

## Birthdays and Research Centres.

June 7, 1877.—Prof. C. G. BARKLA, F.R.S., professor of natural philosophy in the University of Edinburgh.

The *J*-phenomenon still engages our attention on account of its seemingly fundamental nature. Experimental results 'cut right across' current theory and indicate that some properties of radiation (at least) are controlled not by independent constituent wave-trains or quanta but by a quality of the whole stream of radiation more closely allied to temperature. Some elusive condition is, however, essential to the occurrence of the *J*-discontinuities—a condition found to be independent of the nature and disposition of apparatus so far as these are externally observable. Recent experiments with Mr. Honeyman show the rapid development of the characteristic discontinuities with the time of exposure of the radiating substance to X-rays; while experiments with Mr. Kay confirm and extend this conclusion by showing that two different specimens of one kind of radiating substance behave differently at the same time, one providing discontinuities, the other not. Our immediate problem is to discover the nature of this critical state of the radiating substance.

June 11, 1867.—Prof. CH. FABRY, professor of physics in the University of Paris.

Nous connaissons assez bien la partie basse de notre atmosphère, celle qui nous est directement accessible. Mais au-dessus, entre la basse atmosphère et les espaces cosmiques, s'étend une région étendue, qui fait encore partie de la terre puisqu'elle gravite avec elle, et dont l'étude est très difficile. Cette étude est cependant fort importante; ce sont ces hautes couches de notre atmosphère qui reçoivent tous les chocs venant de l'extérieur: Étoiles filantes et bolides, corpuscules électriques (rayons cathodiques et rayons positifs), radiations de toutes longueurs d'onde. Ce que l'on sait sur ces hautes couches a été trouvé un peu par hasard; c'est ainsi que l'étude pratiquée des communications par radio a fait connaître l'existence de hautes couches renfermant un nombre important de charges électriques.

L'étude de l'absorption des radiations venant des astres, en particulier du soleil, dans leur passage à travers notre atmosphère, a révélé aussi des choses très inattendues. Il y a, dans la partie haute de notre atmosphère, une certaine quantité d'ozone, qui absorbe une grande partie des radiations ultra-violettes venant du soleil. Des résultats fort importants ont déjà été obtenus, en particulier par Dobson et ses collaborateurs; l'étude demande à être poursuivie. Des recherches récentes (Buisson, Ladenburg et Götz) ont confirmé que la basse atmosphère contient un peu d'ozone; il faut en tenir compte dans les études sur l'absorption. L'altitude de la principale couche d'ozone de la haute atmosphère a été, jusqu'ici, évaluée à 50 km. environ; si l'on tient compte de l'ozone de la basse atmosphère, on sera probablement amené à placer encore plus haut l'ozone de la haute atmosphère, peut-être à 80-100 km. (Chalonge). Cet ozone est peut-être en relation avec la couche ionisée que révèlent les observations sur la radio.

Les expériences récentes poursuivies dans divers pays sur les *fusées* donnent l'espoir que l'on pourra un jour envoyer des instruments dans ces très hautes régions.

## Societies and Academies.

LONDON.

Royal Meteorological Society, May 20.—Sir Gilbert Walker: Recent work by S. Mal on the forms of stratified clouds. Two years ago it had been suggested that the breaking up of a stratum of cloud into polygons or long strips was often due to instability, accompanied in the latter case by shear parallel to the strips. Mal showed that a rectangular pattern was caused when the unstable stratum was subjected to a less rapid shear than is needed for strips; and verified from measurements made in the sky that cloud strata break up or persist according as their temperature gradient is unstable or stable; and that when they break up the pattern assumed is polygonal, rectangular, or in strips according as the shear is zero, moderate, or large.—C. K. M. Douglas: A problem of the general circulation. So far as can be judged from present data, there is no appreciable net flow of polar air in the lower troposphere towards the subtropical anticyclone. This supports the view of Dr. Jeffreys, namely, that the exchange of air between different latitudes, required to maintain the angular momentum of the zone of west winds against friction, is carried out entirely by currents lying side by side, and not one above the other. The fundamental problem is the relation of the individual cyclone to the general circulation, and this has not yet been solved.—G. S. P. Heywood: Wind structure near the ground, and its relation to temperature gradient. The wind velocities were obtained by two anemometers at heights of 12.7 m. and 94.5 m. above the ground. There are not many results from anemometers so high as 95 m.; for this reason, the ordinary diurnal variation at this height in summer and winter is shown, with that at 13 m. for comparison. The vertical gradient of temperature up to 87 m. is also recorded. Wind gradient must depend largely on temperature gradient, and the relation between the difference in wind velocity and the difference in temperature over approximately the same height interval, is worked out for various wind strengths.

PARIS.

Academy of Sciences, April 20.—The president announced the death of René Kœhler, *Correspondant* for the section of anatomy and zoology.—M. Delépine: Notice on Raffaello Nasini.—L. Joubin: Notice on René Kœhler.—Lucien Daniel: The persistence and accentuation of variations in the descendants of the Jerusalem artichoke grafted on the sunflower. In agreement with the hypotheses of Lamarck and Darwin, it has been proved by a series of experiments started in 1894 that grafting in the Jerusalem artichoke and its descendants is a powerful factor of variation, the action of which persists and is sometimes accentuated in the successive generations of this species.—W. Tartakowsky: The representation of a system of numbers by a system of positive additive quadratic forms.—S. Carrus: The integration, without the sign of quadrature, of certain systems of differential equations with any coefficients.—Mlle. Marie Charpentier: Semi-closed ensembles and their applications in the theory of Peano points.—E. Kogbetliantz: Jacobi developments.—N. Abramesco: The movement of a variable plane figure with conservation of similitude.—Alfred Rosenblatt: The plane movements of viscous liquids adjoining radial movements.—Paul Woog, Mlle. Emilie Ganster, and Jean Givaudon: The stabilisation of oils for chronometry. Fatty oils as lubricants for clocks and watches have advantages over mineral oils, but have the dis-



advantage that the viscosity changes owing to oxidation. Experiments on various anti-oxygens, based on the work of Moureu and Dufraisse, have led the authors to propose a mixture of  $\beta$ -naphthol and a red dyestuff to be added to the oil. The former prevents oxidation, and the dye by absorbing the actinic rays hinders oxidation due to exposure to daylight.—**G. A. Mokrzycki**: Determination of the combustible necessary to reach the practical plafond.—**G. Reboul**: Singularities presented by bodies submitted to the action of resistance cells.—**Th. V. Ionescu**: Ionised gases and Coulomb's law. The existence of a vibration period for ionised gases makes possible the calculation of the velocity of propagation of an electric wave in these media.—**Mlle. Paule Collet** and **G. Foëx**: The magnetic states of platinum.—**V. Lalan**: The hypothesis of the curve of pursuit and refraction in optical systems in motion.—**H. Hulubei** and **Mlle. Y. Cauchois**: A simple and luminous arrangement for the study of the Raman effect.—**Jean Becquerel** and **Louis Matout**: A new magneto-optical effect: rotatory power along the optical axis of certain uniaxial crystals in the neighbourhood of absorption bands under the action of a magnetic field normal to this axis.—**S. Rosenblum** and **M. Valladares**: Figures of distribution of the active deposit on electrodes.—**Georges Fournier**: The existence of different isotopes. A list is given of probable isotopes not, so far, found experimentally.—**René Pallu**: The decomposition of monobarium phosphate in solution.—**Georges Arditti**: The oxidation of paraffin oil by air. For the detection of the first traces of acid formed by the oxidation, use is made of Dubrisay's method of the change in the interfacial tension between the oil and a solution of caustic soda. At temperatures of 15° C. and 85° C. there is no oxidation, but traces of acid appear at 110° C.—**P. Bary** and **E. Fleurent**: The law of degradation of solutions of rubber as a function of the time at different temperatures.—**P. Laffitte** and **M. Patry**: The transmission of a detonation at a distance.—**M. Paic**: The double compounds between the mercuric sulphates and mercuric iodide.—**J. Bougault** and **G. Schuster**: A new triglyceride obtained from cocoa butter. A palmitostearoazelain.—**M. Tiffeneau**, **Mlle. Jeanne Lévy**, and **E. Ditz**: Two diastereoisomeric derivatives of campholenic acid: their formation in unequal but inverse proportions by inverting the order of introduction of the fixed radicals.—**R. Cornubert**: An attempt at the reproduction of a tetrahydropyrone compound.—**Charles Dufraisse** and **Roger Netter**: Researches on the ethylenic ketones:  $\alpha$ -bromo- $\beta$ -aminobenzalacetophenones.—**Marcel Godchot** and **Mlle. Germaine Cauquil**: Some new derivatives of the cyclo-octane series. A new cyclo-octene oxide is described, as well as the glycol obtained by its hydration.—**R. Paul**: The action of magnesium on some halogen substituted ether oxides. The reaction between magnesium and oxides of the type  $RO(CH_2)_3X$  ( $X = I, Br, \text{ or } Cl$ ) has been studied. The reaction is influenced both by the catalyst added and by the nature of the solvent.—**Paul Gaubert**: The artificial coloration of crystals of oxalate and nitrate of urea. A study of the influence of various colouring matters on the crystalline forms of urea oxalate and urea nitrate.—**F. Zambonini** and **V. Caglioti**: New researches on the chemical composition of sarcolite from Mont Somma (Vesuvius). Five complete analyses are given: these are not in agreement with the formula proposed by Gossner and Mussgnug.—**Yang Kieh**: The dislocated zone situated to the north of the Chaîne de la Marche.—**V. Frolow**: The periodicities of the risings of the Niger at Koulikoro. The results of the study by the method

of A. Wallen of 24 years' data.—**R. Bureau**: The variations of wireless atmospherics during the eclipse of the moon of April 2, 1931. The curves of the records of atmospherics recorded at Saint-Cyr and at Mont Valérien show a marked anomaly between 18 h. and 24 h. on April 2, 1931. Hence there is a connexion between the eclipse of the moon and atmospherics.—**Jean Chevrier**: Magnetic exploration in Syria.—**P. L. Mercanton**: The inversion of the magnetic inclination in geological time. New observations. In an earlier communication, a study of the natural magnetisation of volcanic lavas of various origins (Greenland, Spitsbergen, Australia) led to the conclusion that at the Tertiary epoch, at the time of the great volcanic outbursts, the terrestrial magnetic inclination was, in both hemispheres, the reverse of what it is to-day. Further experimental data in support of this view are now given.—**F. Labrousse**: The changes in reaction observed in the course of the development of some fungi. The influence of the nature of the nitrogenous food material.—**E. Wollman** and **V. Uribe**: Researches on humoral immunity in cold-blooded animals.—**Maurice Nicloux**: The micro-estimation of organic substances in dilute solutions by sulphochromic oxidation. Special application to the micro-estimation of ethyl alcohol.—**Delherm** and **Laquerrière**: A new apparatus for faradic currents.

## ROME.

Royal National Academy of the Lincei, Nov. 2.—**F. Vercelli**: Complementary observations to the note on a general method for the analysis of the periodicity in statistical and experimental diagrams.—**C. Carathéodory**: Canonical transformations of slipping and their application to geometrical optics.—**R. Nasini**: Discovery of boric acid in the glaze of the vases of Arezzo. The glaze of these vessels, which constitute one of the finest examples of the Roman art of the first century B.C. and the first A.D., contains boric acid, not in accidental traces, but as a definite component (see NATURE, Dec. 6, p. 877).—**S. Amante**: Matrices which satisfy a given algebraic equation.—**B. de Finetti**: Determinate and indeterminate problems in the calculus of probabilities.—**Maria Pastori**: Isotropic tensors: relation between the components.—**Margherita Piazzolla-Beloch**: Connected oblique multilaterals.—**E. Čech**: A demonstration of Jordan's theorem.—**A. Kolmogoroff**: The conception of the mean.—**Nikola Obrechhoff**: A generalisation of Cesàro's summation.—**G. Rabaté**: Some points of direct infinitesimal geometry. Investigations on the notions of contingent and paratingent used by G. Bouligand as instruments of his direct infinitesimal geometry are summarised.—**E. Gugino**: The extension of Morera's theorem to the motion of systems with reversible linkings.—**L. Poggi**: Extension of D'Alembert's paradox and of the Kutta-Joukowski theorem to circular-arc profiles.—**E. Pistolesi**: The dynamic actions of a circulatory current on cusped profiles.—**A. Signorini**: The mechanics of continuous systems. In dealing with any problem of finite deformations, it is convenient, in the first place, to subject the general equations of the mechanics of continuous systems to a transformation analogous to that which, in the particular case of hydrodynamics, leads from Euler's equations to those of Lagrange. A new Lagrangian form of the indefinite equations now given may be of use in the indirect solution of certain particular problems.—**Angelina Cabras**: The mechanics of rigid bodies in generalised spaces. A scheme of procedure for applying the methods described in a preceding note to the static and dynamic treatments to all elliptical  $S_n$  is given.—**Enrico Volterra**: The general laws of the vibrations



of a network of stretched elastic wires with nodes in common and fixed or vibrating extremities are considered, the initial configuration of the system and the initial velocities of the elements of the elastic elements of the system being assumed known. The application of such laws to the study of water-hammer in a network of pipes under pressure is described.—R. Bilancini: The coefficient of correlation. An examination is made of the coefficient of correlation in the case when the relation between the two magnitudes considered is not linear, but when one of the magnitudes is expressible by means of a polynomial of the other of degree  $n$ , greater than one.—E. Fermi: Quantistic electrodynamics (2). The quantistic forms recently derived for the equations of a system composed of an electromagnetic field and of any number of point electric charges referred to the non-relativistic case, the velocity of the charges being not very high. These are now converted into the relativistic forms by a method other than that based on Dirac's theory of the rotating electron.—G. B. Pacella: Simple method for the calculation of an aspherical plano-convex lens. The form to be assigned to an aspherical lens with one plane face in order that it may be stigmatic for the point on the axis at infinity when a beam of monochromatic light falls on it, is determined.—A. Masotti: Calculation of the resultant and of the resultant moment of the electrostatic pressures in a plane field by formulæ analogous to the hydrodynamical formulæ of Blasius. The analogy between the electrostatic pressures exerted on the surface of an electrified conductor in equilibrium and the hydrodynamic pressures of a liquid in permanent, irrotational motion on the surface of an immersed solid, is developed. It is shown that, for an indefinite cylindrical conductor in an electric field with distribution uniform to infinity, the resultant of the electrostatic pressures on unit length of the conductor has the direction and sense of the electric force at infinity, while its magnitude is the product of such force by the charge of unit length of the conductor; the system of electrostatic pressures is equivalent to the resultant applied at the baricentre of the charges.—A. Corbellini and L. Barbaro: The anomalous decomposition of the tetrazo-derivative of 2'-diamino-1:1'-dinaphthyl. The acid melting at 250°-252°, previously observed as a product of this decomposition, is formed by partial decomposition of the tetrazo-compound when acid solutions of its sulphate or chloride are heated. This reaction proceeds also, although very slowly, at the ordinary temperature, and yields, in addition, neutral compounds difficult to purify.—Morello Morelli: Spectrochemistry of solutions of boric acid in glycerin. The molecular and specific refractivities of boric acid in glycerin solution are greater than in aqueous solution, and decrease as the concentration of the solution is increased. Dissolution of boric acid in glycerin is accompanied by expansion, the extent of which increases markedly with the concentration.—F. Rodolico: Polyhedral pisolites of magnesite and of dolomite.—G. Mezzadrolì and E. Varetton: Action of ultra-short electromagnetic waves ( $\lambda=2.3$  m.) on silkworms (3): Irradiation of the eggs. The favourable effect of the waves is increased if the exposure is commenced prior to hatching of the eggs.—M. Fedele: Innervation and peripheral sensitive arrangements of the arterial trunk of reptiles.—S. Ranzi: Conditions determining the development of gills (investigations on the experimental embryology of cephalopods).—M. Mitolo: Oxygen and central nervous functions. One of the mechanisms which explain the action of oxygen in the functions of the central nervous system and the indispensability of this gas

to the central nervous elements is the continuous oxidation of acids occurring among the metabolic products of this system.—Clara Forti: Excision of the vessels and nerves of the ovary; total or partial excision and metabolism (3). This excision produces slight retardation of the metabolism during the first few months after the operation.

### Official Publications Received.

#### BRITISH.

- Rhodesia Museum, Bulawayo. Twenty-ninth Annual Report, 1930. Pp. 12. (Bulawayo.)
- Proceedings of the Royal Society. Series A, Vol. 131, No. A817, May 1. Pp. 275-517. (London: Harrison and Sons, Ltd.) 12s.
- The Proceedings of the Physical Society. Vol. 43, Part 3, No. 238, May 1. Pp. viii+227-370. (London.) 7s. net.
- Amgueddfa Genedlaethol Cymru: National Museum of Wales. Welsh Timber Trees, Native and Introduced. By H. A. Hyde. Pp. viii+107+25 plates. (Cardiff.) 1s.
- Dominion of Canada. Report of the Department of Mines for the Fiscal Year ending March 31, 1930. (No. 2269.) Pp. v+61. (Ottawa: F. A. Acland.) 25 cents.
- Canada: Department of Mines: Geological Survey. Memoir 164: The Niagara Falls Survey of 1927. By W. H. Boyd. (No. 2246.) Pp. ii+15+5 plates. 10 cents. Summary Report, 1929, Part B. (No. 2255.) Pp. 202B. (Ottawa: F. A. Acland.)
- Canada: Department of Mines: Mines Branch. Investigations of Mineral Resources and the Mining Industry, 1929. (No. 719.) Pp. 69+5 plates. (Ottawa: F. A. Acland.)
- Publications of the Dominion Astrophysical Observatory. Vol. 4, No. 19: Four Spectroscopic Binary Orbits. By W. E. Harper. Pp. 309-323+1 plate. 25 cents. Vol. 4, No. 20: The Galactic Rotation Effect in some Late Type Stars. By R. O. Redman. Pp. 325-340. 25 cents. Vol. 4, No. 21: Y Cygni. By R. O. Redman. Pp. 341-350+1 plate. 25 cents. (Ottawa: F. A. Acland.)
- Trinidad and Tobago. Minutes and Proceedings of the Froghopper Investigation Committee. Part 20. Pp. 198-268. (Trinidad: Government Printing Office, Port-of-Spain.)
- Journal of the Royal Statistical Society. New Series, Vol. 94, Part 2. Pp. 171-358+xvi. (London.) 7s. 6d.
- The Transactions of the East Riding Antiquarian Society. Vol. 27, Part 1. Pp. iv+80+8 plates. (Hull: The Museum.) 10s. 6d.
- Imperial Bureau of Fruit Production. Horticultural Abstracts. Vol. 1, No. 1, March. Pp. 24. (East Malling.) 1s. 6d.
- Report of the National Park Committee. (Cmd. 3851.) Pp. 131. (London: H.M. Stationery Office.) 2s. net.
- Department of the Interior, Canada: Topographical Survey. Bulletin No. 63: The Aneroid Barometer and Altimeter, their Characteristics and Use in Mapping. By R. H. Field. With an Appendix: The Field Use of the Aneroid Barometer, by G. C. Cowper. Pp. 36. (Ottawa: F. A. Acland.) 10 cents.
- Air Ministry: Aeronautical Research Committee: Reports and Memoranda. No. 1363 (Ae. 491—T. 2977 and 'a'): Maximum Lift in Closed and Open Jet Tunnels. By F. B. Bradfield, K. W. Clark and R. A. Fairthorne. Pp. 19+5 plates. 1s. net. No. 1278 (Ae. 424—T. 2923 Spin 8): Spinning Experiments on a Single Seater Fighter. Part 1: Further Model Experiments, by A. S. Batson and H. B. Irving; Part 2: Full Scale Spinning Tests, by S. B. Gates. Pp. 10+12 plates. 9d. net. No. 1353 (Ae. 484—T. 2984): The Two-Dimensional Flow of Air around an Aerofoil of Symmetrical Section. By T. Tanner. Pp. 11+18 plates. 1s. net. No. 1356 (Ae. 487—T. 2969): Spinning of a Model of the Fairey IIIc Seaplane. By H. B. Irving and A. S. Batson. Pp. 15+27 plates. 1s. net. (London: H.M. Stationery Office.)

#### FOREIGN.

- Zoologica: Scientific Contributions of the New York Zoological Society. Vol. 9, No. 12: The Fur Seal of the California Islands, with new Descriptive and Historical Matter. By Charles Haskins Townsend. Pp. 443-457. (New York City.)
- Scientific Publications of the Cleveland Museum of Natural History. Vol. 1, No. 5: Bird Banding by Systematic Trapping. By S. Prentiss Baldwin. Pp. 125-168+plates 19-25. (Cleveland, Ohio.)
- Collection des travaux chimiques de Tchecoslovaquie. Redigée et publiée par E. Votoček et J. Heyrovský. Année 3, No. 4, Avril. Pp. 187-240. (Prague: Regia Societas Scientiarum Bohemica.)
- Publications of the United States Naval Observatory. Second Series, Vol. 13, Appendix 1: The Gravity Measuring Cruise of the U.S. Submarine S-21. By F. A. Vening Meinesz and F. E. Wright; with an Appendix on Computational Procedure, by Miss Eleanor A. Jamson. Pp. x+94+9 plates. (Washington, D.C.: Government Printing Office.)
- Det Kgl. Danske Videnskabernes Selskabs Skrifter: Naturvidenskabelig og matematisk Afdeling. 9 Række, IV, 1: Contributions to the Study of the Development and Larval Forms of Echinoderms, I-II. By Th. Mortensen. Pp. 39+7 plates. (København: Andr. Fred. Høst and Son.)
- Jahresbericht der Hamburger Sternwarte in Bergedorf für das Jahr 1930. Erstattet von dem Direktor, Dr. R. Schorr. Pp. 28+4 Tafeln. (Bergedorf.)
- Mitteilungen der Hamburger Sternwarte in Bergedorf. Band 6, Nr. 34: Sechster Nachtrag zum Eigenbewegungs-Lexikon. Zusammengestellt von W. Kruse und B. Ingart. Pp. 221-327. (Bergedorf.)
- Det Kgl. Danske Videnskabernes Selskab. Biologiske Meddelelser, Bind 10, Nr. 1: Der grosse europäisch-sibirische Kreuzschnabelzug 1927. Von Ad. S. Jensen. Pp. 27. (København: Andr. Fred. Høst and Son.) 1.00 kr.