negligible, this double refraction of the segments gave rise to an axial angle of  $14^\circ$  in one case investigated.—G. Carobbi: New researches on noteworthy Vesuvian sublimates. Microscopic and crystallographic examination of material from the inner walls of a fumarole situated in a laval canal of the cupola formed on Vesuvius in April-May 1924 reveals the presence of boric acid in the form of sassoline and of potassium fluoborate as avogadrite.—Guido Cusmano: New process of dehydrogenation of menthol. When sodium is heated with menthol to about  $300^\circ$ , hydrogen is liberated in abundance and the mass becomes spongy, the sodium mentholate first formed losing hydrogen (2 atoms) to form a sodio-menthone, which again loses hydrogen (4 atoms) to yield sodium thymolate.—G. Scagliarini and G. Tartarini: Additive compounds of halides of bivalent metals with organic bases (iii). With cobalt and nickel chlorides and cobalt bromide, urotropine forms additive compounds of the form,  $\text{CoCl}_2 \cdot \text{C}_6\text{H}_{12}\text{N}_4$ .—Ettore Remotti: Photo-reactive behaviour in tadpoles and fry fed with thyrod. When tadpoles and the fry of *Salmo lacustris* and *S. irideus* are subjected to treatment with thyrod, their sera undergo important modifications in the colloidal equilibrium, these modifications being attributable partly to increased dispersion.—Silvio Ranzi: Investigations on the placodes of Cyclostomi, Ganoidei and Teleostei with respect particularly to the fate of the first epibranchial placode.—Constantino Gorini: Behaviour of *Bacterium typhi* in milk. Contrary to the opinion held up to the present, the typhus bacillus is capable of coagulating milk. The mechanism of the change is novel and peculiar and consists of an alkalinizing, solubilising phase, followed by an acidifying and coagulating phase. The former phase is preceded by a transitory acidification, the conclusion drawn being that the organism is able to attack lactose, but prefers the casein, which is first proteolysed with production of bases. In the favourable medium thus created, the lactose is decomposed with development of acidity. The passage from the first to the second phase would be characterised by a process of reversion of the casein from the dissolved to the colloidal state.

## SYDNEY.

Linnean Society of New South Wales, Oct. 27.—J. R. Malloch: Notes on Australian Diptera (ix).—Two genera and ten species are described as new in the families Ephyrinae, Agromyzidae, Ortalidae, Sapromyzidae, Helomyzidae, Neottiophilidae and Muscidae, the new genera belonging to Ortalidae and Muscidae.—Lucy M. Wood: On some land planarians from Barrington Tops, N.S.W., with descriptions of new species. The collection described comprises six species, representing the three genera Geoplana, Artioposthia and Platydemus, four of the species being regarded as new.—E. W. Ferguson: Revision of Australian Syrphidae (Diptera). Part ii. Subfamily Milesiinae. Five genera (1 new) and 21 species (10 new) are described. Four species of Graptomyza (subfamily Volucellinae) are also described, three of them being new.

## VIENNA.

Academy of Science, November 18.—L. Moser and A. Brukl: Determination and separation of the rare metals from other metals (viii). Determina-

tion of thallium as thallium chromate and its separation from other elements. Sulphosalicylic acid is used to separate some metals, potassium cyanide and sodium thiosulphate separate others.—A. Winkler: Geological studies in the tertiary region of south-west Styria. Conglomerates and delta deposits.—R. Seka and O. Schmidt: Amino-derivatives of dinaphthanthracene-diquinone.—O. Kühn: A new hydrozoon from the Jura of Stramberg.—L. Waldmann: The geological structure of the Moldau-Danubian primitive rocks on the map sheet Gmünd.—H. Küpper: The facies relations of the newer palaeozoic in Carinthia. Limestones and the Carboniferous.—E. Jahoda: Luminescence and coloration of alkali chlorides when treated with Becquerel rays. A red fluorescence was due to the presence of manganese.

## Official Publications Received.

## BRITISH AND COLONIAL.

The Deeside Field. (Issued under the Auspices of the Deeside Field Club.) Third number. Edited by J. B. Philip. Pp. vi+88+23 plates. (Aberdeen: D. Wyllie and Son.) 3s. 6d.

Transactions of the Optical Society. Vol. 27, No. 5. Pp. ii+277-336+xiv. (London: Optical Society, Imperial College of Science.) 10s.

Transactions of the Royal Society of Edinburgh. Vol. 55, Part 1, No. 6: The Development of the Hypophysis Cerebri in Man, with a Note upon its Structure in the Human Adult. By Dr. David Waterston. Pp. 125-145+3 plates. (Edinburgh: Robert Grant and Son; London: Williams and Norgate, Ltd.) 4s.

Proceedings of the Liverpool Geological Society. Session the Sixty-seventh, 1925-1926. Part 3, Vol. 14. Edited by C. B. Travis. Pp. xvi+197-234+3 plates. (Liverpool.)

## FOREIGN.

Bulletin of the American Museum of Natural History. Vol. 56, Art. 4: Contribution to the Knowledge of the Fossil Hyracoidea of the Fayum, Egypt, with Description of several New Species. By H. Matsumoto. Pp. 253-350. (New York City.)

Proceedings of the United States National Museum. Vol. 69, Art. 21: Distributional Notes on some Neotropical Bugs of the Family Nabidae, with Description of a New Species. By Halbert M. Harris. (No. 2647.) Pp. 4. (Washington, D.C.: Government Printing Office.)

The American Museum of Natural History. Guide Leaflet Series, No. 65: The Art of the Lapidary. By Herbert P. Whitlock. Pp. 29. (New York City.)

## CATALOGUES.

Catalogue of B.D.H. Fine Chemical Products, including Organic and Inorganic Chemicals, Analytical Reagents, Indicators, Standard Stains. Pp. 108. (London: The British Drug Houses, Ltd.)

## Diary of Societies.

## SATURDAY, JANUARY 15.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS (at Neville Hall, Newcastle-upon-Tyne), at 3.—J. S. Carson: Dry Cleaning of Coal.—Paper by L. F. H. Booth, Screening and Washing Plant at Deaf Hill Colliery, open for further discussion.

INSTITUTE OF BRITISH FOUNDRYMEN (Lancashire Branch, Junior Section) (at Manchester College of Technology), at 7.—W. Jolley: My Impressions of American Foundries.

## MONDAY, JANUARY 17.

CAMBRIDGE PHILOSOPHICAL SOCIETY (at School of Agriculture, Cambridge), at 4.30.—Prof. T. B. Wood: Animal Calorimetry.

VICTORIA INSTITUTE (at Central Buildings, Westminster), at 4.30.—G. B. Michell: The Comparative Chronology of Ancient Nations in its Bearing on Holy Scripture.

ROYAL GEOGRAPHICAL SOCIETY (at Lowther Lodge, Kensington Gore), at 5.—G. S. Laird-Clowes: Ships of Early Explorers.

INSTITUTE OF ELECTRICAL ENGINEERS (North-Eastern Circle) (at Armstrong College, Newcastle-upon-Tyne), at 7.—Prof. W. M. Thornton: What is Electricity? (Faraday Lecture).

INSTITUTE OF ELECTRICAL ENGINEERS (Teesside Sub-Centre) (at Cleveland Technical Institute, Middlesbrough), at 7.—L. C. Grant: Wired Wireless.

INSTITUTE OF AUTOMOBILE ENGINEERS (Scottish Centre) (at Royal Technical College, Glasgow), at 7.30.—A. N. May: Electric Lighting for Public Service Vehicles.

ROYAL INSTITUTE OF BRITISH ARCHITECTS, at 8.—Award of Prizes and Studentships.

ROYAL SOCIETY OF ARTS, at 8.—Dr. L. C. Maitin: Recent Progress in Optics (Cantor Lectures) (1).

HUNTERIAN SOCIETY (at Mansion House), at 9.—Dr. J. M. T. Finney: The Influence of John Hunter on American Surgery.

ROYAL SOCIETY OF MEDICINE (Social Evening), at 9.30.—Prof. A. W. Sheen: Medicine in Ancient Greece.

CHEMICAL INDUSTRY CLUB.

## TUESDAY, JANUARY 18.

SOCIETY OF GLASS TECHNOLOGY (at Manchester College of Technology), at 2.30.—Prof. W. E. S. Turner: The Effect of Cullet on the Melting of Glass.—Prof. J. F. Ponomareff: Investigation of the Glassy State by the Method of Forced Crystallisation.—Violet Dimbleby and Prof. W. E. S. Turner: The Durability of Some Soda-Lime Magnesia Glasses.—Prof. W. E. S. Turner and F. Winks: The Thermal Expansions of Some Boric Oxide Containing Glasses.