

Societies and Academies.

LONDON.

Royal Society, May 5.—Prof. C. S. Sherrington, president, in the chair.—Dr. H. Head: Release of function in the nervous system (Croonian lecture). Hughlings Jackson's law that destructive lesions do not cause positive effects, but induce a negative condition, which permits positive symptoms to appear. Control of higher over lower centres. Structural lesions may remove this dominance and so reveal the activity of subordinate centres; this is "disintegration" of function. Should the stimulus become abnormally intense or central resistance be weakened, forms of reaction may break through which are normally suppressed; this is "escape from control."

Physical Society, March 22.—Prof. W. Eccles, vice-president, in the chair.—W. N. Bond: The effect of viscosity on orifice flows. Determinations were made of the coefficient of discharge through an orifice 0.1469 cm. in diameter of solutions of glycerine and water, varying in kinematic viscosity from 0.01 to 7. The results are plotted in a manner which combines both purely viscous and purely turbulent flows in one graph. The effect of slight viscosity is to increase the coefficient of discharge.—Dr. A. Griffiths and Constance H. Griffiths: Viscosity of water and low rates of shear. The determination of the coefficient of viscosity of water by a method in which water is forced along glass capillary tubes of 1.5 to 2.0 mm. bore at rates of flow varying from 1 litre in two years to 1 litre in twenty-four years. The liquid fills a closed tubular circuit which for purposes of description may be said to be rectangular in shape, two of the tubes being horizontal and two vertical. The circulation is caused by a difference of density obtained by having a weak solution of uranine in one vertical tube and pure water in the other. Values for the coefficient of viscosity are given. There is no experimental evidence that at the extremely low rates of shear the viscosity of air-free water in glass capillary tubes differs from its value at normal rates of shear.—B. S. Smith and G. F. Partridge: A method of measuring frequencies. A heterodyne method of measuring frequency by comparison with a calibrated valve oscillator. Calibration is performed by means of two valve oscillators capable of giving frequencies of 1000/sec. upwards. The frequency of the oscillations is raised alternately to give a beat note the pitch of which is determined by comparison with a fork. Intermediate frequencies are found by interpolation on the calibration curve. For the measurement of acoustic frequencies the sounds are converted into alternating currents by a suitable transmitter.

Geological Society, April 20.—Mr. R. D. Oldham, president, in the chair.—J. A. Douglas: Geological sections through the Andes of Peru and Bolivia. III.: From Callao to the River Perene. The zone of Mesozoic rocks extends to the Pacific coast, which is here formed of shallow-water deposits of Lower Cretaceous age. The granodioritic batholite which forms the core of the Andes is encountered in the neighbourhood of Lima, and again near the summit of the range. The western flanks of the Cordillera are characterised by a great development of Cretaceous porphyritic agglomerate; while the normal calcareous facies is the dominant feature of the high-level regions. The intensity of the Tertiary folding has obscured the effects of the post-Jurassic uplift previously shown to occur in the south, and it is only on palæontological evidence that a break in the sequence of Mesozoic deposits can be determined. The rocks of Palæozoic aspect which form the eastern

flanks of the Cordillera are mostly unfossiliferous, and have largely been converted into phyllites and mica-schists, penetrated by granite. On the Rio Perene a bigger mass of red granite is found, which is essentially a rock of "alkaline" character. It is suggested that its origin is antecedent to the uplift of the mountain ranges.—Prof. O. T. Jones: The Valentinian series. The history of the nomenclature from the time of Murchison onwards was traced and the relation of the Tarannon to the Llandoverly and the Birkhill-Gala rocks discussed in detail. In view of the occurrence of two distinct facies (graptolitic and shelly) of the Valentinian rocks, two separate classifications are in use. The succession of graptolites is made the basis of one of these, the series being divided into a Lower or Birkhill stage and an Upper or Gala stage, each of which is further divided into sub-stages and zones. The mixed facies of Girvan allows certain shelly horizons to be brought into relation with the graptolitic scale. The fauna of various districts where the shelly facies prevails is compared with the Girvan succession and a general correlation-table of the Valentinian rocks proposed, the rocks of the shelly facies being divided into two stages—Lower and Upper Llandoverly. The base-line of the Valentinian series was discussed, and in most districts evidence is found of an abrupt lithological change at a certain horizon, which in some cases amounts to a palæontological break. The phenomena at that horizon suggest arrested sedimentation, if not also actual erosion.

PARIS.

Academy of Sciences, April 18.—M. Georges Lemoine in the chair.—J. Boussinesq: The flattening along the polar axis, by surface tension, of a liquid drop, of revolution and without weight, possessing a given angular velocity ω of rotation round this axis.—E. Bourquelot and M. Bridel: The application of the biochemical method of research on glucose to the study of the products of fermentation hydrolysis of inulin. By the hydrolysis of inulin by the inulase from *Aspergillus niger* reducing products are obtained which possess the rotary power of *d*-fructose, and do not combine with methyl alcohol under the influence of emulsin. It is concluded that the hydrolytic fermentation of inulin gives no glucose.—L. Cuénot: Regeneration of claws in the place of antennæ removed by cutting in a Phasmid.—B. Gambier: Non-unicursal algebraic curves with constant torsion.—L. Montangerand: Observation of the eclipse of the sun on April 7, made at Toulouse Observatory.—A. Véronnet: The constitution and formation of the spiral nebulae. A mathematical investigation of the conditions under which a double star formed of two components of large, homogeneous, and approximately equal masses may lead to the formation of a spiral nebula.—H. Chipart: The homologues of a permanent uniformly magnetised magnet. The law of the ellipsoid.—L. and E. Bloch: The spark spectra of gold and platinum in the extreme ultra-violet. Tables of wave-lengths of the lines of the spark spectra of these two metals are given between the limits 1843 and 1402.—A. Portevin: The use of very slow cooling for the micrographical study of alloys and the structure of the tungsten steels. The advantages of the very slow cooling are that the structure of the alloys appears on a larger scale, permitting projection on the screen with relatively low magnification, and sometimes new, unsuspected equilibrium structures are shown. The case of tungsten steels is considered in detail, and two photomicrographs of these alloys are reproduced.—M. François: A microscopic arrangement for the examination of opaque crystals.—G. Dubreuil: The principle of a new method of graphical

stereoscopic reconstruction of magnified microscopic objects.—A. **Duboin**: The constitution of smalt. Details for the preparation of this colouring matter are given, the analysis of which leads to the formula $K_2O \cdot CoO \cdot 3SiO_2$ as representing its composition.—G. **Claude**: The manufacture of hydrogen for the synthesis of ammonia. With a view to the utilisation of hydrogen from water-gas, experiments on the solubilities of hydrogen and carbon monoxide in various solvents at high pressures (up to 1600 atmospheres) and at varying temperatures were carried out. A diagram is shown giving the results of the solubility experiments for hydrogen and carbon monoxide at $20^\circ C.$ and $-40^\circ C.$ in ether. It is concluded that by using ether the commercial separation of these two gases under pressures of about 100 atmospheres and temperatures of the order of $-50^\circ C.$ would easily give hydrogen containing less than 0.2 per cent. of carbon monoxide.—M. **Vèzes**: The composition of French turpentine. The proportions of pinene and nopinene are determined by a polarimetric method.—L. **Palfray**: The cresyl cyanocampholates and their reduction product.—R. **Cornubert**: The oxidation with permanganate of $\alpha\alpha$ -methylallylcyclohexanone in alkaline solution.—E. **André**: The determination of the acetyl figure of fatty materials. A simplification of the Lewkowitsch method.—L. **Cayeux**: The existence of numerous halcyon spicules in the Jurassic iron minerals of France.—P. **Russo**: The geological situation of the volcanoes of Oudjda, eastern Morocco.—M. de **Monfessus de Ballore**: The longitudinal depression of Chile.—L. **Blaringhem**: The variations and fertility of the hybrid *Primula variabilis* compared with those of its parents, *P. vulgaris* and *P. officinalis*.—P. **Dangeard, jun.**: The evolution of the aleurone grains in ordinary vacuoles and the formation of tannins.—L. **Destouches**: The prolongation of life in *Galleria mellonella*. At the most favourable temperature, $37^\circ C.$, the total evolution of the caterpillars of *Galleria* from the egg to the butterfly is about fourteen days. This period can be progressively lengthened by lowering the temperature. By submitting the caterpillars for periods of twenty-four hours alternately to temperatures of $1^\circ C.$ and $37^\circ C.$ the life can be prolonged to thirty-five days, and at the same time the production of eggs is more than doubled.—L. **MacAuliffe** and A. **Marie**: An anatomo-physiological study of a Japanese method of abdominal massage.—A. **Peyron**: The mode of development and the varieties of tumours of the ovotestis.—J. **Legendre**: The biology of the Madagascan perch.

ROME.

Reale Accademia nazionale dei Lincei, February 20.—Original papers by fellows:—G. **Castelnuovo**: Abelian functions, ii.: The geometry of Abelian varieties.—C. **De Stefani**: Ligurian siliceous sponges, iv.: Eocene, lower strata, valley of the Iso and Cairo (Italy).—A. **Issel**: First steps in the systematic arrangement of geological marks. The author proposes to divide them into nine classes, namely, cosmic marks (meteorites), atmospheric marks, hydrospheric marks, hydro-mineral marks, volcanic marks, tectonic marks, plutonic marks, glacial marks, and physiological marks.—Papers communicated through fellows:—L. **Tonelli**: Two propositions of Lindeberg and Levi in the calculus of variations, ii.—O. **Lazarino**: Variations in kinetic energy of a semi-rigid rotating system.—M. **Pascal**: Superficial circulation, ii. Vectorial expressions and general theorems analogous to ordinary circulation theories.—C. **Perrier**: The true nature of Rosasite. This mineral, discovered in a mine at Rosas, in Sardinia, in the form of crystals, is mainly compounded of copper

oxide, copper carbonate, and zinc carbonate.—E. **Bora**: Contributions to the natural history of Anopheles and their extermination (in connection with Prof. B. Grassi's anti-malaria campaign at Fiumicino, near Rome), iii. The author gives statistics regarding the hours of the day and night at which the mosquitoes enter buildings and commence their attacks. It appears that they rarely attack until some time after their entry. In a second part of the note the author gives evidence in support of the view that fishes and ducks are inefficacious in attacking and keeping down the larvæ.—A. **Lo Surdo**: Binaural localisation of pure sounds. In order to test the theory according to which perception of the direction of a source of sound is due to the difference of phases of the waves as they reach the two ears, the author has constructed an experimental apparatus in which a source of sound is connected with the ears by two tubes, one of which at least can be varied so as to be made longer or shorter than the other at will. If the difference of path is less than half a wave-length, the sound appears to come from a source in the direction of the shorter path; if the difference is exactly equal to a wave-length, the source appears to be in front, and, as should be expected from theory, the apparent direction of the source now varies when one path is increased or decreased in just the same way as it would vary if we started with the two paths equal.—The Secretary (Prof. Castelnuovo) announced that ten candidates submitted works in competition for the prize for physical and chemical sciences offered by the Minister of Public Instruction, and one candidate for the Carpi prize.

Books Received.

The Man who Did the Right Thing: A Romance of East Africa. By Sir Harry Johnston. Pp. vii+444. (London: Chatto and Windus.) 8s. 6d. net.

The Elements of Illuminating Engineering. By A. P. Trotter. (Technical Primers.) Pp. xi+103. (London: Sir I. Pitman and Sons, Ltd.) 2s. 6d. net.

Cours de Physique générale. By Prof. H. Ollivier. Tome premier. Deuxième édition. Pp. 749+iii planche. (Paris: J. Hermann.) 45 francs net.

The New Philosophy of Modern Science. By Dr. W. W. Strong. Pp. viii+194. (York, Pa.: Kyle Printing Co.)

Hiroshige. By Yone Nogouchi. Pp. ix+38+xix plates. (New York: Orientalia; London: Elkin Mathews.) 25s. net.

The Electrical Transmission of Photographs. By Marcus J. Martin. Pp. xi+136. (London: Sir I. Pitman and Sons, Ltd.) 6s. net.

The Extra Pharmacopœia of Martindale and Westcott. Revised by Dr. W. Harrison Martindale and W. Wynn Westcott. Seventeenth edition. Vol. ii. Pp. xxxii+688. (London: H. K. Lewis and Co., Ltd.) 17s. 6d. net.

Laboratories: Their Planning and Fittings. By Alan E. Munby. Pp. xix+220. (London: G. Bell and Sons, Ltd.) 25s. net.

A New British Flora: British Wild Flowers in their Natural Haunts. Described by A. R. Horwood. Vol. v. Pp. xi+234+1-lxiv plates. Vol. vi. Pp. xix+232. (London: Gresham Publishing Co., Ltd.) 12s. 6d. net each vol.

Storia della Geometria descrittiva dalle Origini sino ai Giorni Nostri. By Prof. Gino Loria. (Manuali Hoepli.) Pp. xxiv+584. (Milano: U. Hoepli.) 25 lire.

Famous Chemists: The Men and their Work. By