CHEMISTRY IN THE AGRICULTURAL COLLEGE

PROFESSOR COPELAND in a recent article in SCIENCE[1] on "Botany in the Agricultural College" states as a minor point that much of the chemistry taught in these institutions is not basic to work in agriculture.

It may be interesting to note in this connection that we have found in this laboratory that it is possible to give freshmen, in a required course in chemistry, work which has relation to agriculture and seems to be of interest to them.

The work is synthetic rather than analytic or descriptive in character, and consists, in part, in preparation from the original sources of the following materials: superphosphate, ammonium sulfate (from gas liquor), high grade muriate and sulfate of potash, as well as the sulfate of potash-magnesia from crude salts, arsenate of lead, lime-sulfur, Bordeaux mixture, Paris green and various emulsions.

A student spends one or more two-hour laboratory periods on one preparation, often using the product of one day's work to make a second substance. For example, copper sulfate is made from metallic copper, and at a following exercise Bordeaux mixture and Paris green are made from the copper salt. Similarly lead nitrate is made from the oxid before the nitrate is used to prepare the arsenate of lead.

Many of these preparations, in the making, furnish excellent opportunities to illustrate the principles of mass-action and some phases of colloidal chemistry.

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THE RENOUNCING OF HONORARY DEGREES

TO THE EDITOR OF SCIENCE: In your issue of October 2, I notice certain German professors have stated their intention of renouncing the honorary degrees conferred upon them by British universities. If they imagine they can do this they are, as regards Cambridge, imagining a vain thing. Our statutes, which are acts of parliament, give no power, even to the authorities of the university itself, to take away honorary degrees.

The utmost the German professors can do is to cease to use them, but they will still remain honorary doctors of Cambridge. They will go down to the tomb with this indelible stain upon their names.

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[1] September 18, 1914, page 401.

SCIENTIFIC BOOKS

Telegraphy. By the late SIR W. H. PREECE, K.C.B., F.R.S., and SIR J. SIVEWRIGHT, M.A., K.C.M.G. Revised and partly rewritten by W. LLEWELLYN PREECE. London and New York, Longmans, Green and Co., 1914. 422 pages, 269 illustrations. Price $2.25 net.

This interesting volume in the Text-Book of Science Series is a thorough revision of a smaller volume of 300 pages by the same two authors published by Longmans, Green & Co. in 1876. Although the original volume passed through nine editions, its contents remained almost unchanged. At that time, the book was practically the only one on the subject of telegraphy in Great Britain available for operators and artisans employed in the British post-office system. Great changes have naturally taken place in that system during the 38 years which have passed since the book first made its appearance. The new book has, for instance, to include telephones and telephony, neither of which is referred to in the original edition. On the other hand, it has been necessary to exclude, for want of space, some of the subjects dealt with in the original volume.

In clearness and simplicity of statement, it would be difficult for the new edition to improve upon the old. All the writings of the late Sir William Preece were signalized by their directness and lucidity. His collaborator, Sir James Sivewright, was entitled to a like share of praise for his literary presentations. Between them they wrote a volume that remained, during a generation, a standard for

the class to whom it was addressed. The traditions of the volume have been well supported by Mr. Llewellyn Preece, Sir William's son. While many of the original illustrations have been preserved and reproduced in the new edition, more than a hundred new illustrations have been incorporated.

It is so rarely that we find a man's scientific and literary production adequately brought up to date by the labor of his son, that the book before us would have a claim for recognition on this account alone.

In view of so much new material which has been introduced, it seems invidious to complain of omissions. It is to be regretted, however, that the last chapter of the original edition, devoted to "Commercial Telegraphy" and dealing with the very interesting and special administrative features of the British telegraphs, should have had to disappear, in making up the new volume. There was a characteristic quality in that presentation which we think will be missed in the new edition, and which is valuable to students of telegraphy.

The new chapters on Repeaters, Quadruplex, Multiplex, the Telephone and Wireless Telegraphy are excellent, and the treatment which they offer of those subjects accords remarkably well with the style of the original volume.

A. E. KENNELLY

A History of Japanese Mathematics. By DAVID EUGENE SMITH and YOSHIO MIKAMI. The Open Court Publishing Company, Chicago, 1914. Pp. vii + 288.

This interesting story of Japanese mathematics is presented in most attractive garb. The paper, the type and the illustrations make of it a work which it is a delight to handle, but an American must feel some regret that this beautiful book with the imprint of an American publishing house is nevertheless from the press of a German printer, W. Drugulin, Leipzig.

The Japanese mathematics is largely indigenous and, as the authors well state, it is "like her art, exquisite rather than grand." Of the six periods into which the history of their mathematics may be divided the first extends to 552 A.D., and is almost entirely a native development. The second period, from 552 to 1600, was characterized by the predominance of Chinese mathematics. The third period was a kind of renaissance which reached its highest development in Seki Kowa (1642–1708), the most famous Japanese mathematician. The fourth and fifth periods, from 1675 to 1775 and from 1775 to 1868, are marked by the development of the *wasan,* or native mathematics. Even before these periods the Jesuits had secured a foothold in China, and a Japanese student of mathematics was working under Van Schooten in Leyden as early as 1661, so that some influence of European mathematics may be confidently assumed. The sixth period is the period of the present day which, in mathematics, at least, knows nothing of political and racial boundaries.

The uncertainty of the first and second periods is best illustrated by the fact that but 17 pages are devoted to their consideration. A passage in the discussion of the Chinese "Arithmetical Rules in Nine Sections" is also significant: "If these problems were in the original text, and that text has the antiquity usually assigned to it, concerning neither of which we are at all certain, then they contain the oldest known quadratic equation."

Tangible arithmetic seems to have secured its greatest development among the Japanese. The fundamental operations with the *soroban,* a modification of the Chinese *swan-pan,* are explained in a detailed manner, and illustrated with excellent photographs. Certainly it is striking that in Chinese *swan-pan* has the meaning "reckoning table," which corresponds precisely to the Greek word from which "abacus" is derived, this also having the meaning "table," particularly for bankers. The *sangi,* or computing rods, are explained both as used for representing numbers and also as applied to the solution of algebraic equations.

Extensive numerical computation appealed greatly to the Japanese as well as to the Chinese mathematician. The game side of mathematics is represented by magic squares, and even magic circles. An approach to the meth-