

Societies and Academies.

LONDON.

Royal Society, Jan. 31.—S. Chapman: On the theory of the solar diurnal variation of the earth's magnetism. A 'drift-current' theory is proposed, which may account for the major part of the solar diurnal magnetic variation, but at present a decision cannot be made between this and the 'dynamo' theory; both theories require that the diurnal convective motion in the conducting layer differs largely in phase from that observed in the lower atmosphere.—G. M. B. Dobson, D. N. Harrison, and J. Lawrence: Measurements of the amount of ozone in the earth's atmosphere and its relation to other geophysical conditions. Daily observations of ozone in the upper atmosphere show that there is a well-marked area, with much ozone, immediately to the west of cyclones, while ozone is generally small in anti-cyclones. Polar air currents in upper atmosphere are generally associated with much ozone and equatorial currents with little. There is large annual variation in amount of ozone in high latitudes, but very little in low. In autumn the amount of ozone is nearly uniform over the hemisphere.—S. Chapman and J. M. Stagg: On the variability of the quiet-day diurnal magnetic variation at Eskdalemuir and Greenwich. Corresponding daily values of percentage departure of actual from the 'normal' range of diurnal solar magnetic variation (ΔR) for the same element at the observatories are closely correlated, whereas there is much less correlation between corresponding values of ΔR for different elements at the same observatory. Actual range (R) or ΔR sufficiently characterises daily variation at any season, because variation is the same, except in scale, on days of large as on days of small range.—L. H. Gray: The absorption of penetrating radiation. Adopting the hypothesis that penetrating radiation is a type of γ -radiation, its absorption in the atmosphere is investigated from the theoretical point of view.—R. d'E. Atkinson: The probability of excitation by electron impact. Starting from the quantum theory point of view, a method is developed of analysing the results obtained by the Townsend type of experiment, in which currents of the form $i = i_0 e^{ax}$ are found on varying the distance x between two parallel plates in a gas at comparatively high pressures.—N. W. McLachlan: Pressure distribution in a fluid due to the axial vibration of a rigid disc. Pressure distribution throughout the hemisphere on each side of a rigid disc, vibrating in a circular aperture in a plane wall of infinite extent, is considered. When wave-length is large compared with diameter of disc, pressure distribution is uniform over any hemispherical surface distant several diameters from disc. When wave-length is comparable with diameter, pressure decreases with increase in angular distance from axis. In general, the central zone is the only one of importance.—J. D. Cockcroft: Skin effect in rectangular conductors at high frequencies. At high frequencies the surface of the conductor becomes a stream-line in the magnetic field, and the problem of distribution of current becomes analogous to an electrostatic problem, surface current density corresponding to electrostatic surface density, whilst depth of penetration is the same as for infinite strips.—L. Rosenhead: Systems of line vortices in a channel of finite breadth. The investigations deal with a Kármán street of vortices, or unsymmetrical double row, in a channel of finite breadth. A discussion on the symmetrical double row has also been incorporated.—T. P. Hilditch and N. L. Vidyarthi: (1) The products of partial hydrogenation of some higher monoethylenic esters. A method has been worked out of determining the constitution of the isomeric acids produced in hydro-

genation of derivatives of the oleic series. Methyl esters of oleic, palmitoleic and erucic acids each yield a mixture of three position-isomerides, namely, the original acid, and the two acids in which an ethylenic linkage is in either of the positions adjacent to that originally occupied. The bearing of this upon the general theory of contact action at solid surfaces is considered; the opposite geometrical isomeride of original ethenoid acid, and also formation of position isomers, seem to be due to dehydrogenation of freshly formed saturated ester prior to desorption from catalyst.—(2) The products of partial hydrogenation of some higher polyethylenic esters. The various ethenoid bonds are not usually hydrogenated at same rate, and the isomerisation phenomena discussed above are encountered. These complications are not sufficient seriously to interfere with the utility of the method as a means of determining constitution of polyethylenic derivatives.—P. K. Kichlu and D. P. Acharya: Infra-red radiations of active nitrogen. Photographic investigation of the spectrum from $\lambda 7500$ to $\lambda 8900$ shows that it is an extension of the first positive group of nitrogen in the green, yellow, and red regions. The most important group of lines of atomic nitrogen at about $\lambda 8200$ is absent.—T. H. Havelock: The vertical force on a cylinder in a uniform stream. The method of successive images, taking images alternately in surface of cylinder and in free surface of stream, is used. The method can be applied to any submerged body for which image systems are known.—R. C. J. Howland: Stress systems in an infinite strip.—A. H. Wilson: Perturbation theory in quantum mechanics. The convergence of the series of perturbations is discussed. Though the series is not in general convergent, yet it usually possesses an asymptotic character, and its use is therefore justified.—O. W. Richardson and K. Das: The spectrum of H_2 : the bands analogous to the orthohelium line spectrum.—O. W. Richardson and P. M. Davidson: The singlet bands of the hydrogen molecule (1). The strongest two band systems in the spectrum of H_2 belong to 3 to 2 electron transitions analogous to those of the parhelium line spectrum. The properties of the final state are given with great accuracy.

Linnean Society, Jan. 3.—C. E. Moss: A new genus of the Hydrocharitaceæ from the Zambezi. The freshwater plant discussed was collected in the River Zambezi, at its confluence with the River Linyanti, at Kazangula, above Livingstone, in Rhodesia. It was growing, staminate plants here and pistillate plants there, on the water-margin of a reed swamp, in water about three metres deep. Apart from the flowers, the whole plant was submerged. The petals are broad; the stamens number twelve, and are of four different sizes; six staminodes, three large filament-like ones and three small scale-like ones, occur in the pistillate flower. Moreover, the new plant is remarkable by its elongate and ligulate leaves, its elongate and terete peduncles, and its cylindrical and monophyllous spathes all covered with soft conical projections. The plants appear to be identical with the type-specimen of *Boottia muricata* Wright.

PARIS.

Academy of Sciences, Jan. 7.—A. Lacroix: The existence of tectites at Cambodia: their morphology. A résumé of the results of the examination of 1750 specimens, giving an account of the shape, fracture, and markings. The question of origin is reserved for later discussion.—E. Fichot: The extension of the method of geographical engineers to terms of the fourth order.—A. Stodola was elected *correspondant* for the Section of Mechanics, and William Bowie *correspondant* for the Section of Geography and

Navigation.—Paul Delens : Spherical operations and paratactic congruence.—Ch. Bioche : Ruled surfaces having skew cubics for asymptotes.—V. Smirnov : The limit values of analytical functions.—Soula : The comparison of various theorems on Taylor's series.—O. D. Kellogg and Florin Vasilescu : Contribution to the study of the capacity and of Wiener's series.—A. Demoulin : A class of congruences.—Jules Drach : The transformation of partial differential equations of the second order by the explicit use of the characteristic variables of Ampère.—Arnaud Denjoy : A class of analytical functions.—Alexandre Kovanko : The approximation of generalised nearly periodic functions.—A. Gay : The slow, non-permanent movement of any cylinder in a viscous incompressible liquid.—Ernest Esclangon : Experiments in optical reflection and the asymmetry of space.—Ludovic Gaurier : Limnological studies in the French Pyrenees.—Th. De Donder : The photonic field and the relativist generalisation of the undulatory mechanics of Dirac.—A. F. Joffé and A. N. Arsénieva : Experiments on the polarisation of electronic waves. The negative results from these experiments concerning polarisation either by reflection or by the magnetic field are in full agreement with the undulatory theory of matter developed by C. G. Darwin and by J. I. Frenkel.—J. Frenkel : The impossibility of polarising the cathode rays by reflection.—Henri Gutton : The properties of ionised gases in high frequency fields.—Jean Thibaud : The effect of periodic concentration and expansion produced by a longitudinal magnetic field on a bundle of slow electrons. The effects produced on the trajectory of a bundle of slow electrons passing through the magnetic field produced by a coil carrying a continuous current resemble those produced on a ray of light passing through a lens, the convergence of which varies continuously.—Léon and Eugène Bloch : Inter-combinations and new terms in the spark-spectrum of sulphur, S II.—J. Dufay : The absorption spectrum of oxygen and of ozone in the ultra-violet region.—V. Dolejšek and K. Pestrecov : The tendency of the values of the discontinuities of the K absorption of the simple bodies.—Henri Belliot : Influence of the nature of the fixer on the development after fixing of inverted or solarised photographic plates.—P. Dejean : The study of mechanical properties as a means of following the transformations of brasses containing 57.5-63.5 per cent of copper. Crushing tests at varying temperatures up to 900° C. have been carried out and the results given in a graph in which the crushing strength is plotted against temperature for several alloys. The curves show a point of inflection at 475° C. common to all the alloys, and a higher point, 685°-783° C., varying with the composition of the alloy.—Albert Roux and Jean Cournot : The internal transformations of a copper-aluminium alloy. Details of X-ray studies of a copper-aluminium alloy (90 copper, 10 aluminium) after various kinds of heat treatment.—Pierre Jolibois : The application of the theory of Smits to the allotropic varieties of phosphorus. The author contends that this theory, although attractive, is not in accord with the known facts concerning the allotropic varieties of phosphorus. It is regarded as proved that there are four varieties of solid phosphorus, namely, white phosphorus, ordinary red phosphorus, pyromorphic phosphorus and Bridgmann's black phosphorus.—Clément Duval : A cobaltic monamine. Werner has classified the cobaltamines in seven series containing decreasing quantities of ammonia. Up to the present, no example has been known of the type $(Co \cdot NH_3 \cdot X_5) \cdot M_2$. The preparation of a representative of this series is described, sodium cobalti-ammonio-borate

$(Co(BO_2)_5NH_3)Na_2$.—R. Locquin and V. Cerchez : Some derivatives of hydantoinacetic acid.—Max and Michel Polonovski : 3-Chlorotropane and the non-existence of Hesse's bellatropine.—J. Orcel and Gil Rivera : The microscopic study of the complex copper-silver minerals of Colquijirca (Peru).—Robert Gibrat : The variation with direction of the capillary constant of smectic bodies. An application of the Gauss theory of capillarity to smectic bodies.—Maurice Blumenthal : The succession and distribution of the tectonic units of the Mediterranean slope of the Betic Cordilleras between Grenada and Gibraltar.—G. Nicolas : An endophyte of *Lumularia cruciata*.—N. N. Kourtiakoff : The influence of the relief of the soil on fertility.—P. Mazé and P. Evens : Chlorosis in cultures on land under sewage irrigation : its cause and cure. This can be remedied by addition of iron salts.—Harald Okkels : The existence of a morphological specialisation at the level of the vascular pole of the renal glomerule in the frog.—J. André Thomas : The reactions of grouped living beings. The action of some alkaloids on *Convolvula Roscoffensis*.—F. Holweck : The production of monochromatic X-rays of great wave-length. Quantitative action on micro-organisms. Study of the action of X-rays of 4-8 Å. on the pyocyanic bacillus. The results for rays of 4 Å. and 8 Å. are shown on separate curves and compared with the calculated curves.—A. Lacassagne : The action of X-rays of great wave-length on micro-organisms. The establishment of exact statistics of the mortality of the irradiated bacteria. A discussion of the technique necessary for exact determinations.—Mme. P. Curie : The study of the probability curves relating to the action of the X-rays on bacilli. A mathematical discussion of the matter in the two preceding papers.—S. Mutermilch and Mlle. E. Salamon : The local formation of antitoxins in the cephalo-rachidian fluid. The vasculo-meningeal barrier is impermeable to blood antitoxins formed in the animal organism as the result of the inoculation of anatoxins in the peritoneal cavity. The appearance of antitoxins in the cephalo-rachidian fluid of animals vaccinated by the intra-meningeal method is due to their local production by cells the nature of which has still to be ascertained.—Georges Tixier : The spectrographic verification of the activation of ergosterol under the influence of irradiation by ultra-violet rays. The curve of transmission of the ultra-violet rays and the curve of antirachitic activity, considered as a function of the time of irradiation, are parallel at first, and then deviate from each other as the time increases. The maximum of antirachitic activity does not correspond with the minimum transparency.

LENINGRAD.

Academy of Sciences (*Comptes rendus*, No. 23).—A. A. Belopolskij : Changes in the spectrum of the star α^2 in the constellation Canes Venatici. Observations of variations in the intensity of certain lines in the spectrum.—N. Gajevskaja : Some new pelagic infusoria from Lake Baikal. Descriptions of three new genera and four new species.—C. Flerov : The diagnostic characters in the genus *Capreolus* Frisch (fam. Cervidæ). Revised diagnoses of the genus and of its two species, *Capreolus capreolus* (Linn.) and *C. pygargus* (Pallas), the latter with three subspecies.—J. Gueronimus : The multiple polynome deviating least from the zero and with two first coefficients given.—B. Schtylko : A method of determination of fossil remains of Teleostei. In many cases it is possible to use for the identification of fragmentary fossils of Teleostei the shape and sculpture of scales ; several examples are analysed.