

little judicious skipping, however, the book may be suited to ordinary class use. It is well written, very intelligible, pleasant reading, and mathematically sound (except in § 88). An interesting feature is that the use of the sine and cosecant in solving triangles, finding areas, &c., is explained before the definition of the cosine and secant, and similarly the applications of the cosine are given before the tangent and cotangent are introduced. The contents of chapters ix. and x., with the exception of an isolated section on inscribed and escribed circles, might well be left to a more advanced treatise. The diagrams throughout are excellent. Demoivre's theorem and similar theoretical developments are not included.

#### OUR BOOK SHELF.

(1) *Mining Tables*. By Dr. F. H. Hatch and E. J. Vallentine. Pp. viii+200. (London: Macmillan and Co., Ltd., 1907.) Price 6s. net.

(2) *The Weights and Measures of International Commerce*. Tables and Equivalents. Pp. 59. (London: Macmillan and Co., Ltd., 1907.) Price 2s. 6d. net.

IN the former of these works the authors give a comparison of the units of weight, measure, currency, and mining area of different countries, together with tables, constants, and other data useful to mining engineers and surveyors. In the second work, they reprint a selection of tables that appeal to others besides mining engineers. On the whole, the authors have carried out their difficult task in an admirable manner. It is customary for engineers to get together data for use in their professional work, and the reprint of the authors' collection cannot fail to be of service to other workers in the same field. All such collections have, however, their limitations, as the requirements of no two engineers are precisely the same. We miss, for example, information relating to the strength of materials, tables for converting kilograms per square millimetre into tons per square inch, and the like, and in the table of rates of exchange for money, any reference to Spain, Portugal, or the South American republics.

While it is easy to point to omissions, we have not been able to detect any errors in the figures given, notwithstanding a careful comparison, for example, of the tables for the calculation of heights and distances from tachometer readings with the similar tables communicated by Mr. Neil Kennedy to the Institution of Civil Engineers in 1890. In the text, typographical errors are few. There is a little want of uniformity in the spelling of the names of metric weights and measures, grammes and grams, metre and meter, litre and liter being used indiscriminately. Barbados is spelt incorrectly; and Mohs, the inventor of the scale of hardness, appears as Moh. On the title-page, too, Dr. Hatch describes himself as member of the Institute, instead of Institution, of Civil Engineers, and Mr. Vallentine as member of the Federated Institute of Mining Engineers, a society which dropped the term Federated in 1897, and has since been known as the Institution of Mining Engineers.

*Les Aciers spéciaux*. By L. Revillon. Encyclopédie scientifique des Aides Mémoires. Pp. 188. (Paris: Gauthier-Villars, n.d.) Price 2.50 francs.

To understand even the present state of general knowledge with regard to special steels a very large and difficult field must be traversed, and the task of condensation to a reasonable limit will be a heavy one, but, for those who are unable from various causes to enter the field and would like to know the

kind of work that is being done, this book may be helpful. To compare the results given with one's own ascertained tests of materials made under known conditions would be a considerable task, but a few general matters taken at random are worth noting as examples.

On p. 99 we are told that chrome steels are chiefly made in the crucible, even when large pieces, &c. What can the author think would prevent them being made in the open hearth? They are so made in large quantities. On p. 154, the author permits himself to dream that nickel chrome steels may also be made in the open hearth (they are made extensively) as nickel steels and chrome steels are (which seems to contradict p. 99). P. 118, "Vanadium remains a scientific curiosity . . . excepting for steels of high price such as tool steels." It was a source of great pride to the late Auguste Wiener that he had obtained the recognition of vanadium as an element of practical industrial importance in the manufacture of special structural steels, and Kent-Smith's success in making vanadium chrome and vanadium nickel steels was the main reason why he was taken to America, undoubtedly to carry on similar work.

One regrets to find in a work on this subject, where names are freely used, that the only mention of Prof. Arnold, who has done so much in connection with nickel, vanadium, and chrome steels, is in chapter xv., on nickel vanadium steels:—"There exist also several tests by Prof. Arnold." Perhaps there is some kind of poetic justice in the fact that, to take one example only, the author's readers will not know that a nickel steel given by him at 61 tons per square inch, with an elongation of 3.5 per cent. on 100 mm., when properly made, gives the extraordinary test of about 90 tons per square inch and 10 per cent. elongation on 2".

A. McW.

*Voice Training in Speech and Song*. By H. H. Hulbert. Pp. xii+83. (London: W. B. Clive, 1907.) Price 1s. 6d.

THIS book is primarily designed for the use of teachers, who, as the author points out, are probably the greatest voice-users, but it will interest all who speak or sing in public. Voice production is difficult to teach even when the pupil has the advantage of performing exercises under the personal supervision of the instructor, and it may be doubted if much improvement in the use of the organs of speech can be effected by reading text-books alone; but what is possible in the direction of describing suitable exercises appears to have been accomplished with success by the author. The book provides an account of the structure and use of the vocal organs, and the means of securing distinct articulation; it should be useful to all persons who are attending practical classes for the cultivation of the voice.

*Revisio Conocephalidarum*. By H. Karny. Pp. 114. (Jena: Gustav Fischer, 1907.) Price 4.50 marks.

THIS compilation dealing with a subfamily of the Locustidæ, was published in the *Abhandlungen der k.k. zoologisch-botanischen Gesellschaft of Vienna*, and provides a serviceable continuation of the monograph prepared by Redtenbacher that appeared in the *Behandlungen* of the same society in 1891. Revised analytical tables are given for several of the genera to include recent determinations by the author and other workers. Three genera are here described for the first time—*Paroxyprora*, *Rhytidogyne*, and *Pœcilonerus*. A considerable number of new species are made, principally additions to the tribe of *Conocephalini*; many were collected in South America, and six were obtained in New Guinea.