

*Power Station Efficiency Control: a Treatise for the Power Station Engineer on Boiler-Room Efficiency, Turbine-Room Efficiency, Heat Balance Control, Methods of Recording and Tabulating Operating Results and Keeping a Day to Day Check on Operating Efficiency.* By John Bruce. With an Appendix by R. H. Parsons. Pp. xiii + 244. (London: Sir Isaac Pitman and Sons, Ltd., 1924.) 12s. 6d. net.

IN the management of the boiler-house of power stations, great improvements have been made in recent years, with a consequent increase in the over-all efficiency of generation. All the coal used is now weighed with high accuracy. The temperature of the furnaces and of the flue gases is recorded and chemical analyses of the products of combustion are continually being made. The results are recorded, tabulated, and suitably analysed. The staff are always striving to improve their methods and are always ready to consider the possibilities of new inventions and of new fuels. Six years ago, the ratio of the heat equivalent of the kilowatts generated to the heat equivalent of the fuel consumed was commonly only about 10 per cent. To-day, thanks to scientific investigations, there are power stations in various places with a thermal efficiency of more than 18 per cent. Most of the improvement is due to increased efficiency in the boiler-house. The author asks the reader to look on this book as addressed to power station operating engineers, and states that it is not a highly technical treatise but a general talk on the salient factors influencing efficient operation. We can recommend the book to both students and engineers, as it gives a good introduction to many problems which engineers are successfully solving.

*The Microscope.* Part 2. An Advanced Handbook: a Sequel to "The Microscope, a Simple Handbook." By Conrad Beck. Pp. 231. (London: R. and J. Beck, Ltd., 1924.) n.p.

THIS book may be regarded as an advanced supplement to the author's simple handbook on the microscope, already noticed in these columns. It deals in particular with the optical theory of the microscope and on somewhat novel lines. What we would especially commend is the manner in which the reader is carried on from point to point with the use of simple geometrical diagrams and without reference to advanced mathematics.

In addition to the general optics of lenses, excellent chapters are introduced on microscopic photometry, resolution, and illumination. In the last named, dark ground illumination is dealt with and details are given of the Barnard special illuminator which permits of the use of objectives up to 1.27 N.A. In Chapter viii. various microscopes for special purposes are described, e.g. measuring, tank, dissecting, and research, also the Barnard appliance for testing rigidity by an interferometer method. The final chapter deals with polarised light and its various applications to the microscope.

The book is one to be recommended to the non-mathematical reader who desires to understand the optical theory of the microscope. Where Mr. Beck expresses views somewhat different from those current, he at least supports them with reasoned explanations and experiments.

*Elements of Electrical Design.* By Prof. Alfred Still. Pp. xxi + 535. (London: McGraw-Hill Publishing Co., Ltd., 1924.) 25s. net.

MANY problems connected with the design of electrical machines and apparatus are discussed in this volume. It is shown that in many cases sufficiently accurate solutions can be found by applying elementary mathematics and known physical laws. When designing high-voltage insulators, the reader is shown how to picture for himself the tubes of electrostatic induction in the insulator and the surrounding space, and when studying the action of electric generators and motors he pictures the conductors as cutting the magnetic flux. A concrete mental conception can thus be obtained of the actions which produce easily measurable results. The author points out that the difference between a laboratory course and a course in machine design is that the former is mainly concerned with analysis, separating out the losses in a machine, whilst the latter is concerned with synthesis, the building up of a machine. A course in design is a link between academic studies and practical engineering. It helps to develop engineering judgment, the student learning the relative importance of the many factors which enter into a commercial problem.

*A First Chemistry for Schools.* By W. H. Hewitt and S. T. E. Dark. Pp. viii + 316. (London: Methuen and Co., Ltd., 1924.) 5s.

THIS book consists mainly of directions for the carrying out of a large number of experiments by a class of boys. The results when discussed in class should provide excellent material on which to build a sound structure, though more discussion in the text would be welcome. Our curiosity, which is aroused on p. 28 by a reference to the "chemist's definition" of acids in Chapter ix., is unfortunately not satisfied, and the laws of chemical combination are dealt with somewhat casually in a chapter headed "Reduction, Oxidation." The book contains some good features, for example, hints on keeping a note-book, though the practice of copying original readings into a best note-book is to be deplored. Molecules are discussed before atoms. This unusual method of approaching what is probably the most difficult part of the subject for beginners is sound, but the necessity for using two distinct units is not clearly brought out, and some confusion may arise as to the difference between the "ultimate" particles called molecules and the "indivisible" particles called atoms.

*I principi della meccanica alla luce della critica.* By Giuseppe Casazza. Pp. 174. (Roma, Milano and Napoli: Albrighi, Segati and C., 1921.) n.p.

"A NEW assault upon the rock of crystallised ideas of the nature of force" is what the author claims for this book. One or two headings will suffice to show how weak are his conceptions and poor his standards of scientific value: "Carnot's Cycle (or the prettiest cycle of nonsense or contrasense that can be imagined)," "Astronomical Mechanics (or the greatest scientific joke that has ever appeared under the heavens)," "The Principle of Relativity (or a comedy full of laughter)." S. B.