Early Science at the Royal Society.

September 27, 1662. The president communicated a letter sent by his majesty to the duke of Ormonde, lord-lieutenant of Ireland, recommending the Royal Society for a liberal contribution from the adventurers and officers of Ireland for the better encouragement of the said society in their designs. Whereupon it was ordered that a copy of the said letter should be taken; and the humble thanks of the society be returned to his majesty by Sir Robert Moray, for this great testimony of his royal favour.—The president was desired to return likewise the thanks of the society to Mr. Secretary Nicholas and Mr. Williamson, for their readiness to assist the society in the king's letters to Ireland without taking fees.

September 28, 1664. There was read a letter of Dr. Wallis to Mr. Oldenburg, giving an account of his having performed the task imposed upon him concerning Mr. Horrox's astronomical papers, by comparing the copies with the originals, and digesting all the several pieces into one body, and prefixing to it an epistle addressed to the president of the Society.—The secretary informed the Society that at Rome observations of Jupiter had lately been made with the new glasses of Campani, by means of which, six belts had been discovered in that planet, four of which had appeared more obscure, and two more clear than the rest of his body.—The secretary having also formerly written to his correspondents in France, to inquire into the truth of the odd experiment delivered by the jesuit Casati, in his book, intituled, "Terra machinis motu," and received an answer thereto by a person who had consulted the author of the book himself concerning the same, he communicated it to the Society; the substance of which was that the said Casati had not tried the experiment himself, but had seen it tried by a gentleman, named Don Innocenzo Conti, viz., that the liquor extracted out of a certain bismutum, and well rectified, when sealed up hermetically, and exposed to the moon, rose in the full, and fell in the new moon.

September 30, 1663. Mr. Palmer presented the Society, from Mr. Edward Diggs [Digges] with two sorts of silk, one coarse, the other fine, sent from Virginia, and made there; together with some written observations of Mr. Diggs' concerning silk-worms, and the making of silk, contrary to the received opinion thereof. Mr. Palmer was desired to return the Society's thanks to the presenter, and to let him know, how much they were pleased with his care and concern for improving of this manufacture; and how glad they should be to receive information, from time to time of the progress of it. Mr. Hill was desired to get the parcel of the coarser silk to be put into a stuff for a cover for the mace.

1674. Mr. Hooke reported, that upon his making the proposal of the council to Mons. Papin of twenty pounds a year certain for writing all letters for the Society, he had accepted the same.

October 1, 1662. Dr. Wren presented some cuts done by himself in a new way of etching; whereby, he said, he could almost as soon do a piece on a plate of brass, as another should draw it with a crayon on paper.—Dr. Merret read his paper concerning the planting and preserving of timber; together with his collection of those statutes, that have been formerly made by the parliament of England.

October 3, 1666. The lord bishop of Exeter being requested to communicate the observations of Jupiter's satellites made by Mr. Laurence Rooke in order to the calculating of tables of their motion, his lordship desired, that he might be put in mind of it by Mr. Hooke, and that he would purposely come to his library in Gresham College to look them out.

Societies and Academies.

LONDON.

The Institute of Metals (Autumn Meeting), September 9.—R. J. **Anderson** and E. G. **Fahlman**: A method for measuring internal stress in brass tubes. The method for measuring longitudinal internal stress is called the strip method, and is carried out by slitting a narrow strip longitudinally in a piece of tubing; for example, a strip 2·75 inches long and 0·10 inch wide in a 3·25 inch tube length; and then releasing one end of such a slit strip by cutting. Stress is indicated by the springing out of the freed end, and can be calculated from the modulus of elasticity of the material and the distance in movement of the freed end.—D. H. **Andrews** and J. **Johnston**: The application of the ideal solubility curve to the interpretation of equilibrium diagrams in metal systems. The method of plotting here discussed has not been applied previously to metal systems. In many systems the simple theory fits the observations better than had been anticipated, and may at least be used as a guide in criticising and simplifying experimental work.—Guy D. **Bengough** and R. **May**: Seventh report to the corrosion research committee of the Institute of Metals. The problem of corrosion is considered largely from the point of view of the "scale" of corrosion products which forms on the surfaces of such metals as copper, zinc, and brass immersed in sea-water. A large proportion of tube failures in modern condensers is due to local impingement of aerated sea-water; the rapid corrosion is due to the local removal of protective scale by the impinging stream. Certain types of preformed scales may be very resistant to this type of action. The occurrence of "dezincification" is due, not to bad mixing of copper and zinc in the manufacture of brass, but to the absence of arsenic from tubes. The electrolytic method of protection of condenser tubes generally gives negative results, but occasionally good results have been reported; these seem to be due to chance secondary effects particularly of the anode products. Corrosion of brass may be due to metal-ion concentration cells or oxygen-distribution cells. With high-speed water streams the metal-ion concentration cell may become the more powerful and render the metal anodic and severely corroded; deposits of sand, porous masses of corrosion products, etc., may cause oxygen distribution cells to become active and set up local corrosion, but the most rapid cases of corrosion seem to belong mainly to the former type. Sometimes the two types of action reinforce one another.—E. H. **Dix**, Jr., and A. J. **Lyon**: Comparative results on copper-silicon-aluminium and other aluminium alloys as obtained on separately cast specimens and specimens cut from a crankcase casting. Copper-silicon-aluminium alloy is particularly well adapted for complicated castings which do not require a large amount of machining. The casting properties of Alpax are similar, but it has a very low proportional limit and is inferior in this respect. Lynite 195 has uniform and desirable physical properties. The proportional limit is considerably above any of the alloys tested. The foundry practice, however, is more difficult for this type of an alloy. 8 per cent. copper-aluminium alloy is suitable for the general run of castings and can be cast in sections $\frac{3}{16}$ in. or more in thickness without much difficulty.—R. **Genders**: The extrusion of brass rod by the inverted process. Precautions are necessary to secure good surface, the method adopted for the present being the avoidance of entrance of the skin of the billet into the region of flow. The structure of the extruded rod does not show the concentric zones of

material varying in crystal size and physical properties often produced by the peculiar nature of the flow which obtains in the ordinary process. The rear portion of the rod is variable in structure and hardness from centre to outside, but in a continuous gradient. All possibility of "core" defect is excluded, and, if defects are allowed to arise, they will be visible on the surface of the rod.—D. **Hanson** and Grace W. **Ford**: Investigation of the effects of impurities on copper. Part II.—The effect of iron on copper. Solid copper will dissolve about 4 per cent. of iron at 1100° C., but the solubility at lower temperatures is much less. Within the limits of solid solubility, the electrical resistivity increases rapidly as the iron content is raised: hence iron is extremely deleterious in copper for electrical purposes. The tensile strength is raised by 2 per cent. of iron from 14·5 tons per sq. in. to about 20 tons per sq. in. The effect of heat-treatment is relatively small. Iron has no great embrittling effect.—Sir Thomas K. **Rose** and J. H. **Watson**: Experiments on the working of nickel for coinage. The experiments were made in order to determine the conditions in which nickel for coinage could be cold-rolled in the existing rolls at the Royal Mint. It was found impossible to prepare coins containing 99 per cent. nickel with 1 per cent. of manganese, magnesium, carbon, iron, silicon, etc., such as are manufactured with the aid of hot-rolling. By the addition of 2 per cent. manganese, however, castings can be prepared suitable for cold-rolling and conversion into coin. The coins consist of a solid solution, and accordingly resist tarnishing and corrosion equally well with those containing 99 per cent. or more of nickel, such as are in circulation abroad.

Official Publications Received.

Transactions of the Leicester Literary and Philosophical Society; together with Report of the Council for 1923-1924 and Annual Reports of the Sections. Vol. 25, 1924. Pp. 55. (Leicester.)

Far Eastern Association of Tropical Medicine. Transactions of the Fifth Biennial Congress held at Singapore, 1923. Edited by the Hon. Dr. A. L. Hoops and Dr. J. W. Scharff. Pp. 974+86 plates. (London: J. Bale, Sons and Danielsson, Ltd.) 40*s.* net.

Memoirs of the Asiatic Society of Bengal. Vol. 8, No. 2: The Prakrit Dhātv-ādeśas according to the Western and the Eastern Schools of Prakrit Grammarians. By Sir George Abraham Grierson. Pp. 77-170. (Calcutta.) 3.15 rupees.

The Rockefeller Foundation: International Health Board. Tenth Annual Report, January 1, 1923-December 31, 1923. Pp. xvii+158. (New York: 61 Broadway.)

Proceedings of the Academy of Natural Sciences of Philadelphia. Vol. 76: Studies in the Dermaptera and Orthoptera of Ecuador. By Morgan Hebard. Pp. 109-248+plates 5-10. (Philadelphia.)

Government of India. Department of Industries and Labour: Public Works Branch. Irrigation in India: Review for 1922-1923. Pp. iv+39. (Simla: Government of India Press.) 12 annas.

Forest Bulletin No. 58: General Volume Table for *Chir* (*Pinus longifolia*). Classified by Diameter (and Girth) and Height. By S. H. Howard. Pp. 14+3 plates. (Calcutta: Central Publication Branch.) 8 annas.

Report on the Danish Oceanographical Expeditions 1908-10 to the Mediterranean and Adjacent Seas. Vol. 2: Biology. H. 1: Medusæ. By P. L. Kramp. Pp. 67. (Copenhagen: Andr. Fred. Høst and Søn.)

The Hundred and Second Report of the Commissioners of His Majesty's Woods, Forests, and Land Revenues. Pp. 50. (London: H.M. Stationery Office.) 6*s.* 6*d.* net.

Prospectus of University Courses in the Municipal College of Technology, Manchester, Session 1924-25. Pp. 229. (Manchester.)

Meddelanden från Statens Skogsförsöksanstalt. Hälfte 21, Nr. 4: Några Norrländska Skogsföryngringsproblem II; Quelques problèmes relatifs à la régénération dans la Suède septentrionale II. Av Gunnar Schotte. Pp. 149-180. Hälfte 21, Nr. 5: Tallens och granens Kolsyreassimilation och dess Ekologiska Betingelser; Untersuchungen zur Ökologie der Kohlensäureassimilation der Nadelbäume. Av M. G. Stålfelt. Pp. 181-258. Hälfte 21, Nr. 6: Skogsinsekternas Skadegörelse under åren 1919-1921; Die Schädigungen der Forstinsekten in den Jahren 1919-1921. Av Ivar Trägårdh. Pp. 259-294. (Stockholm: Centraltryckeriet.)

Loughborough College, Leicestershire. Calendar, Session 1924-25. Pp. xiv+214+53 plates. (Loughborough.) 3*s.* 6*d.* net.

Transactions of the Institution of Chemical Engineers. Vol. 1, 1923. Pp. xv+120. (London: Abbey House, Westminster.)

Manchester Astronomical Society. Journal of the Sessions 1922-1924. Pp. 60. (Manchester.) 4*s.*

Growth in Trees and Massive Organs of Plants. Dendrographic Measurements, by D. T. MacDougal; The Growth Record in Trees, by Forrest Shreve. (Publication 350.) Pp. 116. (Washington: Carnegie Institution.) 1.50 dollars.

Department of Marine Biology of the Carnegie Institution of Washington. Vol. 20: American Samoa. Part 1: Vegetation of Tutuila Island; Part 2: Ethnobotany of the Samoans; Part 3: Vegetation of Rose Atoll. By Prof. William Albert Setchell. (Publication 341.) Pp. vi+275+37 plates. (Washington: Carnegie Institution.) 3.50 dollars.

The Vesuvius Eruption of 1906: Study of a Volcanic Cycle. By Frank A. Perret. (Publication 339.) Pp. 151+24 plates. (Washington: Carnegie Institution.) 4 dollars.

Natal Museum. Mammals, Series 1. 10 pictorial post cards and leaflet. Mammals, Series 2. 10 pictorial postcards and leaflet. (Pietermaritzburg.)

Year Book of the Michigan College of Mines, 1923-1924, Houghton, Michigan. Announcement of Courses, 1924-1925. Pp. 123. (Houghton, Mich.)

Department of Commerce: Bureau of Standards. Technologic Papers of the Bureau of Standards, No. 259: Saturation Relations in Mixtures of Sucrose, Dextrose, and Levulose. By Richard F. Jackson and Clara Gillis Silsbee. Pp. 277-304. (Washington: Government Printing Office.) 10 cents.

Bulletin of the American Museum of Natural History. Vol. 49, Art. 3: The Dermaptera of the American Museum Congo Expedition; with a Catalogue of the Belgian Congo Species. By James A. G. Rehn. Pp. 349-413. Vol. 49, Art. 4: Size-Variation in Pyrenestes, a Genus of Weaver-Finches. By James P. Chapin. Pp. 415-441. Vol. 49, Art. 5: Observations on *Colobus* Fetuses. By Adolph H. Schultz. Pp. 443-457. (New York.)

Marine Structures: their Deterioration and Preservation. Report of the Committee on Marine Piling Investigations of the Division of Engineering and Industrial Research of the National Research Council. By William G. Atwood and A. A. Johnson; with the Collaboration of William F. Clapp, of Robert C. Miller, and of H. W. Walker, H. S. McQuaid and Marjorie S. Allen. Pp. vi+534+14 plates. (Washington: National Research Council.) 10 dollars.

Diary of Societies.

SATURDAY, SEPTEMBER 27.

SCHOOL NATURE STUDY UNION (Anniversary Meeting) (at London Day Training College), at 3.—G. H. Gater: Address.

TUESDAY, SEPTEMBER 30.

INSTITUTE OF MARINE ENGINEERS, at 6.30.—J. Lamb: Marine Oil Engines, Practical Notes on Bearing Adjustment.

ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN, at 7.—Dr. G. H. Rodman: A Talk about Orchids.

WEDNESDAY, OCTOBER 1.

SOCIETY OF PUBLIC ANALYSTS AND OTHER ANALYTICAL CHEMISTS (at Chemical Society), at 8.—G. D. Elsdon and P. Smith: The Determination of Coconut Oil and Butter Fat in Margarine.—F. Knowles and J. C. Urquhart: A Preliminary Note on the Composition of the Fat of Goat's Butter.—Miss W. N. Nicholson and D. Rhind: The Quantitative Estimation of the Degree of Hydrolysis of Gallotannin by Tannase.—Miss M. B. Richards and W. Godden: The Pemberton-Neumann Method for the Estimation of Phosphorus.—W. S. Shaw: Application of "Formal Titration" to the Kjeldahl Method of Estimating Nitrogen.

THURSDAY, OCTOBER 2.

INSTITUTION OF MINING ENGINEERS (Annual General Meeting) (at British Empire Exhibition), at 11 A.M.—Dr. J. S. Haldane: The Values for which the Institution stands (Presidential Address).—Sir Josiah Court: Salt Treatment for Miners' Fatigue.—Prof. K. Neville Moss: (*a*) The Food Requirements of Coal Miners; (*b*) The Mechanical Efficiency of the Human Body during Work in High Air Temperatures; (*c*) The Physiological Standardisation of the Kata-Thermometer.—J. T. Storrow and J. Ivon Graham: The Application of Gas Analysis to the Detection of Gobfires.

ROYAL AERONAUTICAL SOCIETY, at 5.30.—Lt.-Col. H. T. Tizard: Common Sense and Aeronautics.

CHILD-STUDY SOCIETY (at Royal Sanitary Institute), at 6.—Miss Ida C. Ward: Speech Defects.

FRIDAY, OCTOBER 3.

INSTITUTION OF MINING ENGINEERS (Annual General Meeting) (at British Empire Exhibition), at 10.30 A.M.—E. Williams: Economics of the Coal-mining Industry.—R. L. A. Dron: The Valuation of Mines and Minerals, and the Relation of Income Tax to such Valuations.—Prof. D. Hay and R. Clive: The Ventilation of Mines.—E. L. Hann: The Rhymney Valley Compressed-air Installation.—S. Mavor: Problems of Mechanical Coal-mining.—F. S. Sinnatt and H. E. Mitton: The Preparation of Coal for the Market.

ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN, at 7.—Display of Exhibition Slides.

JUNIOR INSTITUTION OF ENGINEERS, at 7.30.—Prof. A. W. Bickerton: Explosions, Terrestrial and Celestial.

PUBLIC LECTURES.

THURSDAY, OCTOBER 2.

UNIVERSITY COLLEGE, at 2.30.—Sir Flinders Petrie: The Official Classes of Ancient Egypt.

FRIDAY, OCTOBER 3.

BEDFORD COLLEGE FOR WOMEN, at 11 A.M.—Miss Hosgood: The Netherlands.

UNIVERSITY COLLEGE, at 5.30.—Prof. T. Percy Nunn: The Scientific Interpretation of Nature.