Societies and Academies.

PARIS.

Academy of Sciences, Aug. 27.—**G. Bigourdan**: The co-ordinates of the observatory of the rue Sainte-Avoye. The position of Delambre's observatory and extracts from some of his notes.—**L. Joubin**: Various octopod cephalopods from the cruises of the *Dana* in the Atlantic. Amongst the specimens collected by Prof. J. Schmidt, of Copenhagen, were the octopods described. Their peculiarities necessitate a new classification of the lower octopods.—**L. Goldstein**: The equation of probability of wave mechanics.—**Paul Mondain-Monval**: The physical properties of heterogeneous ternary mixtures. The changes in the physical properties of a mixture of ethyl and isoamyl alcohols and water in the neighbourhood of the critical point, noted by P. Brun in a recent communication, were not confirmed: the curve representing refractive index as a function of concentration shows no discontinuity.—**J. Lacoste**: The daily variation of microseismic agitation.—**N. D. Costeanu** and **Al. Cocosinschi**: The rain of ashes of April 26, 1928, at Cernauti and its neighbourhood. An analysis is given of the powder which fell.

GENEVA.

Society of Physics and Natural History, June 21.—**Robert Chodat** and **Florencio Bustinza**: Pseudo-peroxidase, a new indirect ferment acting by means of hydrogen peroxide. From the results of their experiments the authors consider the pseudo-peroxidase extracted from the rhizome of *Cyperus esculentus* as a peroxidasic image of tyrosinase, just as the system peroxidase-peroxide is the image of laccase, which, like tyrosinase, is inhibited by hydrogen peroxide.—**Robert Chodat**: The phases of action of tyrosinase in the cresol blue reaction. The author and his pupils have shown that there are two phases in the action of tyrosinase on the complex *p*-cresol-aminoacid. In continuation of a work of M. Raper, according to which in the course of the oxidation a quinone is formed which is the cause of the removal of amino groups, R. Chodat has made fresh experiments which prove that only the quinone obtained by starting with *p*-cresol leads to this result.—**Alexandre Wissmer**: The trajectorial structure of the fœtal mandible in man. Up to the second month the mandible is represented by Meckel's cartilage, with a thin bony leaflet joined on. At the fourth month the existence of a fundamental trajectory is proved, which only serves as a support up to the time of birth.—**Swigel Posternak**: The limit of degradation of the lactobutyrins by trypsin. Some researches recently published by Rimington are in opposition to certain conclusions of the author: the latter has repeated his experiments on the products of the trypsin digestion of casein, and arrives at his original conclusions. He has isolated, besides the α, β, and γ lactotyrins already described, a polypeptide containing fourteen atoms of nitrogen to four atoms of phosphorus, and this represents the ultimate degradation product of the lactotyrins by trypsin. Amongst the products of hydrolysis, no oxyaminoacid is found other than serin.

WASHINGTON, D.C.

National Academy of Sciences (*Proc.*, Vol. 14, No. 7, July).—**O. G. Ricketson, Jr.**: A stratification of remains at an early Maya site. The Carnegie Institution expedition at Uaxactun, Guatemala, during the season 1928 investigated Stela 20 and an adjacent pyramid. The pyramid proved to be a secondary erection covering an earlier stepped pyramid resting on an early rubbish deposit. Stela 20 seems to have been placed in position resting on the same deposit by digging through two 'floors' laid down after the erection of the stepped pyramid. Stela 20 apparently dates from A.D. 235; the other remains are older, the stepped pyramid being the oldest Maya building known.—**Donald Statler Villars**: The degree of association of sodium vapour. Observations were made of the band spectra of a sodium-potassium alloy and the dissociation of the molecule, Na_2, calculated. Using the theoretical Sackur-Tetrode equation, the degree of association was estimated. Contrary to previous hypotheses, it was found that sodium vapour is mainly diatomic, especially at temperatures below 400° C.—**Erik G. Moberg**: The interrelation between diatoms, their chemical environment, and up-welling water in the sea, off the coast of southern California. The optimum position for diatoms in deep water during the summer of 1926 was 30-35 metres below the surface; above this level the limiting factor appeared to be lack of nitrate, whereas below it the illumination became insufficient. A certain amount of upwelling is required to maintain the environmental conditions.—**G. A. Miller**: Transformation of conjugate elements or of conjugate subgroups.—**Charles F. Craig**: Observations upon complement fixation in infections with *Endamœba histolytica*. Alcoholic extracts of cultures of this parasite, when used as antigens in a complement fixation test, appear to give a specific diagnosis of the presence of the organism. Positive reactions are given only by individuals suffering from *E. histolytica* and by healthy 'carriers.'—**Janet H. Clark**: Reversible crystallisation in tendons and its functional significance. A change of state, for example, from a liquid-liquid to a liquid-solid system, may cause changes in surface forces, which can be detected in X-ray diffraction patterns. The patterns obtained from white fibrous and yellow elastic tissue indicate that collagen and elastin exist normally as liquid crystals, but that the former undergoes reversible crystallisation on stretching the tendons. This probably increases cohesion and marks the limit of elasticity.—**G. W. Crile, Amy F. Rowland**, and **Maria Telkes**: An interpretation of excitation, exhaustion and death in terms of physical constants. Measurements of the potential difference (P.D.) between different organs and tissues in the rabbit show that physical injury, drugs, etc., cause an immediate fall in P.D., followed by some recovery; repeated or protracted excitation tends to diminish the P.D., and death occurs when the P.D. approaches zero. After death there is a secondary rise of P.D. in the brain and in voluntary muscle, but it eventually disappears, indicating complete death following clinical death.—**J. A. Bearden**: The polarisation of characteristic radiation. Monochromatic X-radiation was scattered from a graphite block at 45° to the beam, and the intensity of the scattered beam was measured parallel and at right angles to the beam. In one experiment the differences between the intensities when two different filters were used were compared; in another experiment the filters were replaced by a crystal of calcite and the graphite block rotated with the ionisation chamber. No certain evidence of polarisation was obtained.—**Carl Barus**: The repulsion between electric currents and their induced eddy currents in parallel. An attempt was made to measure the pressure on the mercury in one limb of the interferometer U-gauge due to eddy currents caused by an alternating current traversing a coil above the mercury. The results were not satisfactory.—**R. T. Cox, C. G. McIlwraith** and **B. Kurrelmeyer**: Apparent

evidence of polarisation in a beam of β-rays. β-rays were twice scattered at right angles from gold targets, and the number entering a Geiger counter were recorded as the angle between the initial and final segments of the path was varied. The essential parts are enclosed in an axial and radial channels in an upright steel cylinder, the top half of which, carrying the β-ray source and the first target, revolves about the bottom half. There is some evidence of true polarisation due to double scattering of asymmetrical electrons, which is confined mainly to the faster electrons.—**A. H. Compton**: The spectrum and state of polarisation of fluorescent X-rays. The line radiation in the spectrum of fluorescent X-rays from silver constitutes 99 per cent of the total radiation. The method is thus very useful for producing homogeneous X-rays; the β- and γ-rays can readily be filtered out, leaving practically nothing except $K\alpha$ radiation. The relative intensities and positions of the α- and β-lines is approximately the same in the fluorescent as in the primary X-rays, and the former are found to be completely unpolarised.—**G. Breit**: An interpretation of Dirac's theory of the electron. Certain terms of Dirac's theory are associated with definite physical quantities and its analogy with Pauli's formulation of the theory of the spinning electron is made more complete.—**R. C. Gibbs** and **H. E. White**: Regularities exhibited between certain multiplets for elements in the second long period. Plotting energy levels against atomic number for iso-electronic systems, lines connecting points for corresponding terms of each successive element are nearly straight lines; radiated frequencies resulting from transitions involving no change in total quantum number are displaced to higher frequencies by nearly a constant value. This applies in the first long period and is now extended to the second long period.—**Gaylord P. Harnwell**: Angular scattering of electrons in hydrogen and helium. A large scattering chamber was used with an electron gun which could be turned through nearly a complete circle. After passing through a slit in the closed end of a brass tube, the electrons were caught in a Faraday cylinder; a continuous flow method was used, the pressure in the cylinder being kept below that in the scattering chamber. With molecular hydrogen, atomic hydrogen, and with helium, a definite peak in the ionisation curve was observed as the electron gun was rotated. When, however, the inside of the chamber was given a heavy coating of magnesium, no peak appeared; the peaks therefore appear to be due to electrostatic charges inside the chamber. It is concluded that there are no favoured angles for electron scattering from these gases.—**Gilbert N. Lewis** and **Joseph E. Mayer**: Thermodynamics based on statistics. (1) It is assumed that for a system having a certain volume, energy, and number of particles, the whole field of specifications which describe the states of the individual particles is naturally partitioned into regions so as to give unique significance to a quantity, log Ω, where Ω represents the total number of different ways in which the particles may be distributed among the regions.—(2) The assumption made above leads to equations identical with those of classical thermodynamics.—**David M. Dennison**: A proposed experiment on the nature of light. Suppose a beam of high-frequency X-rays falls on a single crystal used as a diffraction grating, that the intensity of the beam is adjusted by filters so that only a few light quanta are transmitted per minute, and that Geiger counters are placed at the position of two Laue spots of equal intensity. On the classical wave theory, groups of waves will be diffracted simultaneously to all orders of reflection and the absorptions at the Geiger counters would be simultaneous; on the theory of light quanta, the absorptions would be related only by chance in such a manner that the mean energy arriving at each spot would be equal to that predicted by the wave theory.—**Egon Lorenz**: The spectrum of X-rays from the back of a tungsten target. Under the influence of the electric field, an electron beam hitting a target makes the latter a source of new electron rays ('reflected' rays), which hit the anode over its whole length; the total amount of such radiation is about 24 per cent of the focal spot radiation. With a tungsten anode it is produced mostly by secondary electrons knocked out from the levels of the tungsten atom, and the probability that absorption takes place is a function of the voltage applied to the tube.—**A. P. R. Wadlund**: Absolute X-ray wavelength measurements. A speculum grating with space $2{\cdot}0000 \times 10^{-3}$ cm. was used, and measurements were made at small glancing angles of the Ka_1 lines of copper, iron, and molybdenum.—**F. Zwicky**: On the thermodynamic equilibrium of the universe. Although the postulate is not justified so far as the distribution of radiation and the equilibrium between matter and radiation is concerned, a consistent statistical treatment of the equilibrium of different forms of matter on the basis of this postulate promises to furnish results agreeing with the facts.—**David White**: Algal deposits of Unkar Proterozoic age in the Grand Canyon, Arizona. Four forms of deposits, referred to blue-green algæ, and two or three doubtful of origin, are recognised.

Official Publications Received.

BRITISH.

First Report of the Joint Advisory Committee on River Pollution. Pp. 8. (London: H.M. Stationery Office.) 2*d*. net.

Imperial College of Science and Technology, South Kensington, London, S.W.7. Department of Aeronautics: Session 1928–29. Pp. 7. (London.)

Air Ministry. Aeronautical Research Committee: Reports and Memoranda. No. 1127 (Ae. 299): Further Development of Autogyro Theory. Parts 1 and 2. By C. N. H. Lock. (T. 2416 and a.) Pp. 43+2 plates. 1*s*. 9*d*. net. No. 1159 (Ae. 324): A Theoretical Estimate of the Pressure Gradient in a Wind Tunnel. By H. Glauert. (T. 2602.) Pp. 11. 6*d*. net. (London: H.M. Stationery Office.)

Australasian Antarctic Expedition, 1911–1914. Scientific Reports. Series C: Zoology and Botany. Vol. 8, Part 4: The Bryozoa. Supplementary Report. By Arthur A. Livingstone. Pp. 93+7 plates. (Sydney, N.S.W.: Alfred James Kent.) 10*s*.

Colony and Protectorate of Kenya. The Forest Department Annual Report, 1927. Pp. 35. (Nairobi.)

The East London College (University of London). Calendar, Session 1928–1929. Pp. 191. (London.) 1*s*.

Education, India. Education in India in 1925–26. Pp. iv+157. (Calcutta: Government of India Central Publication Branch.) 10 annas; 1*s*.

Transactions of the Royal Society of Edinburgh. Vol. 56, Part 1, No. 3: The Geology of the Highland Border from Tayside to Noranside. By Dr. Douglas A. Allan. Pp. 57-88+2 plates+1 map. (Edinburgh: Robert Grant and Son; London: Williams and Norgate, Ltd.) 5*s*. 6*d*.

Reports on the Organisation and Economic Aspects of Agricultural Research in various Countries. By Dr. Alexander Nelson. Pp. iii+116. (Hobart, Tasmania: Agricultural and Stock Department.)

Proceedings of the South London Entomological and Natural History Society, 1927–28. Pp. xx+125+8 plates. (London.) 12*s*. 6*d*.

Transactions of the Leicester Literary and Philosophical Society, together with the Council's Report and the Reports of the Sections, 1927–28. Vol. 29. Pp. 60. (Leicester.)

FOREIGN.

Cornell University: Agricultural Experiment Station. Memoir 110: The Effect of Freezing on the Respiration of the Apple. By D. B. Carrick. Pp. 28. Memoir 112: A Survey of Sickness in Rural Areas in Cortland County, New York. By Dwight Sanderson. Pp. 27. Memoir 113: Studies of Protein Metabolism, Mineral Metabolism and Digestibility with Clover and Timothy Rations. By L. A. Maynard, R. C. Miller and W. E. Krauss. Pp. 33. Bulletin 460: Bacteria Count Limits and the Transportation of Milk. By James D. Brew and Richard C. Fisher. Pp. 37. Bulletin 462: Economic Studies of Dairy Farming in New York. viii: Grade B Milk with Cash Crops and Mixed Hay Roughage, Crop Year 1924. By E. G. Misner. Pp. 38. Bulletin 464: An Economic Study of Certain Phases of Fruit Marketing in Western New York. By Roger B. Corbett. Pp. 51. (Ithaca, N.Y.)

United States Department of Agriculture. Technical Bulletin No. 52: A Classification of the Higher Groups and Genera of the Coccid Family Margarodidae. By Harold Morrison. Pp. 240+7 plates. (Washington, D.C.: Government Printing Office.) 50 cents.