

ought to be in the hands of every tool-room man in our machine shops; for, on a few pages, the author has set forth invaluable data, which a few years ago, was the carefully guarded secret of experts. The other, on "Wiring a House," is the best popular, yet exhaustive account of the latest methods of scientifically equipping a middle class house for incandescent lighting that we have seen. From an assumed 110 voltage, the author takes us step by step, through the methods of scientifically equipping a middle-class house for ing wireage, making joints, etc. If there is one thing we miss it is a chapter on illumination; indicating the precise number of lights required for a given-sized room, and specifying where and how they should be placed to give the most effective service. This, however, is perhaps asking for too much in a 25 cent pamphlet which, sticks closely to the text of "wiring," and is a valuable contribution to the literature of electric lighting.

Elementary Principles of Continuous-Current Dynamo Design.—By H. M. Hobart, B.Sc., M.I.E.E., Mem. A.I.E.E. Toronto: The Macmillan Company of Canada, Limited, 27 Richmond Street West; 6¼" x 9¼", pp. 220 (\$2 net).

As an addition to electrical literature for the student this work may be placed in the front rank. As indicated by the title, it is intended for the beginner, the author concluding that the reader understands the underlying principles of electricity and magnetism, and that he has some little knowledge of dynamo-electric machinery. It is not assumed, however, that he would be able to make calculations for even the simplest dynamo-electric machines.

From a careful survey of the book we find that it familiarizes one with the calculations which are part of a dynamo designer's daily practice. These calculations are set forth by graphic diagrams and formulæ, which the author has himself used. Illustrative calculations are shown, and the use of the diagrams and formulæ is comprehensively dealt with. The book contains seven valuable tables, and is profusely illustrated throughout. It would make a valuable addition to the library of any student in Electrical Engineering.

A Guide to Electric Lighting, for the use of householders and amateurs.—By S. R. Bottone. London: Whittaker and company, 2 White Hart Street, Paternoster Square. Canadian representatives, the Macmillan Company of Canada, Limited, 27 Richmond Street West, Toronto. Sixth edition, 1906. Size 7¼" x 5", pp. 226. 122 illustrations. (Price 1s. net).

This is perhaps, the best popular guide to electric lighting extant. The fact that it is in the 35th thousand is evidence that it has met a want. The data in chapter eight on the amount of illumination necessary for a given space, is new and valuable. The author says that "to light a room brilliantly there should be a 16 candle-power lamp to every 33 cubic yards of space, or a 20 candle-power lamp to every 40 cubic yards." An excellent table is given for the use of 10 candle-power lamps in rooms ranging from 15 to 72 feet square. It is also stated that "an arc lamp of 1,000 candle-power absorbing 10 amperes at 50 volts) is sufficient for 750 to 1,000 square yards in cotton mills, weaving mills, printing and bookbinding works;" and that "in engineering shops a similar lamp will afford sufficient light for 1,500 to 2,000 square yards, while in open spaces 1,000 candle-power will suffice for from twenty to thirty thousand square yards." The addition of a chapter on the diseases of electrical machinery would make this guide about perfection for its purpose. That the book is attaining wide popularity is not surprising, for although cheap it is thorough.

The Practical Engineer Pocket Book for 1907.—The Technical Publishing Company, Limited, 287 Deansgate, Manchester, England. 1s. 6d.

The 1907 edition of this valuable pocket book is very much superior to any previous issue, chiefly owing to the fact that the demand for the 1906 edition led to an enlargement to over 600 pages of comprehensive engineering data, which places it in the forefront of engineering pocket books.

The revision is extensive. Pages of doubtful interest to the general user have been omitted. The additions include notes on air pumps, suction gas plants, marine condensers, boiler setting, steam traps, engine governors, etc. Steam turbines are more fully dealt with, and the notes on engine-room accessories, cotton belting, and emery wheels have been added to.

Ice Formation, with special reference to Anchor Ice and Frazil.—By Howard T. Barnes, M.A.Sc., D.Sc., F.R.S.C., Associate Professor of Physics, McGill University, Montreal. New York: John Wiley & Sons; 9¼" x 6", pp. 250; 40 illustrations, \$3 net.

In view of the phenomenal eagerness just now to utilize the abundant water-power resources of the Dominion; and the important part ice plays in the problems involved in the designing and construction of hydro-electric plants, the publication of an authoritative and reliable work on the nature of ice formation, and of the precautions necessary to avoid the troubles and dangers caused thereby, in connection with mill-races, dams, intakes, and hydraulic works generally, can only be described as an important event.

There was a time when engineers in charge of river works dreaded the advent of winter frost and snows; for it meant a season of constant anxiety and care, lest some morning they should awake to find their hydraulic plant rendered idle by the mysterious action of anchor-ice, or frazil in the unseen river depths; or their engineering works damaged by erosion caused by massive ice flows, or even swept away by the bursting of some tremendous gorge.

Only recently Mr. F. W. Harbord, a famous British Mechanical Engineer, pronounced against the economic production of "White Coal" in Canada, on account of "change of seasons." The book will do very much to enlarge the knowledge of ice phenomena of Canadian engineers.

Dr. Barnes' work contains the most philosophical discussion, and at the same time the most practical data on frazil and anchor-ice yet presented to the scientific world. The importance of the problems dealt with may be gathered from the following extracts:—"The worst effects which are met with in engineering works are from frazil-crystals formed during extreme weather," and again—"The accumulated mass of frazil, though porous and saturated with water, is as effective an obstruction to the flow of a river, with respect to the area occupied by it, as so much rock. The obstruction it creates may be inferred from the fact that it compels so great a river as the St. Lawrence to back up in winter fifteen feet."

The brief, but luminous chapter on "Methods of overcoming the ice problem in engineering work," is worth the price of the book. The comprehensive scope of the work may be gleaned from the titles of the chapters: (1) Physical laws governing the transfer of heat. (2) Physical constants of ice. (3) Formation and Structure of ice. (4) Sheet, frazil and anchor-ice. (5) Precise temperature measurements. (6) River temperatures. (7) Theories to account for frazil and anchor-ice. (8) Methods of overcoming the ice problem in engineering work.

This timely and opportune work ought to have a wide circulation among Canadian engineers; especially among our younger men, for great engineering projects in the form of canals and hydraulic works are in contemplation. With the author, we believe that "a thorough understanding of the laws underlying the formation of ice will lead to methods . . . which will so temper the effects of ice in our northern rivers, as to render them no longer a bar to the full development and utilization of our vast water-powers."



SAFEGUARD FOR INK BOTTLES.

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