

ELECTRIC POWER AND TRACTION.

Electric Power and Traction. By F. H. Davies. Pp. vi+293. (London: A. Constable and Co., Ltd., 1907.) Price 6s. net.

ELECTRIC power and traction is such an immense subject that it is rather a bold undertaking to deal with it in a small volume of 293 pages, even if the reader is supposed to know the elementary laws of electrical engineering. The book, however, does not pretend to be a regular text-book, but it is evidently intended for those whose knowledge of electrical engineering is limited, and to these as well as students it can be recommended.

Four chapters deal with the generation and distribution of power. The various systems of direct and alternating current are briefly discussed, and descriptions of typical installations are given. As the author briefly touches upon the subject of direct-current high-tension transmission, it is rather surprising that no mention is made of the Thury system, which has come into prominence during the last few years.

Two chapters are devoted to D.C. and A.C. motors, and their principles are expounded. In directing attention to the starting-up of induction motors, the author omits to mention the important method of changing from "star" to "delta" on the stator, which is used for most squirrel-cage motors up to 20 horse-power.

The chapters on the application of electric power are the best in the book, and the advantages of electric driving are clearly brought out. On p. 124 there appears a statement which shows that, in the author's opinion, the time is not far distant when the voltage for lighting ships will be raised to 200 or 240, but this prediction will not command universal assent. The modern tendency even on shore is to return to 110 volts, especially since the introduction of metallic filament lamps, and it seems more probable that 100 or 110 volts will remain the standard voltage for marine work.

The last ten chapters of the book are devoted to electric traction, and although one may find in them a few statements which are open to criticism, they contain a good deal of practical information. The conduit and surface-contact systems are dealt with, and the advantages of electric traction are briefly set out. Full details are given of the direct-current system in use on the Metropolitan, District and London tube railways. The benefits of "multiple-unit control systems" are briefly touched upon. In view of the prominence given to the Westinghouse control system, it is surprising that no mention is made of the British Thomson-Houston system, the more so as the latter is in use on nearly all the London tubes and underground railways.

In his remarks on substations the author, in dealing with motor-generators, has omitted to mention Bruce Peebles' motor-converters, which in recent years have come largely into use, notably on the Great Western Railway, where it is the standard equipment for all substations.

On p. 240 the novel statement appears that the middle rail on the Metropolitan and District railways

is not protected, "because it is practically at earth potential." Perhaps if the author would try it, by touching it, he might change his opinion.

The exposition of the *pros* and *cons.* of three-phase, single-phase, and D.C. systems is not absolutely convincing, because, to judge from the disproportionately numerous descriptions of single-phase locomotives, it would almost seem that the author has an unduly high opinion of this system. It might have been of interest if particulars had been given of the New York Central locomotives, as they represent the most recent practice in D.C. traction, and surpass anything that has been done, so far, with the single-phase system. The book is well printed, and illustrated by excellent photographs. It contains a good deal of sound practical information, and can be recommended to the class of readers for whom it is intended. L.C.

SCHOOL CHEMISTRY AND PRACTICAL ORGANIC CHEMISTRY.

The Complete School Chemistry. By F. M. Oldham. Pp. viii+416. (London: Methuen and Co., 1907.) Price 4s. 6d.

Practical Chemistry for Army and Matriculation Candidates. By Geoffrey Martin. Pp. viii+144. (London: Crosby Lockwood and Son, 1907.) Price 2s. net.

Systematic Practical Organic Chemistry. By G. M. Norman. Pp. viii+98. (London: W. B. Clive, University Tutorial Press, Ltd., 1907.) Price 1s. 6d.

A Course of Practical Organic Chemistry. By T. Slater Price and D. F. Twiss. Pp. xiii+239. (London: Longmans, Green and Co., 1907.) Price 3s. 6d.

A Scheme for the Detection of the More Common Classes of Carbon Compounds. By F. E. Weston. New edition. Pp. viii+95. (London: Longmans, Green and Co., 1907.) Price 2s. 6d.

MR. OLDHAM'S book provides a complete course of instruction for schools. He has had in view the London matriculation and the Army entrance examination, but has added important sections not included in either syllabus, which he says with a touch of irony "should be taught wherever a teacher is free from the trammels of an examination syllabus and need think only of giving sound instruction."

Judging from a general survey of the book, we are inclined to think that the syllabuses above mentioned were not altogether present in the author's mind when he wrote it, for sound instruction is certainly the keynote of his method.

Part i. especially is excellently arranged, clearly written, and admirably illustrated. If the school time admitted of it one could not devise a better course for the beginner in chemistry; but the standard eventually reached is far beyond that of any matriculation candidate, and one is doubtful if even three school years would suffice to cover the ground mapped out, unless, indeed, the experimental part were performed for, instead of by, the student, which would be a misfortune. The programme is an ambitious one; but we believe it is thoroughly sound, and if it could be