

Calendar of Discovery and Invention.

November 28, 1660.—The first official record of the Royal Society reads as follows: "Memorandum that Novemb. 28, 1660, These persons following, according to the usuall custom of most of them, mett together at Gresham College to heare Mr. Wren's lecture, viz. The Lord Brouncker, Mr. Boyle, Mr. Bruce, Sir Robert Moray, Sir Paul Neile, Dr. Wilkins, Dr. Goddard, Dr. Petty, Mr. Ball, Mr. Rooke, Mr. Wren, Mr. Hill. And after the lecture was ended, they did according to the usual manner withdraw for mutual converse. . ."

November 28, 1867.—In a letter of this date, Gassiot told Tyndall the following story of Davy entering Pepys' shop in the Poultry. Showing him a letter Davy said, "Pepys, what am I to do, here is a letter from a young man named Faraday; he has been attending my lectures and wants me to give him employment at the Royal Institution—what am I to do?" "Do?" replied Pepys, "put him to wash bottles; if he is good for anything he will do it directly, if he refuses he is good for nothing." "No, no," replied Davy, "we must try him with something better than that." The sequel was that Faraday was employed to assist Davy in the laboratory.

November 30, 1845.—One of the most remarkable days in the history of railways was Nov. 30, 1845, the day fixed by the Board of Trade for lodging plans and specifications for new lines. Extraordinary measures were adopted for producing the documents and for getting them to London in time. No fewer than 1200 companies were started that year, the capital represented by the schemes amounting to £560,000,000. In 1846, 600 railway bills were actually brought forward, and it was then that 'the battle of the gauges' set in. It was, however, only on Brunel's Great Western line that the 7-foot gauge was used.

December 2, 1846.—Some of the earliest experiments in arc lighting were made by Staite and Petrie, who worked together at various problems. To Petrie was due the invention of the first truly self-regulating arc light, while on Nov. 28 and Dec. 2, 1846, he demonstrated the use of his light from the portico of the National Gallery.

December 2, 1856.—On this day Friedrich and Wilhelm Siemens took out the British patent for their regenerative furnace, which a few years later found its most important application in the open hearth method of making mild steel by the Siemens Martin process—a process by which to-day more than 80 per cent. of the steel of the world is produced.

December 2, 1857.—"The advantages of science in nautical affairs," said Mr. Fillmore, President of the United States, on Dec. 2, 1857, "have rarely been more strikingly illustrated than in the fact stated in the report of the Navy Department, that by means of the Wind and Current Charts projected and prepared by Lieutenant Maury, the Superintendent of the Naval Observatory, the passages from the Atlantic to the Pacific ports of our country have been shortened by about forty days." A writer three years later calculated that Maury's work saved the country more than 2,000,000 dollars per annum, and that a British sailing vessel on passage from England to Australia saved £1200 by the use of his charts.

December 3, 1847.—It was on Dec. 3, 1847, that Lyon Playfair wrote to James Young telling him of a petroleum spring in Reddings Colliery, Alfreton, Derbyshire, and suggesting he might turn it to account. The flow of oil was only about 300 gallons a day and this rapidly diminished, but it was through this enterprise that Young was led to experiment on the distillation of oil from coal, and thus laid the foundation of the shale oil industry.

E. C. S.

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Societies and Academies.

LONDON.

Royal Society, Nov. 10 (continued from p. 754).

EXPERIMENTAL PHYSICS.

R. S. Edwards: On the effect of temperature on the viscosity of air: New measurements have been made on the variation with temperature of the viscosity of air over the range of 15° C. to 444° C., to test the accuracy of the results obtained by F. A. Williams. The present measurements corroborate those of previous observers and not those of Williams. It is concluded that there is no breakdown of Sutherland's law in the region of 250° C., and that Sutherland's constant is constant over the whole of the range mentioned above.

P. Kapitza: Further developments of the method of obtaining strong magnetic fields. These fields are obtained for a short period of time only, as it is thus possible to apply large powers to the coil without overheating it. In this manner fields of 100,000 gauss have been obtained. It is now possible to use larger powers. In the place of accumulators a large generator by means of which powers up to 50,000 kilowatts can be obtained in the coil for $\frac{1}{10}$ sec. has been used. Up to the present, magnetic forces up to about 350,000 gauss have been obtained in a volume of 2 c.c.

F. H. Rolt and H. Barrell: Contact of flat surfaces. The object of this investigation was to inquire into the phenomenon of 'wringing' which is used extensively in forming combinations of gauge blocks of the Johansson type. These gauges, which are of hardened steel, have their important surfaces finished to a high degree of flatness, and when brought into intimate contact are found to adhere together very strongly. The adherence depends to a large extent upon the smoothness of the surfaces; so much so, that gauges having optically polished surfaces can be made to adhere when quite clean, whereas those having a 'lapped' finish require the introduction of a very fine film of oil or other liquid to produce the effect. Repeated wringing together of gauges causes slight but measurable wear of their surfaces. The adherence is explained as the molecular attraction between the surface molecules of the gauges. In the case of lapped surfaces, the average separation between the molecules on the two surfaces is considerably greater than with smooth surfaces, and the function of the oil film in the former case is to act as a link between the more widely separated molecules.

W. Mandell: The determination of the elastic moduli of the piezo-electric crystal Rochelle salt by a statical method. Rochelle salt possesses piezo-electric properties, the magnitude of the effect being several hundred times greater than with quartz. The effect is associated only with crystals having an asymmetric structure, and occurs when the crystal is submitted to mechanical stresses. It would therefore appear that the phenomenon may be closely related to its elastic properties. Elastic surfaces were obtained giving a numerical measure of the extension per unit length for unit tension for all directions in the crystal, whilst other surfaces give the amount of torsion per unit couple. Rochelle salt almost loses its piezo-electric properties in a very abrupt manner on raising the temperature above 23° C. The elasticity was measured by the 'bending-beam' method for temperatures above and below this critical point, but any change in elasticity due to molecular re-arrangement was too small to be measured by this method. Piezo-electric crystals exhibit a change in double refraction

when submitted to an electrostatic stress. Pockels carried out experiments to determine whether this electro-optical phenomenon was due solely to the mechanical deformation caused by the electric field or whether there was also a direct influence of the electrostatic force on light motion in these crystals. On inserting the values of the elastic moduli found in the present paper in Pockels' results, the electro-optical effect due to the electrostatic field is about five times greater than that obtained by the mechanical effect alone. Thus the result for Rochelle salt agrees with that for sodium chloride and silica, namely, that an electrostatic field *does* exert a direct influence in piezoelectric crystals.

W. G. Burgers: Investigation of the molecular arrangement of uniaxial optically active crystals. Crystals of *d*-potassium rhodium oxalate, sodium metaperiodate, ethylenediamine sulphate, guanidine carbonate, are either truly uniaxial or so nearly so that the difference is inappreciable. Their optical activity is to be ascribed to a special atomic arrangement in a certain unit of structure. The similarity between the rotatory dispersion curves of crystals and of solutions of *d*-potassium rhodium oxalate is not due to the presence of parallel molecules in the crystalline state. The molecules are spirally arranged in the crystal. Potassium lithium sulphate an exceptional example of an optically active crystal. In this case there is special difficulty in making sure about the presence or absence of a lamellar structure.

H. E. Watson: The dielectric constants of ammonia, phosphine and arsine: The dielectric constants were measured at temperatures near to -47° , 16° and 100° C. and at frequencies of approximately 300, 1050 and 1800 kc. A heterodyne method was used. The results are independent of the frequency within the limit of experimental error. The quantity $\epsilon - 1$ is proportional to the density, although there is some uncertainty as to the compressibility correction. The results for the variation of ϵ with temperature are satisfied approximately by Debye's equation, and the mean values for the electric moments of the molecules calculated by it are 1.49×10^{-18} for ammonia, 0.55×10^{-18} for phosphine, and 0.15×10^{-18} or possibly less for arsine.

W. K. Hutchison and C. N. Hinshelwood: The relative stability of nitrous oxide and ammonia in the electric discharge. In discharge tubes at low pressure, ammonia is five to seven times as stable as nitrous oxide. Since this ratio remains of the same order when different electrode materials are used, and when the discharge is passed through the two gases either in series or in parallel, it is probably justifiable to conclude that ammonia requires ionic impacts of considerably more violence to decompose it than those required by nitrous oxide.

J. C. McLennan, R. Ruedy, and E. Cohen: The magnetic susceptibility of the alkali metals. Sodium, potassium, rubidium and caesium are paramagnetic and not diamagnetic.

C. F. Elam: Tensile tests on alloy crystals (4). Experiments have been made on the distortion of crystals of a copper alloy containing 5 per cent. aluminium. Like the brass crystals already investigated, these slip for a longer period on one octahedral plane than would be expected from geometrical considerations. A cored structure does not appear to affect the slip-plane and the direction of slip, but the annealed crystal is harder than the un-annealed. In the early stages of deformation copper is harder, and hardens more rapidly for the same amount of shear than either of the alloys, but both the final breaking load and the elongation are higher in the case of the alloys.

D. W. Dye: A magnetometer for the measurement of the earth's vertical magnetic intensity in C.G.S. measure. The instrument consists of a Helmholtz coil system set up with its axis truly vertical. When the appropriate current traverses the coil system, the vertical component of the earth's field is exactly neutralised. The resultant field is horizontal and directed along the magnetic meridian. This condition is indicated by the help of a small vibration detector. The detector consists of a small and very light flat coil free to vibrate about a horizontal axis normally lying approximately in the plane of the magnetic meridian. The plane of the coil is vertical and the axis of vibration horizontal. The coil is traversed by a relatively large alternating current at its resonant vibration frequency. Under these conditions it is very sensitive to a vertical field. The condition of rest of the coil corresponds to a zero vertical field. The sensitivity is equivalent to about 1γ . The complete installation enables a measure of vertical intensity in C.G.S. units to be realised to an absolute accuracy of about 2γ . Baseline values should be realisable to a reproducibility of 0.5γ .

G. W. C. Kaye and W. F. Higgins: The thermal conductivities of certain liquids. The thermal conductivities of a number of common liquids have been determined by a 'plate' method, over a range of temperatures up to 200° C. The test layers had an area of about 20 sq. cm. and thicknesses up to 0.5 mm. The following table summarises the chief results:

Liquid.	Conductivity at 20° C.	Temp. coeff. a.
Water	0.0014 ₉	+ 0.001 ₂
Glycerine	0.00068 ₀	+ 0.0005 ₃
Castor oil	0.00043 ₃	- 0.0005 ₀
Aniline	0.00041 ₂	0.0000
Olive oil	0.00040 ₂	- 0.0003 ₅
Cylinder oil	0.00036 ₆	- 0.0004 ₁
Transformer oil	0.00032 ₁	- 0.0006 ₂
Medicinal paraffin	0.00030 ₀	- 0.0000 ₇
Paraffin oil	0.00029 ₈	- 0.0005 ₅

THEORETICAL PHYSICS.

H. Levy and A. G. Forsdyke: The vibrations of an infinite system of vortex rings. In a previous paper the stability was examined of an infinite system of equal vortex rings situated in parallel planes with their centres evenly spaced along an infinite line and with their planes at right angles to that line. Instability was found to occur for disturbances confined to displacements of the centre of each ring along the central axis, the filament of each ring still remaining circular. The investigation is now extended to deformation of the vortex filaments. Conclusions are drawn regarding natural modes of vibration of the system; it is found, for example, that for any given ratio of radius of ring section to radius of ring there exists a critical ratio of ring spacing to radius, separating the region of stable oscillation from that of instability.

L. Rosenhead: Resistance to a barrier in the shape of an arc of a circle. The method is based upon the transformation introduced by Levi-Civita in 1906, and the approximation process used by Brodetsky. The value of the thrust and its line of action are obtained for barriers of both concave and convex camber, and for various angles of incidence. From these figures curves are plotted, from which the thrust for any particular camber and any possible angle of incidence can be obtained by interpolation. The results are interesting for the following reasons: (a) As the angle of incidence decreases, the centre of pressure, in the case of small concave cambers, moves

forwards until it reaches a maximum forward position, and then moves backwards. This is more marked the smaller the camber. (b) The effect of camber on the resultant thrust is much more marked with small angle of incidence than with large angle of incidence.

C. V. Raman and K. S. Krishnan: A theory of electric and magnetic birefringence in liquids. The local polarisation field acting on any molecule must depend on its orientation. The Langevin-Born theory is accordingly modified so as to take this 'anisotropy' of the polarisation field also into account and the modified expression for birefringence is in better accord with facts. As a rule the effect of the 'anisotropy' of the polarisation field is to diminish the magnitude of the birefringence to be expected, due to the fact that, in general, the longer linear dimension of a molecule tends to be also the direction of maximum electrical and optical susceptibility. The distribution of the molecules in a dense fluid therefore tends to be such that their mutual influence is equivalent to an apparent diminution in the anisotropy of the molecules.

E. T. Whittaker: On electric phenomena in gravitational fields. It is a consequence of general relativity that when electromagnetic phenomena of any kind take place in a gravitational field, they are influenced by the field; that is to say, the Maxwell's equations of the electromagnetic phenomenon must be replaced by other equations which involve the gravitational curvature of space. Two kinds of gravitational field are here considered, namely: (1) the field due to a single attracting mass and (2) a limiting case of this, which is called a *quasi-uniform* field: within these gravitational fields, electromagnetic phenomena are supposed to take place. The mathematical solutions of a number of problems correspond to well-known solutions in the classical Maxwellian theory. The results of the investigation are for the most part expressible only in terms of Bessel functions and of certain new functions which are introduced: but in some interesting cases the electromagnetic phenomena can be represented in terms of elementary functions, as for example the electric field due to an electron in a quasi-uniform gravitational field, and the spherical electromagnetic waves of short wave-length about a gravitating mass.

W. R. C. Coode-Adams: The refractive index of quartz. The characteristic frequencies in dispersion formulæ can now be obtained from the formula for optical rotation and applied to an equation of the Ketteler-Helmholtz type.

Physical Society, Oct. 28.—W. N. Bond: The theory of liquid flow through cones. An approximate general solution is given of the hydro-dynamical equations for liquid flow through conical tubes of circular section, the errors due to the approximation being small for converging cones of small angle and for flow through similar diverging cones up to the speed at which the theory predicts turbulent motion. **H. P. Walmsley:** The structure of the smoke particles from a cadmium arc. Using the powder method of X-ray analysis, the particles dispersed in air from a cadmium arc are found to be isometric crystals of cadmium oxide. From X-ray data, a density of 8.16 was obtained for the primary particles in the smokes: the normal density of cadmium oxide. Photometric measurements of the breadth of the lines showed that the primary crystals were of colloidal dimensions, values of 5.8×10^{-6} cm. and 4.9×10^{-6} cm. being obtained in two cases. On aggregation, the ultramicroscopic crystals grow along binary axes of symmetry, *i.e.* they tend to unite on their 110 faces.

PARIS.

Academy of Sciences, Oct. 24.—The president announced the death of **St. George Greenhill**, and **E. I. Fredholm**, *correspondants* of the Academy.—**E. Goursat:** A problem of Hamburger.—**G. Bigourdan:** A means of improving the determination of time.—**Camille Matignon and Mlle. Germaine Marchal:** The action of calcium magnesium, and aluminium on beryllia, heating a mixture of beryllia and metallic calcium in a vacuum at 800° C., the beryllia is partially reduced, from 30 to 33 per cent. of the theoretical proportion of metal being found. Substituting magnesium for calcium, some beryllium is still produced but in smaller proportion. With aluminium the reduction is doubtful.—**H. Douvillé:** The Cretaceous in the Bigorre region: its breccias and conglomerates.—**Léon Guillet:** The addition of nitrogen to special steels. Experimental results on the effects of heating in ammonia aluminium-chromium steels and nickel-chromium-aluminium steels, with special reference to the changes in hardness and elastic properties. The brittleness produced in certain steels by this treatment, known as 'Krupp's disease,' can be ameliorated by the addition of molybdenum in small proportions.—**Emm. de Margerie:** Report on the state of publication of the "Œuvres géologiques de Marcel Bertrand."—**A. Bigot:** Monasterian and post-Monasterian formations of Basse Normandie.—**D. Mirimanoff and R. Dovaz:** Repeated trials and the formula of Laplace.—**Widder and Gergen:** A generalisation of a theorem of Mandelbrojt.—**Georges Valiron:** The coefficients of the usual Taylor's series.—**W. Sierpinski:** Some properties of projective ensembles.—**N. Lusin:** Remarks on projective ensembles.—**Emile Borel:** Remarks on the notes of Sierpinski and Lusin.—**J. Grialou:** Weir with a thin wall; calculation of the yield.—**D. Riabouchinsky:** A problem of variation.—**Elie Carafoli:** A general method for drawing aviation profiles.—**Pierre Vernotte and Marcel Pellegrin:** The measurement of the thermal conductivity of metals. The method of the point of stationary temperature. A modification of the method of Kohlrausch.—**Pierre Bricout:** Quantitative study of the luminescence of mercury vapour excited by electronic bombardment. Measurements were made of the intensity of the radiation $\lambda 2536$ when the energy of the exciting electrons was varied from 3 to 86 volts. Starting with simple hypotheses, an expression is deduced for the law of resonance of the non-ionised atom. This is shown to be in good agreement with the experimental data.—**G. P. Arcay and M. Fallot:** Remarks on the determination of the coefficient of magnetisation of certain liquids. Using the method of Sève two classes of liquid were observed; in one group, including collodion, glycerol, castor oil, and other oils, under the influence of the magnetic field (12,000 to 13,000 gauss) the new level was rapidly assumed and remained fixed; the other group, including solutions of gelatine, gum arabic, albumen casein, and gelatinous silica, presented an anomaly, the first rapid change of level being followed by a slow change, due to a slow increase in the magnetisation coefficient. This effect is probably due to the rigidity of the liquids.—**Salomon Rosenblum:** The slowing down of the α -rays by matter.—**Pierre Jolibois and Henri Lefebvre:** A new reaction of active nitrogen. Carbon monoxide under low pressure is slightly decomposed by strong sparks. The rate of production of carbon dioxide is increased seven times if the gas is diluted with pure nitrogen. The authors explain the phenomenon by assuming a catalytic action of active nitrogen in the course of reversion

to normal nitrogen.—P. Lasareff and V. Lazarev : The absorption spectra of borax glass coloured with copper salts. The borax glass was examined in two forms, one suddenly and the other gradually cooled. The absorption spectra were identical, but differed from that given by copper sulphate in solution. It is concluded that the coloration of the borax glass is not due to copper ions, but is produced by complex compounds of copper and borax.—C. Grard and J. Villey : The thermal conductivity of the light alloys. Magnesium with 4 per cent. of copper has both mechanical and thermal characteristics superior to those alloys of aluminium and copper commonly employed.—Albert Roux : The control of welds by the magnetic spectra.—Brutzkus : The calculation of gas analyses. In many technical reactions a certain gas mixture, submitted to a chemical treatment, is analysed before and after the treatment. For the interpretation of the results it is necessary to determine the quantities of gas which have disappeared in the course of the treatment without knowing the total quantity. The solution of this problem is given.—B. Bogitch : Some improvements in the electrical fusion of poor minerals. A description of a modification of the type of electric furnace employed.—J. Thoulet : A double circulation of the ocean, deep and superficial.—Marcel Mascré : The fixation of the chondriome of the plant cell. A comparative study of the effects of various fixing liquids containing formol with acetic, cyanacetic, monochloroacetic, or trichloroacetic acid. It is shown that the acidity (pH) is not the only factor.—R. Herpin : A case of incubation by the female in *Leptonereis glauca* which swarms on the surface.—Pierre P. Ravault : Histochemical researches on the distribution of lime in the wall of the normal human aorta.—Mme. Andrée Roche and Jean Roche : Researches on the existence of the lactacidogen in the blood.—Mme. Anna Drzewina and Georges Bohn : The influence of the walls of vessels on the reactions of animals.—Edouard Chatton and André Lwoff : The evolutive cycle of *Synophrya hypertrophica* (ciliated Fœttingeriidae).

VIENNA.

Academy of Sciences, July 11.—R. Weiss and G. Schlesinger : Action of organic magnesium compounds on *o*-phthalonitrile. Müller and A. Salerwald : New synthesis of 1, 6-dibrom-*n*-hexane and its action on *p*-toluol-sulphamide.—A. Kailan and A. Blumenstock : The rate of saponification of stearo-lactone with alcoholic alkali solution.—A. Kailan and L. Olbrich : The oxidation of hydrocarbons by air. Experiments were made with paraffin and naphthalene at 183° and with toluol at 99°.4, passing the oxygen through these substances at various rates and for varying lengths of time with and without catalysers. Thus when 600 litres of air was passed through 100 grams of paraffin in 100 hours, 8 per cent. of the residuum was changed into saponifiable constituents.—W. J. Müller : The anodic behaviour and passivity of nickel.—A. Köhler : Ore-containing rocks of the Lower Austrian forest quarter. Exposures were examined near Marbach and elsewhere in the Danube valley. Chemical analyses are given of quartz-syenite-porphry, mica-diorite-porphryrite, hornblende-diorite-porphryrite.—M. Blau : Radium Institute Communication, No. 208. The photographic action of H-rays.—B. Karlik : Radium Institute Communication, No. 209. The dependence of scintillations on the nature of the zinc sulphide and the character of the scintillation process.—W. Schmidt : The thermo-plummet (*Wärme-lot*), an instrument for recording the temperatures of depths in standing waters.

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Official Publications Received.

BRITISH.

- Transvaal University College, Pretoria. Bulletin No. 12: Rainfall and Farming in the Transvaal. Part i: A Preliminary Investigation into the Variability of the Rainfall of the Transvaal, by Prof. F. E. Plummer; Part ii: Rainfall in relation to Agriculture in the Transvaal, by Prof. J. D. Leppan. Pp. 63+17 maps. (Pretoria.)
- The Quarterly Journal of the Geological Society. Vol. 83, Part 3, No. 321, October 20th. Pp. 845-550+plates 24-42. (London: Longmans, Green and Co., Ltd.) 7s. 6d.
- Aeronautical Research Committee: Reports and Memoranda. No. 1098 (Ae. 277): The Distribution of Pressure over a Monoplane and a Biplane with Wings of Unequal Chord and Equal Span. By A. S. Batson, A. S. Halliday and A. L. Maidens. (A.3.1. Pressure Distribution, 14.—T. 2406.) Pp. 28+13 plates. 1s. 3d. net. No. 1100 (Ae. 278): Wind Tunnel Experiments on the Effect on the Maximum Lift of Withdrawing and Discharging Air from the Upper Surface of an Aerofoil. By W. G. A. Perring and Dr. G. P. Douglas. (A.3.a. Aerofoils-General, 177.—T. 2470.) Pp. 5+7 plates. 6d. net. (London: H.M. Stationery Office.)
- Biological Reviews and Biological Proceedings of the Cambridge Philosophical Society. Edited by H. Munro Fox. Vol. 2, No. 4, October. Pp. 285-396+vil. (Cambridge: At the University Press.) 12s. 6d. net.
- University of Cambridge: Solar Physics Observatory. Fourteenth Annual Report of the Director of the Solar Physics Observatory to the Solar Physics Committee, 1926 April 1—1927 March 31. Pp. 8. (Cambridge.)
- Proceedings of the London Mathematical Society. Second Series, Vol. 26. Pp. ii+558. (London: Francis Hodgson.)
- The Dioptric Bulletin. Edited by John H. Sutcliffe. Vol. 29, No. 9, September: The Transactions of the British Optical Association. Pp. 395-645. (London: British Optical Association.)
- Bulletin of the Madras Government Museum. New Series, Natural History Section, Vol. 1, No. 1: The Littoral Fauna of Krusadai Island in the Gulf of Manaar; with Appendices on the Vertebrates and Plants. By various Authors. Pp. v+196+26 plates. (Madras: Government Press.) 8 rupees.

FOREIGN.

- Report of the Oceanographical Investigation. No. 2: Report of the Current Observations. The First Report, Results of the Current Measurements in the Adjacent Seas of Työsen, 1923-1926. Pp. iv+68+32+50+ii+20 plates. (Fusan, Chosen: Government Fishery Experimental Station.)
- Scientific Papers of the Institute of Physical and Chemical Research. No. 70: Effect of Combined Fat and Vitamin A Deficiency on Growth and Organ Weight of Albino Rats. By Waro Nakahara and Yasuko Yokoyama. Pp. 68-78. 25 sen. Nos. 71-72: The Crystal System of α -Thallium, by Genshichi Asahara and Toshiwo Sasahara; The Crystal Structure of α -Thallium, by Toshiwo Sasahara. Pp. 79-94+plates 13-17. 40 sen. No. 73: Studio pri Magnezijsklorida Cemento per X-Radio. De Tutomu Maeda. Pp. 95-102. 30 sen. No. 74: On the Nutritive Value of Fats and Lipoids. By Katsumi Takahashi. Pp. 103-132. 50 sen. Nos. 75-76: La Akva Vapopremo de Magnezijsklorida Cemento, kaj la Stato de Akvo en Ghi, de Tutomu Maeda; La Malnoligo de Magnezijsklorida Cemento, kaj la Funkcio de Libera Akvo, Kristalokvo kaj Adsorbata Akvo, de Tutomu Maeda. Pp. 133-154. 40 sen. No. 77: On the State of the Moisture adsorbed on Acid Earth. By Hajime Isobe. Pp. 155-190+plates 18-20. 60 sen. No. 78: On the Behavior of 2,6-Dioxyquinoline obtained from β -Acid of "Roh-Oryzann" upon the Pneumonia of Pigeon. By Yoshikazu Sahashi. Pp. 191-200. 20 sen. No. 79: On the Anomalous Dispersion and Absorption of Electric Waves. By San-ichiro Mizushima. Pp. 201-248. 60 sen. Nos. 80-83: The Radio-activity of the Rubidium extracted from the Lepidolite and Zinnwaldite of Japan, by Satoyasu Iimori and Jun Yoshimura; Lepidolite from Nagatori, Chikuzen Province, and the Lithium Content of Japanese Mica, by Satoyasu Iimori and Jun Yoshimura; Alkali Metals in Beryl from Ishikawa, Iwaki Province, by Jun Yoshimura: The Determination of the Helium Content of some Japanese Minerals, by Jiro Sasaki. Pp. 249-260. 20 sen. No. 84: New Method for Measuring the Cutting Force of Tools and some Experimental Results. By Masatosi Okochi and Makoto Okoshi. Pp. 261-302+plates 21-26. 150 yen. (Tokyo: Iwanami Shoten.)
- Department of the Interior: Bureau of Education. Bulletin, 1927, No. 24: Rural School Supervision. Abstracts of Addresses delivered at the Second Conference of Supervisors of the Southeastern States held at Raleigh, North Carolina, December 6 and 7, 1926. Pp. vi+58. 10 cents. Bulletin, 1927, No. 26: Trends in the Development of Secondary Education. By Eustace E. Windes. Pp. ii+41. 10 cents. Washington, D.C.: Government Printing Office.)
- The Semi-Centennial of the Hokkaido Imperial University, Japan, 1876-1926. Pp. iv+210+4 plates. (Sapporo.)
- Department of Commerce: Bureau of Standards. Scientific Papers of the Bureau of Standards, No. 558: An Analysis of the Arc and Spark Spectra of Scandium (Sc I and Sc II). By Henry Norris Russell and William F. Meggers. Pp. 329-373. (Washington, D.C.: Government Printing Office.) 20 cents.
- The Rockefeller Foundation. Annual Report 1926. Pp. xiii+466 (31 plates). (New York City.)
- Suomen Geodeettisen Laitoksen Julkaisu: Veröffentlichungen der Finnischen Geodätischen Institutes. No. 9: Relative Bestimmungen der Schwerkraft auf den Dreieckspunkten der Südfinnischen Triangulation in den Jahren 1924-1925. Von U. Pesonen. Pp. 129. (Helsinki.)
- Svenska Hydrografisk-Biologiska Kommissionens Fyrskapsundersökning år 1926. Pp. 41. (Göteborg: Elanders Boktryckeri A.-B.)
- United States Department of Agriculture. Technical Bulletin No. 21: Beaver Habits and Experiments in Beaver Culture. By Vernon Bailey. Pp. 40+14 plates. 20 cents. Technical Bulletin No. 15: The Citrus Insects of Japan. By Curtis P. Clausen. Pp. 16. 5 cents. (Washington, D.C.: Government Printing Office.)