

### Thermionic Valves and Radio Communication.

*The Thermionic Valve and its Developments in Radio-Telegraphy and Telephony.* By Prof. J. A. Fleming. Second edition, fully revised. Pp. xiii + 438. (London: The Wireless Press, Ltd.; New York: Wireless Press, Inc., 1924.) 15s.

So rapid have been the advances made in radiotelegraphy and radiotelephony that the author has found it necessary to rewrite much of the first edition of this useful book. The invention of the two-electrode thermionic valve by Prof. Fleming in 1904 made an entirely new departure in the radio art. The subsequent development of the hard three-electrode valve marks an equally important advance. With the exception of the crystal detector, all other types of detector for electric waves have now been made antiquated. As a generator of electric oscillations the valve has come to the front. As a relay or repeater in telephony also it is being very widely used. The author has added a new chapter on thermionic relays. A telephone line filter is described, and a clear account is given of carrier wave telephony applied to ordinary telephone lines. Speech has been transmitted perfectly from the Atlantic to the Pacific Ocean. It first passed by radio thirty miles over the sea, then 4000 miles overland by wire, and finally it passed thirty miles over sea again by radio. All the transmissions were effected by thermionic valves, no human agency being employed.

*Thermionic Tubes in Radio Telegraphy and Telephony.* By John Scott-Taggart. Second edition. Pp. xxiv + 470. (London: The Wireless Press, Ltd.; New York: Wireless Press, Inc., 1924.) 15s.

THE thermionic valve has come into almost universal use for radio-communication. This volume describes the development of this valve and gives many of its

applications. The author has considerable practical experience of valves and has made a judicious selection from the leading papers and the more important patents on the subject. If he errs at all, it is in making the book too comprehensive and going too much into detail. A beginner reading this book almost wants some one to point out what to read and what to omit, at least, on a first reading. Very properly the author begins by describing the phenomena in terms of modern theory. But we are afraid that our imagination fails to grasp what is meant by saying that there are about  $10^{22}$  free electrons in a cubic centimetre of cold metal. Current is taken as flowing from points of high negative potential to points of low negative potential. Modern theory certainly explains very satisfactorily the working of the three-electrode thermionic valve. We can recommend this book to serious students of the subject.

*Wireless Possibilities.* By Prof. A. M. Low. Pp. 77. (London: Kegan Paul and Co., Ltd., 1924.) 2s. 6d. net.

It is useful occasionally to try to unravel the future. This is usually left to poets. The author of this little book, however, encouraged doubtless by the marvellous linking up of the whole world by radio-communication, has ventured to indicate some of the lines along which future developments will probably take place. Incidentally the reader learns many useful scientific facts. Radio television has almost been realised. Why not methods of preventing local thunderstorms and of improving the growth of wheat or of young animals? Radio waves may affect our health. Why should we not try to render this effect beneficial? The days of the outside aerial are limited. The study of radio-active materials may in one day produce the cold-emitter valve. It is difficult to believe that we are not on the eve of great scientific developments.

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