

Societies and Academies.

LONDON.

Mineralogical Society, Mar. 20.—A. F. Hallimond: On the atomic volume relations in certain isomorphous series (2). The volume relations of compounds of calcium, strontium, barium, with oxygen, sulphur, selenium, and tellurium correspond in every way with those previously indicated for potassium, rubidium, caesium, sodium, lithium, and the halogens. The difference in the volume produced by the interchange of eutropic elements exhibits a constant ratio in each series. The partial volumes calculated for the radicles from the volumes of the free metals agree with those already obtained for the alkali compounds, and the values for oxygen and fluorine agree with those calculated by Wasastjerna from the refractive indices. The volume effect of substitution in the sodium chloride lattice varies somewhat with the size of the cell, but the variation never attains the extent required for a law of constant radii. Other isomorphous series agree with the Law of Retgers, and the present results are therefore expressed in terms of a law of additive volumes rather than additive radii.—**A. Holmes and H. F. Harwood:** On the age and composition of the Whin Sill and the related dikes of the north of England. The rocks of the Whin Sill and its associated dikes are quartz-dolerites of substantially identical composition. Dikes of this series run north of east. They are quite distinct from the system of tholeiite dikes to which the Bingfield dike, the 'Brunton type' of Teall, belongs. A pebble of quartz-dolerite in the Upper Brockram of George Gill, Brackenber Moor, near Appleby, has been proved by chemical analysis to be definitely of the Whin Sill type. This, with other evidence, indicates that the age of Whin Sill and its associated dikes is post-Westphalian and pre-Upper Brockram.—**A. W. Groves:** The identification of dumortierite in grains: dumortierite in Cornish granite. Dumortierite may be confused with a number of more common minerals. It is recorded in several sediments in southern England and in the Land's End granite.—**T. V. M. Rao:** On 'bauxite' from Kashmir, India. The so-called bauxite of Kashmir consists mainly of diaspore and an opaque mineral corresponding in composition to a monohydrate of alumina. The deposit was derived from beds of clay, having been first altered into the dihydrate (bauxite) and afterwards to its present condition through dehydration and thermodynamic metamorphism.

Linnean Society, Mar. 29.—Malcolm Wilson and Miss M. J. F. Wilson: The Dutch elm disease and its occurrence in England. The Dutch elm disease was discovered in Holland in 1919, and during the same year in the north of France. The following year it was reported from all parts of Holland, and in 1921 was stated to be present throughout Belgium. In the same year it was recorded from western Germany, and since that date has spread over the greater part of that country. An outbreak of the disease was discovered near London last July. Three explanations have been offered as the cause of the epidemic: (1) The fungus *Graphium Ulmi* Schwarz; (2) *Micrococcus Ulmi* Brusoff; (3) unfavourable climatic conditions, *i.e.* drought and frost. The first explanation is generally accepted by the Dutch investigators. The disease may be readily recognised by the yellow discoloration of the leaves in the crown of the tree or at the tips of the side branches. This condition usually spreads rapidly over the tree, and is followed by leaf-fall and by the death of the tree. Defoliation may

be complete within a week, but sometimes extends over a much longer period. Infected branches, when cut across, show one or more rings of small brown spots in the most recently formed wood. These internal symptoms sometimes, but not invariably, can be found in the roots. The disease is present in epidemic form throughout most of western Europe, and shows no sign of becoming less virulent. No species of *Ulmus* grown in Holland appears to be immune, and no adequate method of control has yet been discovered.—**R. W. Butcher and F. T. K. Pentelow:** The effect of pollution on the ecology of a small stream. An ecological study has been made during the past two years of the River Lark in West Suffolk. From September to February a beet-sugar factory empties into the river about four million gallons of waste waters a day. This water contains much organic matter and so deoxygenates the river-water; *e.g.* at one station the oxygen fell from 110 per cent. to 19 per cent. saturation. There is also an increase in the ammoniacal nitrogen. The effect on the flora is to increase the number of bacteria and cause very large growths of 'sewage fungus,' of which *Sphaerotilus natans* is the commonest. The fauna of the river may be divided into three definite ecological associations dependent on the oxygen present—the Gammarus type occurring everywhere among the weeds and among stones and gravel on the bottom, the Sialis-Sphaerium type occurring on the bottom in muddy stretches, and the Chironomid-Tubificid type which occurs in very foul mud. The effect of pollution is due to the reduction of oxygen, and results in the encouragement of Sialis-Sphaerium and Chironomid-Tubificid associations at the expense of the Gammarus type.

Society of Public Analysts, April 4.—John Evans and T. E. Wallis: Coffee parchment as an adulterant of bran and sharps. The 'parchment' consists of the thin and tough endocarp of the coffee fruit, and may be recognised by its distinctive cellular structure. When added to sharps it is usually finely comminuted, and in testing a sample a few of the suspicious pieces should be boiled with chloral hydrate solution until transparent, and a fragment mounted in chloral hydrate for microscopical examination.—**W. B. Adam:** Determination of the colour-producing constituents of the cacao bean. The two principal colour-producing constituents are cacao catechin and cacao tannin. The former has been extracted with ether and determined colorimetrically by means of Mitchell's ferrous tartrate reagent, whilst the latter is extracted with hot water and determined by precipitation as cinchonine tannate. The catechin is destroyed during fermentation, and the tannin is reduced to about 2 per cent.—**A. T. Etheridge:** Determination of vanadium in steel. The method consists in removing iron (as chloride by extraction with ether) and other interfering metals, by electrolysis over a mercury cathode, leaving a solution in which the vanadium can be determined by titration with permanganate. The process is accurate for all kinds of steels. In the case of molybdenum steels the molybdenum is removed together with the ferric chloride on extraction with ether. Manganese, like aluminium, has no influence on the final permanganate titration.—**S. G. Clarke:** Colorimetric determination of small quantities of antimony and their separation from tin. The antimony is deposited on metallic copper as in the Reinsch method, the deposited film stripped off by means of sodium peroxide, and the antimony determined colorimetrically. The method is applicable to antimony in either state of oxidation, and in the presence of tin or arsenic, but bismuth and several

of the other heavy metals give precipitates, usually coloured, with the reagents.—A. Riad : Determination of carbon dioxide in soils. Hepburn's modification of the Van Slyke method of determining carbon dioxide in carbonates (in which the evolved gas is absorbed in standard baryta solution, the excess of which is titrated with oxalic acid) has been adapted to the determination of carbon dioxide in soils. The method is suitable for general soil analysis.

PARIS.

Academy of Sciences, Mar. 12.—The president announced the death of M. Guignard.—E. Gourat : Some singular lines of surfaces admitting a given linear element.—E. Mathias : Magnetic measurements in the Haute-Marne, Côte-d'Or, and Aube. An account of work done in 1924 at forty-two stations, twenty-three of which are new.—Georges de Rham : Duality in *analysis situs*.—Paul Montel : Continued functions of a real variable, which admit a theorem of algebraic addition.—Paul Lévy : An asymptotic point of view in the study of ensembles of points on a right line.—N. Saitykow : The integration of partial differential equations by separation of the variables.—Alfred Rosenblatt : Certain stationary movements of incompressible viscous liquids.—S. de Glasenapp : Personal equations in the micrometric measurement of double stars. The method suggested is the comparison of the results of observation with the values, assumed to be known exactly, of the angles of position θ_0 and distances ρ_0 for a certain number of comparison stars, such that the relative displacement of the components is negligible. To facilitate the application of the method a list of comparison stars is given, uniformly distributed over the sky, with varied angles of position and distances ρ less than $3''$.—Mme. E. Chandon : The tides of the Red Sea. Correction of an error in the calculations of A. Blondel. The differences between the observed and calculated values do not exceed 2 cm., and it is concluded that friction does not have any appreciable effect on tides in the Red Sea.—A. Lambert : The velocity of propagation of radiotelegraphic waves. The velocity as determined by recent experiments would appear to be appreciably lower than 300,000 km. per second, the mean result being 247,000 km./sec. \pm 9000.—Canaud : The electrolysis of water by an alternating current. If the water is allowed to reach its boiling-point some hydrogen is evolved at a regular rate, in amount corresponding to about $\frac{1}{3}$ of that which would have been produced by the corresponding continuous current. Iron electrodes were employed.—Svend Aage Schou : The absorption spectrum of formaldehyde in solution. Previous work has proved that aqueous solutions of formaldehyde contain only the polymerised form. The monomolecular aldehyde in hexane at -70°C . gives a spectrum with at least 17 bands between 3542 and 2750 A., the positions of which are given.—A. Boutaric and Mlle. G. Perreau : The determination of dilute saline solutions by the opacity of fine suspensions obtained starting with these solutions. An account of attempts to stabilise precipitates, such as silver chloride, by the addition of various colloids.—J. Huggett and G. Chaudron : The thermomagnetic study of some iron minerals.—P. Nicolau : Annealing anomaly of copper and brasses after hammer hardening.—L. Bert : A new general synthetic method for preparing arylaliphatic aldehydes. In a previous communication the author has given a method for preparing the chlorides $\text{RC}_6\text{H}_4(\text{CH}_2)_n\text{Cl}$. The magnesium compounds prepared from these condensed with methyl orthoformate give good yields of the acetals of the aldehydes $\text{RC}_6\text{H}_5(\text{CH}_2)_n\text{CHO}$,

from which the corresponding aldehydes are readily obtained by hydrolysis with hydrochloric acid. Details of new aldehydes prepared by this method are given.—Albert Kirrmann : The action of amines on bromo-cenanthol.—Vavon and V. M. Mitchovitch : The *o*-cyclohexylcyclohexanols.—R. Locquin and R. Heilmann : The separation of the stereoisomeric unsaturated ketones.—L. Neltner : The geology of the Goundafi country (Morocco Haut Atlas).—J. Repelin : The Aquitaine basin at the Helvetian epoch : the marine gulf.—G. Mangenot : The cytological localisation of the peroxydases and the oxydases.—Tsen-Cheng : The phenomena of necrosis in potato disease. The necrosis of the diseased potato is in most cases only an exaggeration of the normal destruction of the sieve tubes accompanied by defensive reactions on the part of the neighbouring cells.—Auguste Lumière and Mme. R. H. Grange : The comparative toxicities of sera arising from venous blood and blood from the umbilical cord.—Henri Pottevin and Robert Faillie : The variation of the visual psychomotor reaction as a function of the lighting.—Jean Verge and Edmond Grasset : Researches on the microbial flora of frozen eggs. Amongst the organisms found in Chinese eggs were some belonging to the paratyphic and coli groups, which might possibly give rise to toxic infections. The eggs should be sterilised by heat during preparation as food.

GENEVA.

Society of Physics and Natural History, Feb. 16.—F. Chodat : The specificity of *Stichococcus*, more particularly from the soil of the [Swiss] National Park. The author communicates the results of his tests for Algae in the soils of the National Park and presents a first series of pure cultures belonging to the genus *Stichococcus*.—Amé Pictet and H. Vogel : The synthesis of cane sugar. When fructose is treated with acetic anhydride, it forms a normal tetracetate and an isomer. An equimolecular mixture of these two substances, suitably treated, leads to the synthesis of cane sugar.—O. Jaag : New researches on the gonidia of lichens. These researches lead to the proof, for the two varieties of the lichen studied (*Parmelia caperata*), of the formation of gametes, a new fact for algae of lichen symbiosis, and also to the existence of zoospores different from those already described.—F. Wyss-Chodat : The transmissibility to the animal of the parasite of fungoid mycosis. The author has studied a fungus isolated from the skin and from the ganglion of a subject attacked with fungoid mycosis. From the observations it must be admitted that this is a parasitic disease. The inoculation of mice has given results confirming this hypothesis.—R. Wavre : Figures of equilibrium of a heterogeneous fluid mass. The author brings forward some results new to the solution of this problem of rational mechanics. These results, which are unsuitable for abstraction, lead to important modifications of the laws of rotation of planets in the fluid state.—M. Gysin : The application of the methods of Fedorow to the identification of microcline without macles. The author's researches allow of the identification of the mineral in gneiss and prevent the confusion frequently made between microcline and orthose.

Mar. 1.—G. Déjardin : (1) Recent spectroscopic applications of the electrodeless discharge. Experiments made on different substances, phosphorus in particular, show that the spectra characteristic of different degrees of ionisation may be separated by utilising the electrodeless discharge to produce them. (2) The filtration of the solar radiation by ozone.

(Observations carried out at the Mont Blanc Observatory, from 1923 to 1926, in collaboration with Lambert and Chalonge.) These experiments show that for each zenithal distance of the sun the curve representing the variations in absorption as a function of the wave-length reproduces perfectly, in certain regions of the spectrum, all the known details of the absorption curve of ozone. From this it is deduced that the ozone should be found localised, for the greater part, in a zone situated about 45 kilometres above the earth.

ROME.

Royal National Academy of the Lincei, Jan. 8.—**F. Severi**: Simple and double algebraic integrals (1 and 2).—**G. Fubini**: A new generation of Darboux's quadratics.—**U. Cisotti**: An exception to Kutta-Joukowski's theorem.—**N. Parravano** and **G. Malquori**: Molybdenum sulphides. (1) Tensions of the sulphur of molybdenum trisulphide. The logarithm of the tension of the sulphur of molybdenum trisulphide is a linear function of the temperature, the emission of the sulphur vapour being irreversible.—**P. Vinassa de Regny**: The geochemical inertia of the triad elements. As a general rule, both simple and compound substances, whether natural or artificial, organic or inorganic, have even molecular numbers. Almost the whole of the earth's mass is composed of substances with atomic numbers below 28, that is, those of the first triad. The geochemical inertia of the elements of the triads may be related to the number and disposition of the electrons corresponding with a condition of equilibrium.—**S. Franchi**: The series of rocks from the Priabonian to the Noric in the neighbourhood of Albenga.—**L. A. Herrera**: Artificial albuminoid cells. Imitations of the natural cells of organisms may be made with the help of egg albumin.—**S. Minetti**: The necessary and sufficient conditions that an entire function may be of a certain genus and of a certain order.—**Rosalind Cecily Young**: The values of the integral $\int_a^b f(x)dg(x)$ of a function $f(x)$ with a non-integrable point, in relation to $g(x)$.—**V. Hlavatý**: Linear differential systems with an indefinite quadratic integral.—**E. Pistolesi**: A supposed exception to Kutta-Joukowski's theorem. Investigation of the problem of a plane strip in an indefinite current, with circuitation different from zero, regarded by Cisotti as an exception to Kutta-Joukowski's theorem, shows that this is not the case, and places beyond doubt the quite general character of the theorem.—**M. Maggini**: The effective wave-length of [radiation from the] stars and a method of determining it by means of the interferometer.—**G. Andrisi**: The absorption of stellar light in the atmosphere of Rome.—**M. Bossolasco**: Plasticity in the phenomena of orogenesis.—**U. Panichi**: Diabases and melanocratic veinous rocks of Sardinia.—**G. Quagliariello**: Action of cold on the fats of milk. The lowering of the surface tension of milk cooled below 10° C. is dependent on the passage of triglycerides of the lower fatty acids from the globules into the interglobular liquid, in which they dissolve.—**G. Martino**: Different contents in 'phosphogen' of striated muscle under rapid and under torpid contraction.—**G. Brunelli**: Anatomico-physiological investigations on the significance of the intra-hepatic pancreas in the Teleostei.—**G. Brunelli** and **G. Fasella**: A very rare cetacean on the coast at Nettuno. A cetacean, stranded near Foco Verde in Nettuno in November last, belongs to the genus Mesoplodon and is probably *M. bidens*.—**R. Savelli**: Giant seeds and a case of poly-endospermia due to extraneous pollination on *Nicotiana rustica*.—

E. Francini: Phenomena of somatic asporia, gonial asporia, and adventitious embryony in *Ochna multiflora*.

WASHINGTON, D.C.

National Academy of Sciences (*Proc.*, Vol. 14, No. 1, January).—**Raymond Pearl**, **Agnes Allen Winsor**, and **John Rice Miner**: The growth of seedlings of the cantaloup, *Cucumis melo*, in the absence of exogenous food and light. The growth in length of cantaloup seedlings grown in the dark on a sterilised medium and supplied only with sterilised water, with or without fresh supplies of sterilised air, follows a logistic curve essentially the same as that for normal growth.—**David White**: Some factors in rock metamorphism. The progressive transformation of carbonaceous sediments can be used as a scale for the determination of the stages of incipient metamorphism. Carbonisation is the result mainly of horizontal thrust, temperature, and time, of which the former is of pre-eminent importance. Vertical pressure is relatively insignificant in effect; it assists the strata to resist buckling and helps to raise the temperature. The time factor only becomes important in the presence of advanced pressures and their consequent temperatures.—**D. F. Hewett**: Late Tertiary thrust faults in the Mojave Desert, California. The Spring Mountains and adjacent ranges contain at least six extensive overthrust faults and numerous minor thrusts as well as normal faults. They dip westward at angles of 5°-45°, and rocks ranging from pre-Cambrian granite gneiss to Pennsylvanian limestones are thrust generally eastward upon younger rocks ranging from lower Palaeozoic to Jurassic. The thrust faults seem to have been formed in early Eocene times.—**Raymond T. Birge**: The quantum levels and resulting constants of the hydrogen molecule (*v. NATURE*, Jan. 28, p. 134).—**Charles S. Barrett**: The scattering of X-rays from gases. Filters of strontium oxide and zirconium oxide, each adjusted to absorb 50 per cent. of molybdenum $K\beta$ radiation, are well matched at all wave-lengths except between their K absorption limits; the two thus give practically monochromatic radiation (Prof. P. A. Ross). Such a beam is passed through a gas chamber and into an ionisation chamber. It is concluded that interference occurs in X-rays scattered from a single molecule of carbon dioxide or oxygen, and is absent in rays scattered from a hydrogen molecule (between 30° and 90°).—**Louis S. Kassel**: The distribution of energy in molecules. In a group of oscillators in statistical equilibrium, some classical and some quantum, the latter all having the same frequency, the chance that a given classical oscillator shall have energy equal to or greater than m quanta is exactly the same as the chance that a given quantum oscillator shall have m or more quanta.—**I. S. Bowen**: The life of atomic states and the intensity of spectral lines. The origin of the strong nebular spectral lines in electron jumps from metastable states in oxygen and nitrogen is evidence that metastable states are states of long mean life and not absolutely metastable. If the ratio of the mean time between collisions of the second kind to the mean life of the state before spontaneous emission is small, the majority of the atoms are taken out of the excited state by collisions of the second kind and the line is weak; if the ratio is large (as it is under nebular conditions) the atoms can radiate spontaneously and the line appears strongly. This explanation is applicable to other anomalous line intensities and suggests a gradation of mean lives from 10⁻⁸ sec. (normal lines) to 1 sec. or more (nebular lines).—**R. J. Lang**: The spectra of singly and doubly ionised

germanium (Ge II and III).—Jared Kirtland Morse: (1) The structure and dimensions of the ethane molecule. A scale model is built up, using the cubic lattice already employed in discussing the crystal lattices of diamond and graphite. (2) The lattice structure of ethane. The model constructed would cause diffraction effects agreeing well with Mark and Pohland's results for solid ethane, except in regard to the 004 plane.—R. A. Millikan and C. C. Lauritsen: Relations of field-currents to thermionic-currents. It has been shown by Millikan and Eyring that in the extraction of electrons from metals, the electrons constituting the field current are not identical with the thermions and, over a range of 700° C., are independent of temperature. The data used, and also new data, give curves for the relationship between $\log i$ (i =field current) and $1/F$ (F =applied field) which are straight lines. At sufficiently high temperatures the thermionic- and field-currents are not independent. A combined formula is obtained showing that the application of an external field is equivalent to increasing the temperature of the electrons within the metal.—Gregory Paul Baxter and Howard Warner Starkweather: (1) The density, compressibility, and atomic weight of neon. In purification, the gas was absorbed on chabazite cooled with liquid oxygen or nitrogen. The density and atomic weight found are 0.89990 and 20.182 respectively. (2) The density, compressibility, and atomic weight of argon. The normal density is 1.78364, the limiting density is 1.78204, and the atomic weight 39.943. These values assume that the conventional method of calculating the deviations from Boyle's law is correct; a more rigorous investigation, however, only makes a difference of so much as 0.00001 in a few of the results.—A. M. Showalter: The chromosomes of *Pellia Neesiana*. The male and female plants contain nine chromosomes. One of those of the female seems to be an X-chromosome; in the growing regions, it remains condensed throughout the interphases, recalling the behaviour of sex chromosomes from spermatogonia of animals.—T. H. Goodspeed and A. R. Olson: The production of variation in *Nicotiana* species by X-ray treatment of sex cells. Mature plants bearing flower buds were subjected to X-ray bombardment for 10 min. or 20 min. Their seed gave more than 20 per cent of morphologically abnormal plants, but only rarely were the variants completely sterile. Similar effects are obtained if only the male sex cells are irradiated. Cytological examination of the variants shows that, in some of them, one of the meiotic chromosomes has an appendage similar to that born by many somatic chromosomes.—L. J. Stadler: Genetic effects of X-rays in maize. Heavy treatment reduces considerably the yield and viability of pollen, but seems to have no effect on crossing-over in a particular region of the chromosome; it does increase, however, the percentage of seed with mosaic endosperm when crosses of an endosperm dominant with an endosperm recessive are used.—Edward Kasner: General theory of polygenic or non-monogenic functions. The derivative congruence of circles.—G. A. Miller: Number of systems of imprimitivity of transitive substitution groups.—R. L. Moore: Concerning triods in the plane and the junction points of plane continua.—Cecilia H. Payne and Frank S. Hogg: On methods and applications in spectrophotometry. The work being carried out at Harvard in this field is described and discussed. It should result in placing several qualitative astrophysical arguments on a quantitative basis.—Willard Owen Thompson, Phebe K. Thompson, and Mary Elizabeth Dailey: The effect of posture upon the composition

and volume of the blood in man. In standing still, the blood suffers a net loss of about 11 per cent. of the total plasma volume of approximately protein-free fluid, due to increase in capillary pressure. The loss, which occurs in 20-30 min. and is recovered in a similar time on lying down, is greatest at the extremities.—Alfred J. Lotka: Sterility in American marriages. Using the data for 1920 of the United States Census Bureau, it is calculated that the effective sterility of American (white) wives is 17.1 per cent. Of this total, 1.2 per cent. is due to premature death of wives, 2.0 per cent. to premature death of husbands, and 0.8 to divorcees. The net sterility of American (white) wives is thus 13.1 per cent.—Louis Harris: The photochemical union of hydrogen and chlorine. The apparatus was entirely of quartz and the reaction vessel was illuminated with light of wave-length greater than 4050 Å. A thermopile behind the reaction tube measured the energy available. The final hydrogen pressure was measured after freezing out the hydrogen chloride formed and the unchanged chlorine. The minimum yield with excess of hydrogen was 6×10^5 molecules of hydrogen chloride per quantum of light.

Official Publications Received.

BRITISH.

- Government of Bengal: Irrigation Department. Report on Rainfall and Floods in North Bengal, 1870-1922. By Prof. P. C. Mahalanobis. Pp. v+90+82 maps. (Calcutta: Bengal Secretariat Book Depot.) 20 rupees; 30s.
- The National Benzole Association. Fifth Report of the Joint Benzole Research Committee of the National Benzole Association and the University of Leeds. (Presented March 21st, 1928.) Pp. iv+237 (London: National Benzole Association.)
- Colony of the Gambia. The Annual Report of the Department of Agriculture for the Period January 1st, 1926, to March 31st, 1927. Pp. 53. (London: The Crown Agents for the Colonies.) 5s.
- Imperial Department of Agriculture for the West Indies. Report on the Agricultural Department, Dominica, 1926-27. Pp. iv+41. (Trinidad, B.W.I.) 6d.
- The Journal of the East Africa and Uganda Natural History Society. No. 30, July 1927. Pp. 55-110+25 plates. (Nairobi.) 5s.; to non-Members, 10s.
- Report of the Felsted School Scientific Society for the Years 1926 and 1927. (No. 30.) Pp. 40. (Felsted.)
- Papers and Proceedings of the Royal Society of Tasmania for the Year 1927. Pp. vi+237+23 plates. (Hobart: The Tasmanian Museum.) 10s.
- Ceylon Journal of Science. Section B: Zoology and Geology. Spolia Zeylanica. Edited by Dr. Joseph Pearson. Vol. 14, Part 2, March 12th. Pp. 135-349. (Colombo: Colombo Museum; London: Dulau and Co., Ltd.) 3 rupees.
- Rhodesia Museum, Bulawayo. Twenty-sixth Annual Report, 1927. Pp. 12. (Bulawayo.)
- Proceedings of the Society for Psychical Research. Part 105, Vol. 38, April. Pp. 16. (London: Francis Edwards, Ltd.) 1s. 6d.
- Agricultural Research Institute, Pusa. Bulletin No. 171: The Improvement of Indian Wheat; a Brief Summary of the Investigations carried out at Pusa from 1905 to 1924, including an Account of the new Pusa Hybrids. By Albert Howard and Gabrielle L. C. Howard. Pp. v+26. (Calcutta: Government of India Central Publication Branch.) 8 annas; 10d.
- Supplement to *The Journal of Ecology*. 1, February. British Empire Vegetation Abstracts: Titles and Abstracts of Publications on the Vegetation and Ecology of the Overseas Empire and on related Topics. Pp. 20. (Kew, Surrey: British Empire Vegetation Committee; Hon. Secretary: Dr. T. F. Chipp, 199 Kew Road.) Subscription price, 5s. a Year.
- Transactions of the Optical Society. Vol. 29, No. 2, 1927-28. Pp. 49-100. (London.) 10s.
- Board of Education. Educational Pamphlet, No. 57: Memorandum on the Teaching of Building Science to Students attending Courses of Instruction in Building and the Building Trades. Pp. 16. (London: H.M. Stationery Office.) 3d net.
- University Grants Committee. Returns from Universities and University Colleges in receipt of Treasury Grant, 1926-1927. Pp. 24. (London: H.M. Stationery Office.) 3s. net.
- Apia Observatory, Apia, Western Samoa. Report for 1925. Pp. 95+3 plates. (Wellington, N.Z.: W. A. G. Skinner.)
- Reports of the Council and Auditors of the Zoological Society of London, for the Year 1927, prepared for the Annual General Meeting to be held on Monday, April 30th, 1928, at 4 p.m. Pp. 91. (London.)

FOREIGN.

- Department of the Interior: Bureau of Education. Bulletin, 1927, No. 19: State Laws and Regulations governing Teachers' Certificates. By Katherine M. Cook. Pp. v+296. 40 cents. Bulletin, 1927, No. 33: Statistics of Public High Schools, 1925-1926. Pp. 92. 10 cents. Bulletin, 1928, No. 1: Educational Directory, 1928. Pp. iii+144. 20 cents. (Washington, D.C.: Government Printing Office.)