

certificate or matriculation range. For students following a school course it would be difficult to imagine a more efficient or attractive presentation of a subject which, thanks largely to the universal interest in wireless, may be regarded as the most popular branch of science, but is often handicapped by heavy or unimaginative treatment. The historical development is prominent throughout. This, as is nowadays generally realised, adds greatly to the reality and interest of science. Here, moreover, instead of the great pioneers being left as little more than names, they are made to 'live' by judicious sketches of their life and times, with portraits, numerous extracts from their original papers, and reproductions of their diagrams and apparatus. The lesser known experimenters receive due recognition, in which connexion Bennett's work and original illustrations are notable. Equally with the historical aspect a practical line of study is followed, aided by a wealth of simple diagrams and numerous ingenious and up-to-date modifications or improvements of the usual experiments. Practical applications to everyday life are emphasised.

The quantitative side has been made to appear integral with theory. Each chapter is provided with a summary, simple questions, and an ample number of questions grouped together, drawn from papers of the various school certificate authorities; worked numerical examples are added. A concluding chapter deals briefly with modern ideas and advances, such as conduction through gases, wireless, and photoelectricity. The book is altogether admirable—a maximum is accomplished in a minimum of space.

N. M. BLIGH.

*Electricity for Everybody: Handbook for 1931; an Electrical Compendium incorporating a Gazetteer of Electricity Supplies, a Directory of Electrical Contractors, and a Diary from April 1931 to March 1932.* By R. Borlase Matthews. Pp. lxxxvii + 470. (London: Electrical Press, Ltd., 1931.) 5s. net.

Now that electricity supply is available to many, a demand has arisen for accurate knowledge about the various uses to which this supply can be applied for domestic and factory purposes. This book will be useful in this connexion. It contains a useful diary, a calendar, and a section dealing with general principles which can be readily understood by anyone with a little technical knowledge. There is a section dealing with electric lighting, heating, cooking, and power in the home, due stress being laid on the economic and æsthetic factors. The costs of electricity in public and private buildings and in factories are discussed, and simple methods of computing them are given.

Mr. Borlase Matthews is a specialist in the many uses to which electricity can be put on a farm or in a garden. It is used to increase the comfort and hence the utility of live-stock. It also increases their productivity. The heating and lighting of apiaries increases the productivity of each hive by from 15 lb. to 17 lb. of honey per annum. Electric heating of greenhouses for forcing is very readily done, and an even temperature is easily obtained

by a thermostatic control. The soil heating of frames and hot beds by means of electric cables is extending in Great Britain. It is much better than using the variable heat given out by manure.

*Post-Primary Science.* By W. F. F. Shearcroft.

Book 1: First Year's Course. Pp. 194. (London, Bombay and Sydney: George G. Harrap and Co., Ltd., 1930.) 2s. 6d.

THIS is the first of three books designed to cover the first three years of a five-year course, leaving two years for a more specialised study. The object is to overcome the difficulty, so painfully obvious to every teacher, that science tends to be studied in water-tight compartments, and progress in one branch is hindered by ignorance of another, ending generally in a knowledge of a little heat and a little chemistry.

Here science is generalised in the extreme by a treatment of measurements, heat, light, sound, and magnetism and electricity, with a trace of mechanics, all merging into each other. The presentation is in the simplest possible style, and in a manner likely to interest pupils from the age of eleven years, for whom the book is intended. The scientific method is the keynote throughout, and the course, being primarily experimental, should certainly train the pupil to think. The provision of a table of contents would be an advantage, an index not being a satisfactory alternative.

N. M. BLIGH.

*An Introduction to Quantum Theory.* By Dr. G. Temple. Pp. 196. (London: Williams and Norgate, Ltd., 1931.) 12s. 6d. net.

THIS book is concerned more with the ideas upon which quantum mechanics is based than with the applications of the theory to physical problems. The book opens with a general discussion of the principle of duality between waves and particles, followed by a chapter on the theory of photons, in which the idea of a wave function for a single light quantum is introduced. A wave theory of matter is then developed along unusual lines. Electric charge is treated as a fluid which obeys hydro-dynamical laws, and by means of certain special assumptions its behaviour is shown to be governed by a wave equation equivalent to that of Schrödinger. Thus, without interpreting any of the symbols in terms of probability, a considerable number of the results of wave mechanics can be deduced, including the energy levels of a hydrogen atom and the splitting in a magnetic field. The treatment is complicated and involves a considerable amount of mathematics, and therefore can scarcely be recommended to a beginner.

The author then shows that it is necessary to introduce the idea of probability in dealing with collision problems, and in dynamical problems involving the interaction of two or more particles. There follow chapters on quantum algebra and matrix mechanics, attention being concentrated on the formal side of the theory, and very few examples being given. As would be expected from the author's own researches, there are interesting chapters on the relativity wave equation and on the spinning electron.