Our Bookshelf.

Hydraulics: a Text-Book covering the Syllabuses of the B.Sc. (Eng.), A.M.Inst.C.E., and A.M.I.Mech.E. Examinations in this Subject. (Engineering Degree Series.) By E. H. Lewitt. Pp. viii+261. (London: Sir Isaac Pitman and Sons, Ltd., 1923.) 8*s*. 6*d*. net.

THIS can scarcely be considered as a serious contribution to the subject of hydraulics. It is rather a digest prepared for students who have not much time or else have not the desire to peruse a subject of study seriously but rather under compulsion of some examination. No doubt such works are of assistance in somewhat the same way that a slide rule is of help in arithmetical calculations, but it is doubtful wisdom to substitute the slide rule for that mental training which arises from a study of arithmetical processes.

So much first-class work on the flow of fluids through pipes has been done during the last fifteen years, and laws of dynamical similarity have been so well confirmed by experiment, that it is surprising to find the flow of fluids in pipes dealt with in a manner that, so far as it goes, is clear, but from the educational point of view—particularly that of a university student upon whom future developments will largely depend—is treated in a manner that explains how certain formulæ can be used to calculate certain quantities but entirely avoids any sound discussion of the fundamental principles underlying fluid flow. The author states that for water flowing in horizontal pipes Reynolds "found that for velocities below two feet per second the loss of head is proportional to the velocity, whilst above two feet per second it is proportional to the velocity squared." Students will be led entirely astray by this statement.

No mention is made of the diameter of the pipe to which the velocities given by Reynolds refer, and it would appear that the author is unaware of the variation of the critical velocity with temperature and diameter of pipe. It is rather doubtful if the author has referred to the original papers quoted in connexion with critical velocity. The treatment of turbines and centrifugal pumps is distinctly scanty.

The book is what might have been expected from a good student making a précis for examination purposes from existing works, and will accordingly be valuable to those students who are fond of taking their studies in tabloid form.

Guide to the Plymouth Aquarium. By E. W. Sexton. Pp. 165. (Plymouth: Marine Biological Association, 1924.) 1*s*.

THE Marine Biological Association has done a great service both to itself and to the public by the issue of this attractive guide-book to its aquarium. The main body of the book is devoted to a brief survey, in scientific sequence, of all the marine groups of animals. The important structural features of each group are succinctly stated in non-technical language and the more interesting points in their bionomics are briefly described. The common name, where one is available, is invariably given as well as the scientific name. In the first portion of the guide the contents of each of the exhibition tanks and cases in the aquarium are listed, some salient feature, such as colour, given, whereby they can be readily identified and a reference made to the fuller account in the other part of the book. Mrs. Sexton is to be congratulated on the successful accomplishment of her share of the work.

Of the illustrations it may be said at once that they are admirable habitus figures of the animals they depict. We do not know of a better drawing of a living Aplysia than the one given here. Miss Brightwell has an excellent eye for the *tout ensemble* of a species, and, in spite of the want of colour, naturalists familiar with the shore fauna will recognise in her drawings the peculiar traits of form and structure, often insignificant in themselves, by means of which the animals are readily recognised in the field. On the other hand, the artist is not so happy in her backgrounds and foregrounds. The black background of several of the drawings is not pleasing, and the sea-bottom over which several of the animals (cf. Aplysia) are shown to be crawling is not natural, and detracts considerably from the real merit of the drawing of the animal itself. The guide is excellently produced and profusely illustrated.

La Physique depuis vingt ans. Par Prof. P. Langevin. (Encyclopédie scientifique.) Pp. 455. (Paris: Gaston Doin, 1923.) 15 francs.

IN the nine chapters of this volume, Prof. Langevin has collected a number of addresses and reports bearing dates from 1903 to 1920. In the first three he discusses the development of the electron theory and its applications. Then follows a chapter, dated 1913, on the quantum theory. The latter half of the volume is concerned with the nature of the concepts of space and time and the theory of relativity. It would seem that the reports are printed in the form in which they were first presented with no attempt to revise them in the light of more recent knowledge. Thus the author provides an interesting historical picture of the development of physical ideas in the first twenty years of the present century. But the picture is in many respects incomplete, and the reader would have welcomed an additional chapter pointing out what modifications are necessary in the earlier addresses to bring them into line with the results of modern work. For example, the ether, the existence of which is so confidently assumed in the first chapter, would require an entirely fresh description to bring it into accord with the Einstein theory of relativity, even if the conception is not to be abandoned entirely.

Elements of the Theory of Infinite Processes. By Prof. Lloyd L. Smail. Pp. vii+339. (New York and London: McGraw-Hill Book Co., Inc., 1923.) 17*s*. 6*d*.

PROF. SMAIL'S book forms a very satisfactory introduction to the theory of infinite series and products, and includes a discussion of the simpler transcendental functions. It also contains chapters on infinite determinants and infinite continued fractions, subjects on which there is only a scanty literature in English. No systematic introduction to the theory of irrational numbers is given, however; without this the arithmetical concept of a limit cannot be put on to a logical basis. The aim of the book is to present the funda-