

glass, fertilizers, etc.—ought to be treated in such courses, and crude drugs, essential and fixed oils, and petroleum, are products closely allied commercially to chemicals about which the student should know something. A series of lectures on the chemical markets—how chemicals are sold, containers, insurance, fire risks, sales contracts, etc.—might well be delivered by some sales manager or broker familiar through daily, practical experience with this subject. Supplementary courses in applied economics, such as given in many of the larger universities on banking and finance, commercial law, traffic and transportation, business administration, advertising, and even actual salesmanship, might to advantage be offered to the students of commercial chemistry.

A definite and very real need for men with technical training in chemistry as applied to commerce exists and, as yet, there has been no systematic, serious effort on the part of our colleges and universities to supply this demand. Young men equipped with this training would find places in the most highly paid branch of industry open to them, and institutions giving this training would increase the scope of their chemistry departments. Moreover, to supply the American chemical industry with technically trained merchandizing experts will strengthen a "key industry," necessary to national prosperity and, in event of war, essential to national preservation.

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NEW YORK CITY

SCIENTIFIC BOOKS

The Physical Chemistry of the Metals. By RUDOLPH SCHENCK, Professor of Physical Chemistry in the Technischen Hochschule in Aachen. Translated by REGINALD SCOTT DEAN, Research Metallurgist, American Zinc, Lead and Smelting Company. New York. John Wiley and Sons, Inc. 1919. VIII+239 pages.

It is surprising that this book published in Germany in 1908 should have escaped the eye of the translator until now. It is, however,

most encouraging to the future of American industry to find the translator connected with one of the large metallurgical plants. Usually texts which deal largely with theoretical subjects are translated by college men for use in their classes and find their way into the practical field only indirectly. It is, therefore, doubly welcome to see a translation emanating from an industrial plant.

The book deals very largely with principles, but is eminently practical for the metallurgist. The chapter headings: I. Properties of Metals; II. Metallic Solutions and Alloys; III. Alloys of Metals with Carbides, Oxides and Sulphides, Iron and Steel, Mattes, Phase Rule; IV. Metallurgical Reactions, Oxidation and Reduction; V. Decomposition of Carbon Monoxide, Blast Furnace Process; VI. The Reactions of Sulphides give a good idea of the subject matter contained in the book. All of this material is essential to the well-trained metallurgist, but particularly that in the last four chapters. Each subject is treated briefly, but clearly and special emphasis is laid upon equilibrium phenomena and the factors which influence equilibrium. The reactions between carbon and oxygen and metallic oxides receive the full attention they deserve.

With the many merits which the book has it is surprising that it has some simple faults which might easily have been corrected. As examples might be mentioned the following: the omission of the eutectic lines in the diagram on page 51; the form of curves 1, 2, and 4 in diagram on p. 50; the inadequacy of the treatment of Crystal Growth on p. 20; the synonymous use of the terms martensite and austenite; the use of the term sorbitic as applied to chilled cast iron. These are, however, unimportant and it is hoped and believed that the book will be a distinct help to American metallurgists.

H. F.

SPECIAL ARTICLES

THE DEVELOPMENTAL ORIGIN OF THE NOTOCHORD

THE notochord is so constant, fundamental and distinctive a structure in the Chordate