



A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE

"To the solid ground
Of Nature trusts the mind which builds for aye."—WORDSWORTH.

THURSDAY, NOVEMBER 3, 1904.

APPLIED ELECTRICITY.

- (1) *Wireless Telegraphy*. By C. H. Sewall. Pp. 229 (London: Crosby Lockwood and Son, 1903.) Price 10s. 6d. net.
- (2) *Electricity in Agriculture and Horticulture*. By Prof. S. Lemström. Pp. iv+72. (London: The Electrician Printing and Publishing Co., Ltd., 1904.)
- (3) *Modern Electric Practice*. Vol. iv. Edited by Magnus Maclean. Pp. viii+304. (London: The Gresham Publishing Co., 1904.)
- (4) *The Theory of the Lead Accumulator*. By F. Dolezalek. Translated by C. L. von Ende. Pp. xii+241. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1904.) Price 10s. 6d. net.
- (5) *Electric Motors*. By H. M. Hobart. Pp. x+458. (London: Whittaker and Co., 1904.) Price 12s. 6d. net.
- (6) *Notices sur l'Électricité*. By A. Cornu. Pp. vii+274. (Paris: Gauthier-Villars, 1904.) Price 5 francs.
- (7) *L'Année Technique (1902-1903)*. By A. Da Cunha. Pp. 303. (Paris: Librairie Gauthier-Villars, 1903.) Price 3.50 francs.

(1) **ALTHOUGH** wireless telegraphy is of such recent development, it is apparently regarded by many as a legitimate subject for historical writing. The first volume before us is one of several which have appeared in the last three or four years in which the historical progress of wireless telegraphy is dealt with rather than its scientific principles. The book possesses to our mind the same faults which characterise all the other similar publications which we have read; there is a lack of discrimination in the selection of material which is likely to leave the untechnical reader in a state of considerable confusion. Wireless telegraphy as we know it to-day is wholly concerned with Hertzian wave telegraphy, and even if accounts of the experiments of Lindsay and others in telegraphy by earth or water conduction should be regarded as legitimate, we

cannot see by what possible stretch of the imagination the achievements of, say, Marconi can be traced back to the prophecies of Galileo in 1632.

Mr. Sewall's method of compiling history appears to consist chiefly in making extracts from patents. Page after page of the book before us contains nothing more than reprints from the patents of Lodge, Marconi, Fessenden, and others, sometimes verbatim in inverted commas, at others with slightly altered context as original matter. We imagine it must be easier to write books in this way than it is interesting to read them. Mr. Sewall would have been much better advised, we think, to digest his material properly and present it to his readers in some more acceptable form. He could then have given a connected account of the remarkable developments that have followed the discoveries of Maxwell and Hertz which would have been of great practical use to students of the subject. At present we doubt if his book is intelligible to the amateur or useful to the expert.

(2) The late Prof. S. Lemström occupied himself for many years with experiments on the effect of electricity on growing plants, and this little book contains the results of his work. If the conclusions at which the author arrives are confirmed by the work of other investigators, the subject is one which merits the most careful consideration by all agriculturists. Practically only one type of experiment was tried; an influence machine was connected with one pole to earth and the other to a wire network over a field in which the crops were being grown. A discharge current could thus be passed either from the network to earth or *vice versa* for any desired number of hours a day. The experiments were tried on a comparatively large scale in several different localities. The effect produced by this treatment was remarkable. There was an average excess of the crop of the experimental field over that of a control field of 45 per cent.; the excess varies considerably with the nature of the crop and the conditions, soil, weather, &c. Not only is this increase in quantity produced, but there is also often an improvement in quality and a diminution in the time taken for the plants to mature. This last is a factor often of great importance to the grower

who can realise much higher prices by selling early in the season. Prof. Lemström calculated that in the case of wheat the outlay on a field of 25 acres will be repaid in two or three years, and that afterwards a net profit of 40l. a year or more can be realised. We cannot here enter into the details of the working, such as the best time of electrification, the effect of wet and dry weather, and so forth, but we should strongly advise those interested in the subject to study this book carefully; they will find it full of valuable suggestions, and the time spent in reading it will be amply repaid.

(3) We have already reviewed the first three volumes of this publication, so that it is only necessary here to refer briefly to the matter contained in the present volume. This is devoted to electric tramways, and is divided into seven chapters, dealing with overhead construction, feeders, surface contact systems, conduit systems, rolling stock, electric boats and motor cars, and electric traction on railways. The defects to which we alluded in our previous review are not so noticeable in this volume, which furnishes a good description of a very important branch of electrical engineering. The excellence of the illustrations is a characteristic of the whole production, and is a particularly valuable feature in the present instance, as the subjects are such that they cannot be effectually described without numerous photographs and diagrams.

(4) This exceedingly interesting monograph on the much debated theory of the chemical reactions taking place in the lead accumulator is probably already well known in the original German to those who have concerned themselves specially with this subject. Since the book first appeared the discussion has progressed a stage further, so that the English translation may be said to be out of date to a certain extent. This is, however, the penalty that the average English student has to pay for the neglect of his schoolmasters to teach him German, and he will probably therefore welcome the appearance of an English translation. Herr Dolezalek treats the subject from the standpoint of Nernst's osmotic theory, and shows that thermochemical considerations all point to the validity of the sulphate theory originally advanced by Gladstone and Tribe. Whether the author will succeed in satisfying others to the same extent as he has apparently satisfied himself may be regarded as open to question, but in any case the book is one which cannot be neglected by anyone wishing to study this complicated but fascinating problem.

(5) The design and construction of electric motors is becoming daily a matter of more importance to electrical engineers on account of the very rapid extension of the use of electricity for power purposes. When one considers the enormous number of trams, lifts, factories, &c., which are driven by electricity, it is easy to see not only how important the subject is, but also how very varied is the work which the electric motor is called upon to perform. If the development now is great, in a few years' time, when some of the numerous power schemes are more matured, it will be much greater still. The student of electrical engineering may find here ample scope for his abilities, and he cannot consult a better guide than the volume before us.

The book is divided into two parts, the first dealing with continuous and the second with alternating current motors. The relative advantages of different types are considered in detail, and there are numerous calculations of motors of different types and capacities. In addition, there are a large number of curves, diagrams, and photographs.

(6) The essays which are comprised in M. Cornu's little book were written with a special and rather peculiar object, the author having been requested by some of his old pupils, who had been unable to keep touch with the rapid development of electrical engineering, to write for them something which would enable them to appreciate better the technical or semi-technical literature of to-day. These "Notices" are consequently of a somewhat elementary character, nor can the book be regarded in any sense as a text-book of electricity. But M. Cornu has succeeded in writing a book which should appeal to a very much larger audience than that for which it was originally intended; one cannot look through its pages without realising at every point that it is the work of a master, and such works repay study by all—the most advanced as well as the most elementary students. The beginner will find here ideas expressed clearly and concisely, and cannot fail to derive great benefit from the book as an introduction to more detailed treatises. The engineer will see well known facts expressed in new and suggestive language, and will doubtless have his own views enlarged in consequence. The subjects dealt with are the correlation of the phenomena of static and dynamic electricity; generators, transmission of power and polyphase currents, and we would strongly recommend anyone interested in any of these matters to spend a few hours reading M. Cornu's admirable booklet.

(7) We cannot help being conscious that the end of 1904 is rather late in the day to review a book which contains a *résumé* of the technical achievements of 1903. Still, as we gather that this publication is intended to appear annually, this notice may be of some service in directing readers' attention to the volume dealing with this year's progress, which we imagine will appear very soon; in addition, it may be pleaded that the lapse of time enables one to see matters more in the right perspective, and so to form a better estimate of the value of M. Da Cunha's work. The book ranges over a great variety of subjects. Thus we find at one place a mathematical calculation of the mechanical problems involved in "looping the loop," and in another a discussion of alcoholism and temperance worthy of the columns of a daily paper in the silly season. Between these extremes lie such subjects as the progress in wireless telegraphy, automobilism, aerial navigation, and the hundred and one other technical developments which are taking place in all branches of applied science. To the engineer the book can serve no other purpose than to while away an idle hour or so. The general reader who is interested in scientific and technical progress may read it with both profit and pleasure. He will find the descriptions clear, the style agreeable, and the illustrations and diagrams in many cases excellent.

M. S.