

basis of design and construction, and by indicating the different ways in which these principles have been applied in practice.

The volume may, in fact, be regarded as a guide-book to what has been done, but its usefulness would have been enhanced if more frequent references had been made to the sources from which complete information on the different subjects could be obtained, or if a list of the works in which the subjects have been treated had been given at the end of each chapter. It is true that in such matters as harbours, docks and canals, with which the author is most conversant, the references from which the information is taken are plentifully given; but these are principally to the author's own works, and no mention is even made of the works on these subjects that have been published within the last few years in "Longmans' Engineering Series," of which this book forms part.

Besides a general introduction, the subjects are dealt with under five heads, and include (1) materials employed in construction; preliminary arrangements for carrying out work; excavation; dredging; pile-driving; cofferdams; foundations; piers of bridges; roads and street-paving. (2) Laying out and formation of railways; bridges; viaducts; tunnels; permanent way; light railways and tramways. (3) Control and regulation of rivers; canals and canalised rivers; ship canals; and irrigation works. (4) Docks, river quays, harbour works; lighting coasts and channels; land reclamation and coast protection. (5) Sanitary engineering, including water supply and sewerage works.

*Rural Reader—Senior.* By V. T. Murché. Pp. 292. Price 1s. 9d.

*The Teacher's Manual of Object Lessons for Rural Schools—Senior.* By V. T. Murché. Pp. xxiii+396. (London: Macmillan and Co., Ltd., 1902.) Price 2s. 6d.

THE schoolmaster in the country is just now very much in want of a text-book to guide him in giving that kind of instruction which is variously termed "nature knowledge" or "rural economy"; such elementary observation and reasoning applied to common things, as will stimulate the child's mind and yet serve as an introduction to agriculture or horticulture later. Mr. Murché was ready with two text-books very soon after the circular from the Board of Education in 1900, and now comes forward with two more for senior children, a reading book for school use and a parallel series of object lessons set out for the teacher's benefit.

The scope of the books is extensive enough—a little chemistry and botany, a few discourses on farming, then comes a considerable section on insect life, with chapters on fishes, reptiles, trees and ferns to the end. The get-up is excellent, nice type and plenty of pictures, so that any child will enjoy the varied course of the reader, and the teacher may get many excellent hints from the object lessons. But how fatally does the author miss the whole spirit of the work, which is to make the child see and think and find out things for himself. From beginning to end of the book the child is being told in dogmatic fashion scraps of information about natural objects of the most unequal degree of importance. The book is a typical compilation; in each subject the man who knows will detect, if not mistakes, yet that want of proportion, that emphasis in the wrong place, which mark the writer at second hand.

For example, on p. 63 the children are made to compare the flower of the Deadly Nightshade, *Atropa*, with the potato flower, to show them how a garden plant may have wild relations. In the first place, there is little superficial resemblance between the flowers, and *Atropa* is a really rare and casual plant in England, whereas every hedgerow contains the "Woody Nightshade," poisonous enough and with flowers that are unmistakably

the fellows of the potato flower. Again, we notice on p. 127 an account of the mole cricket, with a picture; how many collectors, not to speak of children, have ever found a mole cricket? And so the book goes on through the whole gamut of animated nature; our feeling in the end is one well known to examiners, "I suppose I must allow some marks for this, but—" We have not yet found the text-book for country schools, and we are afraid that Mr. Murché's is just a sufficiently middling substitute to block the way of the real article when it comes.

A. D. H.

*Poultry Management on a Farm.* By Walter Palmer, M.P. Pp. 94. (Westminster: Archibald Constable and Co., Ltd., 1902.) Price 1s.

THE object of this work is to show that poultry in considerable numbers can be kept on an ordinary farm with profit. Mr. W. Palmer, M.P., on land of about 200 acres, has established a poultry department. 350*l.* have been expended in buildings and the necessary appliances, a skilled manager with three assistants have been appointed, and the results of three years' work are very fairly given in this well-printed and well-illustrated, but very cheap, volume. Whether the results are such as will induce many other agriculturists to go into the pursuit or not may be regarded as doubtful, but the volume is well worthy the attention of those who are interested in the matter. Poultry farms pure and simple have long been known to be visionary, those institutions at present going under that name not being utility poultry farms, but places for the rearing and sale of fancy stock at fancy prices. Mr. Palmer is an enthusiast in his subject, and it is needless to say that his work presents the results of his experiments in the most favourable light, but this is obviously done with a good motive and in an exceedingly truthful manner. Many practical farmers would, however, object to his figures. Nothing is charged for the annual depreciation and wear and tear of the plant. The annual value of the manure of the two thousand birds is estimated at 100*l.* Moreover, the author states that if the ninety thousand farms in England were all to keep poultry on the plan recommended by himself, the profit arising from this source would be no less than four and a half millions a year to the British farmer. These statements will be differently estimated by different readers.

*Lectures on the Lunar Theory.* By John Couch Adams M.A., F.R.S. Edited by R. A. Sampson, M.A. Pp. 88. (Cambridge University Press, 1900.) Price 5s.

WE are glad to see that the famous lectures of Adams on the lunar theory have been published so as to be readily accessible to all. They have been well edited and most lucidly presented to the reader. Prof. Sampson naturally, however, did not feel at liberty to extend the subject-matter of the lectures, so that the work remains in a slighter form than Prof. Adams would, perhaps, himself have cared to publish it.

This being so, we are led to ask—What class of readers does this book specially cater for? We do not think the students, for the book cannot compete with Dr. E. W. Brown's treatise, nor would it be of any great value to the calculator who should wish to develop afresh correct expressions for the moon's coordinates, for the chief difficulties here consist in the correction of approximate solutions, a section to which only four pages (pp. 30-33) is devoted in the present work, and, moreover, the action of the planets is not considered. Perhaps, then, the class that will find this book most interesting are the astronomers, who from time to time want to refer to small portions of the theory and obtain numerical values for some of the quantities that occur. This was, perhaps, not the design of the work, but we can recommend it as serving this purpose thoroughly.