

That section of the book dealing with the iron-carbon alloys is, as in the original German edition, far the most satisfactory; the treatment is clear and concise, although here also the latest developments are disregarded. A special word of praise is, however, demanded by the splendid photomicrographs with which this portion, and indeed the whole of the metallographic section, is illustrated. Both as regards the original photographs and the typographical reproduction, practical perfection has been attained—and, indeed, these photo-micrographs almost deserve the lavish setting of black margins and wide white spaces with which they are adorned.

The remaining portions of this volume, dealing mainly with inorganic acids, follow closely on the lines of the previous edition, and call for little special comment, except as regards the sections dealing with the estimation of carbon in steel. Here the simplest and most trustworthy of the available methods—that of direct combustion in oxygen—has not even been mentioned, while the various risks of error attaching to the other methods described are entirely ignored.

The perusal of the volume as a whole raises the question whether these large compilations really serve any useful purpose; they attain huge dimensions by endeavouring to cover the entire ground of technical chemistry so far as analyses and tests are concerned, and yet the treatment of each subject is limited and is liable to become one-sided and inadequate. It would seem that with the huge dimensions now attained by the various branches of the subject, the day of the general handbook has passed, and the era of the special monograph has dawned.

A HANDBOOK OF PHOTOTELEGRAPHY.

Handbuch der Phototelegraphie und Telautographie. By Profs. Arthur Korn and Bruno Glatzel. Pp. xvi + 488. (Leipzig: Otto Nemnich, 1911.) Price 28 marks.

THIS is a book which, by reason of its thoroughness and its exhaustive treatment of matters which bear upon the main subject, must be recognised as the standard work of reference on phototelegraphy for a long time to come. Such an immense amount of work has been done in this branch of telegraphy that the book must be regarded to a great extent as historical, for even Prof. Korn himself quickly rendered his own selenium apparatus obsolete by the rapid improvements effected in his telautograph.

The first chemical telegraph of Alexander Bain came really before its time, as although a suitable system has been based upon it for the transmis-

sion of half-tone photographs, half-tone photographs did not exist in 1843, when Bain started his experiments. Much of the apparatus for telegraphing pictures and photographs is, in fact, seen from Prof. Korn's work to have been the practical outcome of extensive experiments made originally for the purposes of ordinary word telegraphy.

The book is rendered of the highest possible practical value on account of the large number of diagrams and illustrations, particularly those relating to constructional points, and those who are to any extent conversant with the practical difficulties of picture-telegraphy may perhaps wish that still more space had been reserved for the discussion of the modern apparatus.

Perhaps the most interesting portion of the book is that relating to Prof. Korn's apparatus for transmission by means of selenium. This element is undoubtedly destined to find further uses in physical measurements, and the excellent work done by the authors in overcoming the inertia of selenium under the influence of light should prove of considerable value. The short chapter on photoelectric cells will, it is to be hoped, be made much fuller in a future edition in view of their important application to astronomical measurements; some data as to the constants of the cells prepared by Elster and Geitel would have been welcomed by many readers.

As will be seen from the reproductions of results obtained with Prof. Korn's telautograph, the amount of detail that can be obtained in a telegraphed picture is quite remarkable; the transmitter comprises a metal drum revolving under a stylus, the picture being drawn (or photographed in line) in insulating ink; this effects the interruptions of the current flowing through the telegraph lines, which are recorded by a special type of Einthoven galvanometer, the metal "string" of which is shifted on the passage through it of a weak current, the shift allowing a narrow beam of light to pass to the exposing box, where a synchronously revolving drum furnished with photographic paper is placed.

The systems or adaptations of Charbonelle, Berjeanneau, Belin, Thorne-Baker, and others are described, though the reader is not given an opportunity to compare their results with those obtained by the authors, and brief reference is made to the wireless experiments that have been carried out.

The book is thoroughly up to date, including references even to the new system of Prof. Tschörner, of Vienna, and will be found extremely interesting by the many people who are at the present time experimenting in the directions discussed.

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