

selves in this field. A notable contribution to knowledge of the subject has been published by the United States Office of Education in the form of a pamphlet (*Bulletin* No. 3 of 1932), entitled "Status of Teachers and Principals Employed in the Rural Schools". Within rather wide limits, school boards of most rural communities still hire whom they please, agree among themselves concerning professional standards, and bargain with the candidates for the lowest possible salary rates. It appears that the average annual stipend is 926 dollars. Nearly forty per cent of the entire number of teachers are employed in one-room schools. Nearly one-fourth of this group are twenty years of age or younger, and about four per cent are not more than eighteen. The most extreme status problem, the report says, is presented by the negro teachers of one-room schools, upwards of eighteen thousand in number, who receive, on an average, only 314 dollars a year, and have received an education equal to only about 2½ years above the elementary school standard.

Calendar of Geographical Exploration

Oct. 19, 1920.—Flora and Rivers of South-East Asia

F. Kingdon Ward reached the Tra-mu-tang and the marble gorge of the Salween, just above which the glacier-fed torrent from the Gomba La enters. The torrent was followed to the Salween-Irrawaddy divide. On this journey Kingdon Ward verified the conclusion that the Mekong-Salween divide up to the 28th parallel forms roughly the boundary between a Chinese flora to the east and an Indo-Malayan to the west. He also made some observations on the deglaciation and morphology of the region. Kingdon Ward has continued his explorations in the mountain masses of south-west China and its borders and has combined botanical work with geographical discovery.

Oct. 21, 1883.—Greely in the Arctic

Lieut. A. W. Greely and his party were obliged to winter at Cape Sabine, their third winter without supplies. A few depots were found which had been left by Sir George Nares and W. M. Beebe, but all stores were exhausted before the spring. When the sun reappeared in 1884, some of the party died of starvation and the relieving steamers did not reach Cape Sabine until June 22. Greely and his party were found almost at the point of death, but with their scientific instruments in order and with their great collections of specimens intact. Greely's party had been conveyed to Lady Franklin Bay in 1881 as the American contingent of the series of circumpolar stations arranged for at an international polar conference held in Hamburg in 1879. A relief ship should have reached the party in 1881, but failed to do so until 1884, with lamentable consequences for the unfortunate party, which in spite of great misery and suffering, heroically continued its scientific work during the whole of the period. Much geographical survey work was carried out, especially in Grinnell Land and along the north coast of Greenland.

Oct. 21, 1928.—The Alai-Pamir Expedition

The Alai-Pamir expedition returned to Osh, whence it had started on June 19. It was a joint expedition organised by the *Notgemeinschaft der Deutschen Wissenschaft* in Berlin and the U.S.S.R. Academy of Sciences in Leningrad, in charge of

W. Rieckmers Rieckmers, who had in 1913 conducted an expedition in the same region. The results of this work are not yet published in full, but much new topographical detail is already available. The scientific staff of the expedition collected much meteorological, ethnological and biological data.

Societies and Academies

PARIS

Academy of Sciences, Sept. 5 (vol. 195, pp. 505-524).—L. Mangin: Notice on Roland Thaxter.—Gr. C. Moisl: The sudden breaks of probability in stochastic evolutions.—Jean Mirguet: The paratingent of a point ensemble.—Benjamin Meisel: A property of the strain in a plane problem of the theory of elasticity.—P. F. Papcovitch: The general solution of the fundamental differential equations of elasticity, expressed by three harmonic functions.—Léon Auger: The movements of pulsating reeds in organ pipes. An experimental study of the movements of the tongue of a vibrating reed, recorded photographically, with varying wind pressure.—René Hardy and Bertrand-Lepaute: A direct reading stroboscopic radio-compass.—A. da Silveira: The Raman effect in saline solutions.—C. Gaudfroy: Correction and addition to the description of equiline and folliculine.

GENEVA

Society of Physics and Natural History, July 7.—E. Cherbuliez and Fr. Meyer: New researches on the fractionation of casein. According to recent results, casein contains at least two different constituents, one called α , insoluble in dilute ammonium chloride, whilst the other, β , is soluble in this solvent. The authors have proved that the β part itself consists of at least two substances, one precipitable in the saline solution at $pH = 3.6$ and constituting the greater part of the soluble fraction (γ), the other remaining in solution under these conditions and precipitable by acetone (δ). The proportions by weight of the three fractions in the casein have been approximately determined: α , 65-70 per cent; γ , about 30 per cent; δ , 2 per cent. Moreover, these proportions appear to be variable. The three constituents have been also characterised by their percentage composition, especially by differences in sulphur and phosphorus, and their varying proportion of tryptophane.—E. Cherbuliez and Mme. J. Stephani-Cherbuliez. The influence of the intramuscular introduction of oil on the proportion of lipases in the blood serum. As the result of work on antituberculous chemotherapy by means of oil solutions of compounds of copper, the authors have taken up the old problem of the influence of the introduction of foreign fats on the lipolytic power of the organism. In tests made on man, extending over several weeks, they have proved that intramuscular injections of olive oil and of solutions of drugs in this oil do not appreciably modify the proportion of lipases in the serum. Further work should show if the lipolytic powers, especially the leucocytes, undergo modification in the course of the treatments indicated.—W. Bader: The synthesis in two stages of acetic acid from water gas. Methanol is first prepared using vitreous oxide or sulphide catalysts, in which the spacing of the active points is not the same as in crystalline cata-

lysts. Then the methanol as methyl phosphate is combined with carbon monoxide at 300° – 320° C. and under a pressure of 100–200 atmospheres. The catalyst is a cuprous-phosphoric complex dissolved in the acid. Only acetic acid and methyl acetate are formed in this reaction.—A. A. Bron and E. Briner: Researches on the catalytic dehydration of some phenols. The authors have dehydrated a certain number of phenols, and specify the action exerted by certain chemical groups on the tendency to dehydration.—P. Bolle and E. Briner: The chemical activity of nitric acid in solution. The results deduced from the study of reactions of nitration and of absorption of nitric oxide by nitric acid show that these reactions are due to the non-dissociated fraction of the nitric acid.—E. Briner and H. Biedermann: Peculiarities of the chemical reactivity of ozone in the absence of oxygen. By replacing oxygen by nitrogen as a diluent of ozone, it has been recognised that the oxidising power of ozone on benzaldehyde is reduced to one atom of fixed oxygen for each molecule of ozone consumed.—A. J. Weigle and R. Luthi: The abnormal dispersion of amyl alcohol for short wave-lengths. The dielectric constant of a solution of amyl alcohol in a very viscous oil (Shell BL3) has been measured at -10° C. for waves varying between 334 and 2.8 metres wave-length. The dielectric constant diminishes since the dipoles of amyl alcohol no longer take up a definite position in the electric field. Moreover, this decrease does not correspond with that predicted by the Debye theory. These experiments give interesting information on the structure of liquids.—J. Weigle and H. Saini: A new apparatus for the exact determination of the dimensions of crystalline networks. An apparatus based on the Seemann-Bohlin principle has been constructed by the authors. Making use of interferences of high order, the crystal dimensions can be measured with an accuracy of about 1 in 100,000. This apparatus can be used for the determination of coefficients of thermal expansion of crystal networks.—W. H. Schopfer: The supposed vitamin action of some amines. The author's experiments, made with histamine, tyramine, glucosamine, hordenine, betaine, choline, ethylamine and ethylenediamine show that it is impossible to attribute the slightest vitamin action to these substances.

ROME

Royal National Academy of the Lincei, April 17.—L. Cambi and L. Szegő: Sulpho-salts of copper and iron. In its magnetic behaviour, the sulpho-salt $KFeS_2$ approximates to pyrites, ferrous sulphide, and many complex ferrous salts, whereas the sulpho-salts $K_mFeCu_nS_p$ recall, on one hand, pyrrhotine, and, on the other, those ferric sulpho-salts in which the iron present is assumed to have the structure of the ferric ion. The tendency to assume states approaching the diamagnetic state at low temperatures is observed with the paramagnetic sulpho-salts of iron. The sulpho-salts now under consideration are diamagnetic, as also are the copper sulphides.—Enea Bortolotti: Deformations of higher species and systems of forms for a V_m in R_n .—E. Gugino: The geodetic curvature of the lines of a Riemannian space of n dimensions.—U. Broggi: A generalisation of the developments in series of determinant functions.—Maria Cibrario: The reduction to canonical form of the linear equations to the partial derivatives of the second order of mixed type.—T. Viola: Functions of continuous limited variation towards the right.—A. Masotti:

A theorem of unicity relating to Poisson's equation.—M. Zeuli: A generalisation of the centre of the osculatrix sphere.—N. Cioranescu: The determination of a harmonic function by the initial global conditions.—Ruy Luis Gomes: The limits of the normal derivative of a simple layer potential.—G. Colonnetti: Influence of the shearing force on the deflection of a beam. (2) Further proof of the fact that the shearing force influences the deflection of an inflected beam is obtained by consideration of the case of a lattice girder with parallel top and bottom members.—F. Conforto: Impulses in isotropic elastic bodies.—D. Graffi: Adiabatic invariants as a method of approximate integration of differential equations.—G. Krall: Distant limits of the motion of a planetary system.—U. Barbieri: Astronomico-geodetic station on Bric Torniola, July 1928.—G. Viola: The periodicity of the mean annual temperature in relation to that of sunspots. For Naples, Rome, and Gaeta, the period of variability of the mean temperature is about one-half of the frequency period of sunspots. These results are at variance with those of Köppen, according to whom the mean temperature curve exhibits a course opposite to that of the sunspot curve.—Joan Y. Placinteanu: The equilibrium between matter and radiant energy. In studying the radiation of the stars, Eddington advanced the hypothesis that this radiation is always accompanied by variation in the total mass of the star, the atoms of matter undergoing transformation into particles of radiant energy, and Stern deduced a formula for calculating, for the case of thermodynamic equilibrium, the number of particles per c.c. The author now considers the conditions when photons are present and shows that Stern's formula does not then apply.—D. Bocciarelli: Radioactivity of potassium. Occhialini's method of magnetic analysis, devised for studying the β -radiation of rubidium, has been used for investigating the still feebler radioactivity of potassium.—T. Carpanese: Granite, vesuvian, ilmenite, and titanite from Monte Rosso di Verra (Monte Rosa group).

SYDNEY

Linnean Society of New South Wales, May 25.—H. J. Carter: New Guinea and Australian Coleoptera. The paper contains descriptions of twenty-two species as new, in the families Georyssidae (1 species), Buprestidae (4), Tenebrionidae (9), Cistelidae (3), and Cerambycidae (5).—J. G. Churchward: Inheritance of resistance to bunt, *Tilletia tritici* (Bjerk.) Winter, and other characters in certain crosses of 'Florence' wheat. 'Florence' was crossed with four susceptible commercial Australian varieties of wheat, each cross giving a similar result. A graph representing distribution of F_2 families in 5 per cent classes for bunt infection shows a trimodal curve indicating a single factor difference for bunt resistance. Experimental results of the crosses are given, and also results of observations on the occurrence of grass clumps and the inheritance of chaff colour.—G. A. Currie: Some notes on the biology and morphology of the immature stages of *Harpo-bittacus tillyardi*. The larvæ and pupæ of *Harpo-bittacus tillyardi* E.P. are described for the first time. Notes on the biology of the insect are given and, as the larvæ of Australian Bittacidae have hitherto been unknown, their feeding and other habits are described.

Royal Society of New South Wales, June 1.—W. H. Love: The mitotic activity of normal and malignant tissues and its modification by X-rays. This study is made from the biological, physical, and mathematical points of view. A theory of the occurrence of mitosis in normal tissue cultures (fibroblasts), and in Jensen's rat sarcoma, is developed and applied to several aspects of the problem of cell division. The quantita-

tive modifications produced by X-rays in the mitotic activity of these tissues are then studied experimentally and analytically. Within certain limits, the experimental results are in good agreement with the predictions of analysis. Outside these limits there is, in some experiments, a marked divergence between the two. The significance of this divergence is considered, and an explanation, supported by experimental evidence that seems conclusive, is advanced.—J. C. Earl and N. F. Hall: The chemical changes involved in the formation of aminoazo-compounds (1). By examining the volume-temperature curves of methanol solutions containing amine hydrochlorides and sodium nitrite, an indication has been obtained of an intramolecular rearrangement of amine nitrite to an intermediate compound prior to the formation of diazocompound or nitrosamine. When the solution is kept neutral by employing equimolecular proportions of amine hydrochloride and sodium nitrite, the change does not take place, nor, in the case of aniline, does the solution show any coupling with alkaline β -naphthol. Addition of a small quantity of acid to such a mixture brings about the formation of diazocompound as shown by the coupling reaction with β -naphthol (*cf.* Wallach, *Annalen*, 257, 319).—Thelma M. Reynolds: Note on the action of titanium tetrachloride on tetracetyl- β -*d*-glucosido-glycolic ester. Tetracetyl- β -*d*-glucosido-glycolic ester (Fischer and Helferich, *Annalen*, 383, 81; 1911) reacts with titanium tetrachloride in the same manner as the fully acetylated sugars (Pacsu, *Ber.*, 61, 1508; 1928) giving acetochloroglucose, whereas the β -glucosides previously studied (Pacsu, *loc. cit.*; *J. Amer. Chem. Soc.*, 52, 2563; 1930) were rearranged into the corresponding α -glucosides.

Forthcoming Events

MONDAY, OCT. 17

- KING'S COLLEGE, LONDON.—Prof. Claude F. A. Schaeffer: "The Excavations at Ras Shamra in Syria—the Results of the Four First Expeditions, 1929–32", at 5.30 (succeeding lectures on Oct. 20 and 21).
- LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE (Heath Clark Lectures).—Prof. Carl Prausnitz: "The Teaching of Preventive Medicine in Europe", at 5 P.M. (succeeding lectures on Oct. 18, 19, 20 and 21).

TUESDAY, OCT. 18

- EUGENICS SOCIETY—(at the rooms of the Linnean Society, Burlington House, Piccadilly, W.1).—Dame Helen Gwynne-Vaughan: "The Contribution of Plants to the Study of Heredity", at 5.30 P.M.
- HACKNEY AND NEW COLLEGE, LONDON—(Drew-Lecture at the Memorial Hall, Farringdon Street).—Prof. John Macmurray: "The Conservation of Personality."
- IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY.—Air Commodore J. A. Chamier: "Air Power", at 5.30 P.M. (succeeding lectures on Oct. 25, Nov. 1, 8, 15 and 22).
- UNIVERSITY OF LEEDS.—Prof. John Garstang: "Further Discoveries at Jericho", at 8 P.M.
- ROYAL COLLEGE OF PHYSICIANS—(Harveian Oration).—Sir George Newman, at 4 P.M.

WEDNESDAY, OCT. 19

- FOLK-LORE SOCIETY—(at University College, Gower Street, W.C.1).—Mr. Bertram Thomas: "Arab Folk Stories Heard in the Rub' al Khali", at 8 P.M.

THURSDAY, OCT. 20

- BEDFORD COLLEGE FOR WOMEN—(Fawcett Lecture).—Dr. C. R. Fay: "Women as Wage-earners and the Significance thereof in the Development of Economic Theory", at 5.15 P.M.

No. 3285, VOL. 130]

CHADWICK PUBLIC LECTURE—(at the Royal United Services Institution, Whitehall).—Sir Humphry Rolleston, Bart.: "The Pioneers and Progress of Preventive Medicine", at 5.15 P.M.

CHILD STUDY SOCIETY, LONDON—(Cockburn Memorial Lecture).—Dr. P. B. Ballard: "Thirty Years' Progress in London Education", at 6 P.M.

INSTITUTION OF ELECTRICAL ENGINEERS—(Inaugural Address).—Prof. E. W. Marchant, at 6 P.M.

FRIDAY, OCT. 21

NORTH EAST COAST INSTITUTION OF ENGINEERS AND SHIPBUILDERS—(Annual General Meeting).—Mr. R. J. Walker (Presidential Address).

Official Publications Received

BRITISH

Colony and Protectorate of Nigeria. Annual Report on the Geological Survey for the Year 1931. Pp. ii+40+4 maps. (Lagos: C.M.S. Bookshop; London: The Crown Agents for the Colonies.) 2s. 6d. net.

Ordnance Survey. Re-Leveling of London, commenced January, 1931. Abstracts of Secondary Lines (giving Values in Advance of publication, on the Newlyn Datum, for use with existing Large Scale Maps.) By Brigadier H. St. J. L. Winterbotham. Pp. 51+1 plate. (Southampton: Ordnance Survey Office.) Paper, 7s. 6d. net; cloth, 8s. 6d. net.

Battersea Polytechnic. Calendar of Evening and Afternoon Courses and Classes for Session 1932–33. Pp. 31. Free. Technical College for Day Students and Day School of Art and Crafts. Calendar, Session 1932–33. Pp. 50. 3d. Domestic Science Department and Training College. Full-time Day Instruction, Afternoon and Evening Classes, Session 1932–33. Pp. 32+1 plate. 3d. Department of Hygiene and Public Health. Session 1932–1933. Pp. 23. 3d. (London.)

The Quarterly Journal of the Geological Society of London. Vol. 88, Part 3, No. 351, August 29th. Pp. 311–515+plates 19–30+cxxv. (London: Longmans, Green and Co., Ltd.) 7s. 6d.

The Year's Work in Librarianship. Vol. 4, 1931. Edited for the Library Association by Arundell Esdaille. Pp. vii+296+4 plates. (London: The Library Association.) 7s. 6d. net; to Members, 5s. net.

East London College (University of London.) Calendar, Session 1932–1933. Pp. 211. (London.) 1s.

Advisory Department of the Imperial College of Tropical Agriculture. Report on the Agricultural Department, St. Vincent, for the Year 1931. Pp. vi+32. (Trinidad.) 6d.

Papers and Proceedings of the Royal Society of Tasmania for the Year 1931. Pp. iv+136+19 plates. (Hobart: Tasmanian Museum.) 10s.

Advisory Department of the Imperial College of Tropical Agriculture. Report on the Agricultural Department, St. Lucia, 1931. Pp. iv+43. (Trinidad.) 6d.

University of London: University College Faculty of Medical Sciences, University Centre for Preliminary and Intermediate Medical Studies. Courses for Dental Students, Session 1932–1933. Pp. vi+269–304+12. (London.)

FOREIGN

Scientific Papers of the Institute of Physical and Chemical Research. Nos. 373–375: Hyperfine structure of Mercury Spectrum, VI, by K. Murakawa; Hyperfine Structure of Arc and Spark Spectra of Barium, by K. Murakawa; Diffraction of Cathode Rays by Single Crystals, Part 2: Mean Inner Potentials of some Crystals, by K. Shinohara. Pp. 299–322+plates 11–13. 35 sen. No. 376: Über Rotenon, den Wirksamen Bestandteil der Derriswurzel, Mitteilung I–XIII. Von S. Takei, S. Miyajima und M. Ono. Pp. 26. 20 sen. (Tokyo: Iwanami Shoten.)

University of Chicago. Publications of the Yerkes Observatory, Vol. 7, Part 2: A Study of the Spectrum of γ Aurigae. By Edwin B. Frost, Otto Struve and C. T. Elvey. Pp. vi+52+3 plates. (Chicago: University of Chicago Press; London: Cambridge University Press.) 8s. 6d. net.

Conseil Permanent International pour l'Exploration de la Mer. Journal du Conseil. Vol. 7, No. 2. Rédigé par E. S. Russell. Pp. 171–336. (Copenhagen: Andr. Fred. Høst et fils.)

Museums of the Brooklyn Institute of Arts and Sciences. Report upon the Condition and Progress of the Museums for the Year ending 31st December, 1931. By William Henry Fox. Pp. 86+4 plates. (Brooklyn, N.Y.)

Field Museum of Natural History. Zoological Series, Vol. 18, No. 10: Mammals of the Kelley–Roosevelts and Delacour Asiatic Expeditions. By Wilfred H. Osgood. (Publication 312.) Pp. 191–339+plates 9–11. (Chicago.) 75 cents.

Report of the Aeronautical Research Institute, Tokyo Imperial University. No. 80: Studies on the Sounds emitted by Revolving Airscrews. Part 2: Experiments with Model Airscrews. By Jūichō Obata, Yakei Yosida and Sakae Morita. Pp. 389–440. 0.87 yen. No. 81: On Hollow Spindle-shaped Liquid Jet. By Kyōji Itō. Pp. 441–467+8 plates. 0.50 yen. (Tōkyō: Kōsei Publishing House.)

Proceedings of the United States National Museum. Vol. 80, Art 21: Insects of the Order Orthoptera of the Pinchot Expedition of 1929. By A. N. Caudell. (No. 2921.) Pp. 7. (Washington, D.C.: Government Printing Office.)

Proceedings of the Imperial Academy. Vol. 8, No. 7, July. Pp. xix–xx+275–329. (Tokyo.)