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SUPERHEATERS.

Superheat, Superheating, and their Control. By William H. Booth. Pp. xv+155. (London: A. Constable and Co., Ltd., 1907.) Price 6s. net.

THE constant reiteration of one maker's name in the book before us is wearisome, and we are agreed that "Connected as the author is with the only type of superheater using water-control in inner tubes he is not unnaturally apt to favour that system somewhat" (p. 143). He does this to the extent of twenty-two full pages of illustrations, &c., out of the 155 composing the book, besides further references on nine more!

The author thinks regulation of the temperature of the steam most important, and mentions seven ways of accomplishing this end. Prof. Unwin, however, has expressed scepticism as to this necessity "*provided only the superheaters were properly placed*"; an opinion in which he was supported by the late Mr. Bryan Donkin.[1]

The author considers Lancashire and similar boilers suitable for combining with superheaters, but for "average water-tube boilers," whatever this may mean, and marine boilers he recommends separately fired superheaters.

The inventor of one of the most widely used superheaters, especially for locomotive work, is referred to as "one Schmidt," and *two* locomotives are stated to have been fitted with his system with good results! While crediting another system with having been fitted or ordered for 372 locomotives, he gives no description. Describing another in some detail, he says nothing of its performance, or, indeed, whether it is in use. Only two other superheaters are illustrated. Particulars of two tests only are given, made with "Cruse" and "Foster" superheaters respectively.

Although he works out the area of a "theoretical diagram" to one ten-thousandth of a square inch (!) the author is less particular about other matters. For instance, the specific heats of several of the substances in a table on p. 8 do not agree with those on p. 148. In a curious calculation on p. 16 he concludes that a pound of steam at 361° F. will raise 60 pounds of cast iron from 62° to 361°. Taking the value of the specific heat of cast iron =0·11, as given on this page (two other values are given elsewhere), 1973 B.Th.U.[2] are required to effect this. As each pound of steam can only supply 1192 B.Th.U., even if cooled to 32°, the author expects to get more heat out of the steam than it contains.

In attacking what he calls "The Leakage School" he is apparently unaware that serious leakage is usually only attributed to engines with flat slide valves; and not, therefore, to those designed for use with superheated steam. Captain Sankey has demonstrated in a masterly manner that properly designed piston valves are practically steam-tight.

On p. 29 the well-known expression $PV^{1\cdot065}$ is printed $PS^{1\cdot065}$; an unfortunate departure, as "S" has another meaning on p. 33. Another loose expression is the use of the term "thermometric" heat for a quantity measured in B.Th.U.

On p. 34, the first equation is hopelessly wrong. A formula at the bottom of the same page, for converting the actual evaporation of a boiler to its equivalent weight of water "from and at 212," is only correct if the steam is saturated and dry; yet we read on p. 46 "No boiler delivers dry steam."

Notwithstanding the author's statement that he "prefers not to write a book of the catalogue-compilation type," he has, in our opinion, failed to give any information which would be useful to a designer, or, indeed, to anyone but a prospective customer.

The publishers have produced the book in their usual excellent style, but there are one or two instances of American spelling which have apparently escaped the reader's notice.

[1] Proc. Inst. Mech. Engineers, 1896.

[2] (0·361°−62°)×0·11×60=1973.

A BAVARIAN TEXT-BOOK OF BOTANY.

Lehrbuch der Botanik für Oberrealschulen und Realschulen. By Dr. Th. Bokorny. I. Teil. Pp. vi+366. Price 4 marks. II. Teil. Pp. 223. Price 3 marks. (Leipzig: W. Engelmann, 1908.)

A REDEEMING feature of the large number of botanical text-books published during the last few years has been the freshness, in some cases the originality, of treatment which has from time to time characterised them. The volumes now under notice constitute a case in point. The reorganisation and extension of botanical teaching in the Realschulen and Oberrealschulen of Bavaria has rendered the existing text-books unsuited to the changed ideas, and in the present volumes Prof. Bokorny has produced a text-book which aims at directing, upon right lines, the efforts of those entrusted with the new teaching.

The author's treatment of his subject is of some interest to teaching botanists. The first section of part i., occupying nearly one-half of the volume, is concerned with a description, in almost non-technical but very direct language, of representative plant species from the phanerogams downwards, the flowering plants receiving by far the greatest attention. At convenient intervals in these descriptions the author deals with a topic of special interest—not necessarily bearing upon the preceding subject-matter—particular examples being the influence of soil conditions upon plant life, the relationships between plants and insects in the pollination processes, distribution of fruits and seeds, and the influence of light upon plant growth. An almost inevitable accompaniment of this system is a certain discontinuity of text which is occasionally striking, but there can be little doubt that the method should quickly arouse the interest of the student, and found it, from the beginning, upon an extended basis. The plants chosen for description are invariably such as should be familiar to students who are no longer beginners, and a welcome departure from established custom is the inclusion of plants of economic importance. The descriptions are largely concerned with floral characters, and are brief and well-written.

The first section of the book, together with an out-