also the lower industrial training suitable for the actual workers. These appear to be essential if any progress is to be made, but India has lagged behind in most industrial matters. The existing system of family industrial training from generation to generation, which finally merges into the "caste" system, might be worked upon as the groundwork of the lower industrial training; but the higher technical education has been entirely neglected, possibly because, as Mr. Tipple points out, higher or university education in India has largely fostered courses which provide persons mainly equipped for Government service as lawyers, clerks, etc., but not for practical pursuits. He also deplores the fact that education in Indian schools has been arranged to lead up to university education of a literary type. He suggests that an Indian secondary-school career, instead of ending with an examination which is intended as an "entrance" into the existing universities, should end with a "school final examination." In such a school final a varied preliminary training suitable for diverse careers, such as industrial, commercial, and trade pursuits, might be provided for. This reform has been strongly urged during at least the last twenty years, and is essential if India is to hold its own in industrial work. It is to be hoped that the Indian University Commission, which has been taking evidence in different parts of India for some months, will give a much-needed lead towards more practical forms of education in India in the future.

A COPY of the annual statement of the Rhodes Trust for 1916–17 has been received from the secretary of the trust. It is recorded that the war has interfered increasingly with the operation of the scholarship system. At the close of 1916 the American section of the scholarships was still barely affected; but on the entry of the United States into the war the difference between American and Colonial Rhodes scholars naturally ceased to exist. The trustees have decided to postpone for the present all further election to scholarships. This will not, however, interfere with the holding of the annual qualifying examination in the United States, or in Colonies where qualification is not obtained through affiliation of local universities with the University of Oxford. Altogether, there were in residence at Oxford for some part of the year eighty-five Rhodes scholars, of whom seventy-one were American and fourteen Colonial. Of the seventy-one Americans, the great majority are now serving in the United States Army. For 1917–18 there are at present eight Rhodes scholars in residence—six Colonial and two American. Of the six Colonials, five are medical students; and of these five, two have already seen service. Of the two Americans, one has returned from a year's ambulance work on the French front, and is temporarily engaged in Government work in the University chemical laboratory, while the other has been rejected, on medical grounds, for military service. In addition, one ex-scholar has returned after three years' military service in France, to complete his medical course. The scholarships set free under the Act of Parliament cancelling the German Rhodes scholarships have been allotted as follows:—One to the Transvaal; one to the Orange Free State; one to Alberta and Saskatchewan (which have hitherto had only one between them); and one to Kimberley and Port Elizabeth alternately (Kimberley to select in the first year). Fourteen scholars and ex-scholars have given their lives in the service of the Empire during the year, and others have won many military honours. Five scholars were admitted in the year to read for advanced degrees. The address of the trust is Seymour House, Waterloo Place, London, S.W.1.

SOCIETIES AND ACADEMIES.

LONDON.

Optical Society, April 11.—Prof. F. J. Cheshire, president, in the chair.—J. W. **French**: The balsam problem. For cementing optical parts together Canada balsam is almost invariably employed. Although starting or starring of the balsam layer, actual separation of the parts, or deformation of the optical surfaces frequently occurs, there is no appreciably better substance known. Optical parts may be combined with an air space between the surfaces, by optical contact with or without sealed edges, by optical welding, or by cementing. The disadvantages of the various methods were enumerated, the loss of light at transmission surfaces being particularly discussed. A considerable number of balsamed specimens of ages varying up to ten years had been opened and photomicrographs of the balsam layer were exhibited. In all cases there were fluid layers between the harder balsam and the glass surface, and the photographs demonstrated particularly the smallness of the adhesion to the glass. Specimens artificially produced were also exhibited. In many cases the age of the specimen was shown to be deducible from the configuration. So-called granulation of balsam was stated to be due to the action of moisture on the balsam surface. No trace of crystallisation of glass-quality balsam was found in any of the experiments, but a number of the photographed specimens showed definite right-angled fractures occasionally observed in torn gelatine films.

PARIS.

Academy of Sciences, March 25.—M. Paul Painleve in the chair.—A. de **Gramont**: The spectrum test for boron. The bands obtained in the Bunsen flame, with or without the addition of hydrochloric or sulphuric acid, are diffuse and insensitive; the use of the oxy-acetylene flame gives additional bands, but still diffuse. The lines of boron given by the condensed spark are characteristic and more delicate, and the presence of three lines only in the ultra-violet shown by Sir William Crookes is confirmed. The line $\lambda=2497{\cdot}82$ will just detect 1 in 100,000 of boron. Applications to metallurgy and mineralogy are given.—C. **Depéret**: An attempt at the chronological co-ordination of quaternary times.—S. **Lattès**: The repetition of rational fractions.—M. de **Pulligny**: Some values of the approximate quadrature of the circle.—G. **Claude**: The industrial preparation of argon. A method of fractional condensation and distillation of air is described by means of which a mixture is obtained continuously containing argon 75 to 80 per cent., nitrogen 1 to 2 per cent., the remainder being oxygen. The oxygen is readily removed by burning with the correct proportion of hydrogen.—M. **Travers**: The estimation of tantalum in its alloys with iron. The impure tantalic acid obtained by the usual method is freed from iron by fusion with caustic potash, and after igniting and weighing the tantalic acid, the silica still remaining is determined by volatilising the tantalic acid in a current of hydrochloric acid at 900° C.—F. **Zambonini**: The identity of shattuckite and plancheite.—A **Guébhard**: The notion of "geosynclinal."—A. **Polack**: Inversion of the Purkinje phenomenon in congenital hemeralopy.—Ch. J. **Gravier**: A new copepod, *Flabellicola neapolitana*, parasite of a polychetal annelid, *Flabelligera diplochaitos*.—L. **Binet**: The cerebral pulse in emotional states.

April 2.—M. Paul Painleve in the chair.—L. E. **Bertin**: Obituary notice on Lord Brassey.—P. **Appell**: The notion of fixed axes and of absolute movement.—P. **Termier**: Contributions to the knowledge of the

tectonic of the Asturias; the signification of the Arnao mylonites.—P. E. B. **Jourdain**: Demonstration of a theorem on ensembles.—L. **Schlussel**: The value of the accelerations and velocities of dynamical actions registered by the dynamometer.—A. C. **Vournasos**: A new metastable form of antimony tri-iodide. Pure glycerol at its boiling point dissolves 20 per cent. of antimony tri-iodide, and deposits it on cooling as an amorphous powder, a fourth metastable modification of this substance. At 172° C. it is completely transformed into the stable form of hexagonal crystals.—R. **Charpiat**: The glauconite sands of the Lower Lutetian, in the north-east of the department of the Marne.—A. **Lécaillon**: The manner in which *Psammophila hirsuta* captures and carries its prey, and the rational explanation of the instinct of this Hymenoptera. The sense of smell is suggested as the means by which the prey is detected.—A. **Durand**: Correlation between the phenomena of condensation and smell. The author gives reasons for the view that water vapour plays a part in the mechanism of smell.

BOOKS RECEIVED.

The Young Observer's Handbook. By W. P. Westell. Pp. 317. (London: McBride, Nast, and Co., Ltd.) 7*s*. 6*d*. net.

Carnegie Institution of Washington Year-Book, No. 16. Pp. xvi+358. (Washington: Carnegie Institution.)

Club Types of Nuclear Polynesia. By W. Churchill. Plates xvii+pp. 173. (Washington: Carnegie Institution.)

Forecasting the Yield and the Price of Cotton. By Prof. H. L. Moore. Pp. vi+173. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd.)

The Aviation Pocket-Book for 1918. By R. B. Matthews. Pp. xvi+362. (London: Crosby Lockwood and Son.) 6*s*. net.

Welfare and Housing. By J. E. Hutton. Pp. viii+192. (London: Longmans and Co.) 5*s*. net.

Carnegie Institution of Washington. Papers from the Department of Marine Biology. Vol. xii. Pp. v+258. (Washington: Carnegie Institution.)

The Interferometry of Reversed and Non-reversed Spectra. By Prof. C. Barus. Part ii. Pp. 146. (Washington: Carnegie Institution.)

European Treaties bearing on the History of the United States and its Dependencies to 1648. Edited by F. G. Davenport. Pp. vi+387. (Washington: Carnegie Institution.)

Applied Bacteriology. Edited by Dr. C. H. Browning. Pp. xvi+291. (Oxford Medical Publications.) (London: H. Frowde and Hodder and Stoughton.) 7*s*. 6*d*. net.

DIARY OF SOCIETIES.

THURSDAY, APRIL 18.

ROYAL INSTITUTION, at 3.—Present-day Applications of Experimental Psychology: Lt.-Col. C. S. Myers.
ROYAL SOCIETY OF ARTS, at 4.30.—Water Power in India: A. Dickinson.
INSTITUTION OF MINING AND METALLURGY, at 5.30.
LINNEAN SOCIETY, at 5.—Narrative of the Percy Sladen Expedition to Brazil in 1913, with Lantern-slides: Prof. J. P. Hill.
INSTITUTION OF ELECTRICAL ENGINEERS, at 6.—Overseas Distribution of Engineering Appliances: L. Andrews.
CHEMICAL SOCIETY, at 8.—Hugo Müller Lecture: The Old and the New Mineralogy: Sir Henry Miers.
MATHEMATICAL SOCIETY, at 5.

FRIDAY, APRIL 19.

ROYAL INSTITUTION, at 5.30.—The Use of Soap Films in Engineering: Major G. I. Taylor.
INSTITUTION OF MECHANICAL ENGINEERS, at 6.

SATURDAY, APRIL 20.

ROYAL INSTITUTION, at 3.—Musical Instruments Scientifically Considered Prof. E. H. Barton.

MONDAY, APRIL 22.

ROYAL SOCIETY OF ARTS, at 4.30.—Military Explosives of To-day: J. Young.
ARISTOTELIAN SOCIETY, at 8.—Behaviour as a Psychological Concept Prof. A. Robinson.
ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—The Transkei: Miss M. H. Mason.

TUESDAY, APRIL 23.

ROYAL INSTITUTION, at 3.—Barrow-Explorers: Prof. A. Keith.
ROYAL STATISTICAL SOCIETY, at 5.15.—The Industrial Position of Italy: Prof. Commendatore Attolico and Capt. F. Giannini.
INSTITUTION OF CIVIL ENGINEERS, at 5.30.—Annual General Meeting.
ZOOLOGICAL SOCIETY, at 5.30.—Report on the Deaths in the Gardens during the Year 1917: Dr. J. A. Murray.—Exhibition of Specimens Illustrating the Effects of Rickets: Prof. Wood-Jones.

WEDNESDAY, APRIL 24.

ROYAL SOCIETY OF ARTS, at 4.30.—Mental Effects of the War and their Lessons in Social and Medical Reconstruction: Sir Robert Armstrong-Jones.

THURSDAY, APRIL 25.

ROYAL SOCIETY, at 4.30.—Bakerian Lecture: Experiments on the Production of Diamond: Sir Charles Parsons.
ROYAL INSTITUTION, at 3.—Rheims Cathedral: Sir Isambard Owen.
INSTITUTION OF ELECTRICAL ENGINEERS, at 6.—Large Batteries for Power Purposes: E. C. McKinnon.

FRIDAY, APRIL 26.

ROYAL INSTITUTION, at 5.30.—Food Production and English Land: Sir A. Daniel Hall.
PHYSICAL SOCIETY, at 5.—Notes on the Pulfrich Refractometer: J. Guild.—The Accuracy attainable with Critical Angle Refractometers: F. Simeon.—Cohesion: Dr. H. Chatley.

SATURDAY, APRIL 27.

ROYAL INSTITUTION, at 3.—Modern Investigation of the Sun's Surface: Prof. H. F. Newall.

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