should be no necessity for this country to import a single ton of foreign steel. Before the war something like 2,500,000 tons of steel, in the form of slabs, blooms, and billets, were imported into this country annually, mainly from Germany.

But for success in this great undertaking cheap ore and fuel are essential, and these can be obtained, in face of the greatly augmented cost of labour and material, which is a legacy of the war, only by an all-round increase in efficiency, embracing capital, engineering, and labour—capital by the installation of up-to-date equipment, engineering by improved mining methods, and labour by an increased output per man per shift.

These are the pressing problems of the immediate future.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

LONDON.—The following appointments have been made:—At King's College: Mr. J. E. Barnard, lecturer in microscopy; Major J. Quinton, lecturer in mathematics; and Dr. W. Wilson, as whole-time senior lecturer in the department of physics. At Bedford College for Women: Mrs. Orson Wood, demonstrator in the department of physics; Miss Woodman, part-time demonstrator in the department of physiology. The chemical department of the college has been divided into the two departments of (*a*) organic chemistry and (*b*) inorganic and physical chemistry. The following appointments have been made to the staff of the new departments:—Mr. Crompton, head of the department of organic chemistry and director of the laboratories; Dr. Spencer, head of the department of inorganic and physical chemistry; Miss Vanderstichele and Miss Triffitt, demonstrators in the department of organic chemistry; Miss Crewdson, demonstrator in the department of inorganic and physical chemistry. At Goldsmiths' College: Mr. G. T. White, head of the engineering and building department.

The title of assistant professor of physiology has been conferred upon Dr. O. Rosenheim, of King's College.

OXFORD.—Mr. Julian S. Huxley, a scholar of Balliol from 1905 to 1909, and from 1913 to 1916 associate professor of biology in the Rice Institute, Houston, Texas, and Mr. Henry Clay, scholar of University College from 1902 to 1906, and author of "Economics for the General Reader," have been elected fellows of New College.

DR. A. W. STEWART, of the University of Glasgow, has been appointed to succeed the late Prof. E. A. Letts in the chair of chemistry in the Queen's University of Belfast.

THE late Sir Archibald D. Dawnay bequeathed for scholarships 5000 *l.* shares in the firm of Archibald Dawnay and Sons, Ltd., to the Royal Institute of British Architects, 5000 to the London County Council, 1000 to the South Wales Institute of Engineering, Cardiff, and 1000 to the Battersea Grammar School. The bequests will become operative after the death of Lady Dawnay.

APPLICATIONS for the William Julius Mickle fellowship, which is of the value of at least 200*l.*, must be made to the academic registrar of the University of London before October 1 next. The fellowship is open to both men and women, and will be awarded to a graduate of the University, resident in London, who has done most to advance medical art or science during the past five years.

APPLICATIONS are invited by the Joint Studentship Committee of the Empire Cotton-growing Committee of the Board of Trade and the British Cotton Industry Research Association for studentships from graduates desirous of continuing their studies on the living plant. The studentships are of the yearly value of about 150*l.*, and applications must reach the secretary of the British Cotton Industry Research Association, 108 Deansgate, Manchester, on or before August 27.

THE prospectus of university courses in the Municipal College of Technology, Manchester, for the session 1919–20 has now been published. The college offers systematic training in the principles of mechanical, electrical, municipal, and sanitary engineering; of architecture and the building trades; of the chemical industries and the textile industries; and of photography and the printing crafts. It possesses extensive laboratories and workshops equipped with full-sized modern machinery, tools, and apparatus, including not only machines of the types now in general use, but also machines especially constructed for demonstration, experiment, and original research. There is a generous provision of both entrance and post-graduate scholarships. Courses of post-graduate and specialised study and research are offered for a fourth year to students who have successfully completed the three years' course for a degree in the Faculty of Technology in the Victoria University of Manchester conducted in the college, or are otherwise deemed competent to enter upon them.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, July 21.—M. Léon Guignard in the chair.—J. **Boussinesq**: The existence of an approximate relation, pointed out by M. Carvallo for quartz, between the two rotatory and dispersive powers of bodies.—A. **Gautier** and P. **Clausmann**: The action of fluorides upon vegetation. Field culture experiments. The fluorine in these experiments was added in the form of amorphous calcium fluoride; it was found to be favourable to the growth of wheat, oats, carrot, broad bean, cabbage, pea, poppy, potato, and hemp. No effect was observed with barley, rye, bean, buckwheat, and mustard, whilst beetroot, turnip, and onion were prejudicially affected by fluorides.—P. **Sabatier** and A. **Mailhe**: The catalytic formation of alkyl chlorides, starting with the primary alcohols. A mixture of hydrochloric acid and alcohol vapour, passed over alumina heated to 370° to 450° C., gives the alkyl chloride mixed with the ethylenic hydrocarbon produced by the dehydration of the alcohol. Primary, secondary, and tertiary chlorides may be formed in this reaction.—V. **Grignard** and G. **Rivat**: The addition compounds of halogen acids to diphenylarsenic acid. The addition products $[(C_6H_5)_2.AsO.OH]_2HCl$ and $(C_6H_5)_2.AsO.OH.HCl$ and two corresponding compounds with HBr were isolated and analysed.—G. **Giraud**: The classification of substitutions of certain automorph groups of n variables, and the algebraic relations which exist between any $(n+1)$ functions corresponding with certain of these groups.—M. de **Broglie**: The X-ray spectra of the elements. Measurements of the K spectrum of rhodium and L absorption spectrum of radium.—J. **Hebert-Stevens** and A. **Larigaldie**: Radiotelegraphy by infra-red radiation. The light from an arc projector is filtered through a screen which absorbs all the visible rays but allows a portion of the infra-red rays to pass. The receiver is a parabolic mirror with a sensitive thermo-couple placed at its focus, and the latter actuates a relay. Messages have been sent

over 20 kilometres with this apparatus.—S. **Posternak**: The synthesis of the hexaphosphate of inosite and its identity with the phospho-organic reserve principle of green plants. The ester was prepared from inosite and phosphoric acid in presence of an excess of phosphorus pentoxide. The yield is low, 3 to 5 per cent., and the substance is identical in all respects with the natural product from phytine.—R. **Levaillant** and L. J. **Simon**: The action of chlorosulphonic acid on methyl hydrogen sulphate. Methyl chlorosulphonate, $Cl.SO_2.(O.CH_3)$, can be isolated from the products of this reaction.—P. **Thiéry**: The geology of the region of Alais (Gard).—L. **Gentil**: The genesis of the forms of strata in chalk districts called *rideaux*.—S. **Stefanescu**: The teeth of elephants and mastodons.

CAPE TOWN.

Royal Society of South Africa, June 18.—Dr. J. D. F. Gilchrist, president, in the chair.—Miss Ethel M. **Doidge**: South African Microthyriaceæ. This group of fungi has been recently revised by von Hohnel and Theissen and others, and the characters of the family Microthyriaceæ have been more clearly defined. A short account of the genera represented in South Africa, and descriptions of species in the Cryptogamic section of the Union Mycological Herbarium, Pretoria, are given.—C. L. **Herman**: Note on carbolic acid as a fixative for histological preparations. Carbolic acid in 5 per cent. solution was found a most efficient fixative for histological purposes. It has been used since 1912 for all organs, including the central nervous system. For the thyroid gland it is especially good, as it gives thorough fixation of the colloid without shrinking or distortion. It acts by precipitating the protein without, however, entering into combination with it. It rapidly penetrates all tissues, especially the nervous tissue, and fixes both the cytoplasm and the nucleus without distortion or alteration. The optical differentiation becomes very good, and all cell-structures are found well and clearly defined. Staining is facilitated, and all stains are readily taken up.—J. R. **Sutton**: A contribution to the study of the diamond macle, with a note on the internal structure of diamond. The first part of this paper describes the aspect and characteristics of macles from various South African diamond mines, and gives statistics showing that the standard thickness to which macles tend to conform is almost exactly one-half that of the perfect octahedron standing upon an equal face. The so-called "twinning plane" is not necessarily a true plane at all, but rather an irregular surface. Bultfontein Mine is remarkable for the large number of irregular twins it produces and the small percentage of macles. In the second part the author discusses the "grain" of diamonds, as revealed by broken macles and by broken simple crystals, in which the fracture lies in a dodecahedral plane of symmetry, and deduces therefrom the primary cubical structure. The points of agreement and disagreement with the structure deduced by Bragg (by means of X-ray research) are indicated. Three orders of cleavage are shown, *i.e.* parallel to the faces of the octahedron, cube, and rhombic dodecahedron respectively.

BOOKS RECEIVED

Strawberry Growing. By Prof. S. W. Fletcher. (The Rural Science Series.) Pp. xxii+325+xxiv. plates. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1917.) 1.75 dollars.

A Large State Farm: A Business and Educational Undertaking. By Lt.-Col. A. G. Weigall and Castell Wrey. Pp. xiii+82. (London: John Murray, 1919.) 2*s*. 6*d*. net.

The Flower and the Bee: Plant Life and Pollination. By J. H. Lovell. Pp. xvii+286. (London: Constable and Co., Ltd., 1919.) 10*s*. 6*d*. net.

Utility Ducks and Geese: Their Successful Management for Egg and Meat Production, with Brief Notes on Some Ornamental Waterfowl. By J. W. Hurst. Pp. 93. (London: Constable and Co., Ltd., 1919.) 2*s*. 6*d*. net.

The Farmer and the New Day. By K. L. Butterfield. Pp. ix+311. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1919.) 8*s*. 6*d*. net.

The Fauna of British India, including Ceylon and Burma Coleoptera, Chrysomelidæ (Hispinæ and Cassidinæ). By Prof. S. Maulik. Pp. xi+439. (London: Taylor and Francis, 1919.)

The Cactaceæ: Descriptions and Illustrations of Plants of the Cactus Family. By N. L. Britton and J. N. Rose. Vol. i. (Publication No. 248.) Pp. vii+236+xxxvi. plates. (Washington: The Carnegie Institution, 1919.)

The Iron and Steel Industry of the United Kingdom under War Conditions: A Record of the Work of the Iron and Steel Production Department of the Ministry of Munitions. By Dr. F. H. Hatch. Pp. xii+167. (London: Privately printed for Sir John Hunter by Harrison and Sons, 1919.)

The North Riding of Yorkshire. By Capt. W. J. Weston. Pp. viii+161. (Cambridge: At the University Press, 1919.) 2*s*. 6*d*. net.

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