

Seventh. Dr. Dudley offered to furnish to each member of the committee, a like amount of borings from a sample of Bessemer steel of from, 0.10 to 0.12 phosphorus, carbon about 0.50, manganese 0.80 to 1.00, silicon 0.02 to 0.05, sulphur 0.07 to 0.10 and copper from 0.07 to 0.10. These samples of steel to be used in deciding various questions that may come up in regard to proposed methods.

A very earnest feeling was manifested at the meeting of the sub-committee, and the outlook for some good work, is apparently very favorable.

APPROVED:

CHAS. B. DUDLEY,

J. W. LANGLEY,

*Chairman Sub-Committee.*

*Chairman Com. on Int. Standard.*

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### NEW BOOKS.

A MANUAL OF PRACTICAL ASSAYING. BY H. van F. FURMAN.

The constantly increasing demands made on metallurgical chemists for rapid work makes the appearance of Mr. Furman's book very timely; for while there are numerous text-books on assaying, and complete treatises for the iron-works chemist, no work until this has so completely embodied the methods now in use by the chemists of the silver, lead, and copper smelters of the west, and it is for these especially that the book is written.

On this account it would seem more appropriate to have included technical analysis in the title, for while the term assaying may doubtless be properly used as meaning more than fire assaying, it can hardly be construed into covering the contents of this book, which contains methods not in common use, by the technical chemist at least, and which in actual practice would probably be looked up in more detailed and specialized works. It would, however, hardly be just to criticise the author for making his manual as complete as possible, providing good judgment is used in selecting the methods, which is the case in all but a very few instances.

Part I, which is introductory, and includes chapters giving useful details as to reagents, apparatus, blowpipe reactions, etc.,

contains a chapter on sampling worthy of special mention. This chapter gives a thorough description of both hand and mechanical sampling as applied to the crude material, and to the finished products of the smelter. When it is remembered that the value of all the subsequent work depends upon having a good sample to start with, it can easily be seen that a knowledge of this subject is of great importance. As those accustomed to smelter work know, inaccurate sampling, either real or supposed, is the source of constant disputes; and anyone not already familiar with the various methods can read this chapter with profit.

Part II describes the methods for the separate determination of all the elements which need be considered in a technical manual; including a very full description of the fire assay for gold, silver, and lead.

Of course in a limited space no review can be attempted of all the methods given in this part of the book; but in general it can be said, that while there are perhaps occasional details which could be advantageously modified, they are methods which have stood the test of actual use under the trying conditions of smelter laboratories, where rapidity is the first and accuracy the second essential.

Some of the methods given here, while in constant use in the west, have not received the attention they deserve at the hands of analytical chemists in general; most conspicuous of these are the methods of A. H. Low for zinc, of H. H. Alexander for lead, and of F. C. Knight for lead, when used with the skill coming from practice, and with a proper understanding of the conditions involved, these methods, while essentially rapid, give results of a high degree of accuracy; they have a place indeed in the first rank of volumetric determinations.

The student of technical analysis can safely accept the methods given in Part II as carefully selected and reliable, and rendered additionally valuable by the liberal use of foot notes in referring to the original sources of information.

Part III is devoted to the description of special assays and analyses. The most important chapters here of course are those dealing with subjects which come up with more or less con-

stancy in smelter laboratories and assay offices; such as the assaying of the different kinds of bullion and mattes, and the analysis of slags, and these the author has treated very satisfactorily. In addition, among somewhat miscellaneous matter, are chapters on the analysis of gases, water, phosphates, etc., which in the absence of the standard text-books on these subjects will furnish a guide for doing such work, although the practice of trying to do chemical work without the proper fundamental knowledge cannot be too strongly deprecated.

Part IV, the last, includes chapters on the writing of chemical equations and stoichiometry, which are good in themselves, but of doubtful usefulness in a book of this kind, unless, perhaps, they are considered chiefly as preparing the way for the final chapter on the calculation of lead blast-furnace charges; a subject of much importance, and one which the author, from his own experience, is well fitted to treat.

A copious and well selected set of tables concludes the volume.

In his expressed object to "fill \* \* the wants of technical chemists" the author has certainly succeeded quite well, perhaps even too well; for with a volume of condensed information at hand the race of "machine" chemists, with which the west is already overstocked, will probably be increased. For this evil some of the western technical schools are primarily to blame. So long as they see fit to give a student a certificate of competency as a chemist or assayer when his stock of knowledge consists of an assortment—well selected it is true—of rule-of-thumb methods, just so long will the demand for this kind of education exist; and Mr. Furman, I fear, has unintentionally made it easier to get. While his book will be most useful to the well-trained analyst who can use the methods with discrimination, it can also be made to answer the purpose of the mechanical chemist as well.

L. G. EAKINS.