

### Astronomical Physics.

*Astronomical Physics.* By F. J. M. Stratton. Pp. xi+213+32 plates. (London: Methuen and Co., Ltd., 1925.) 12s. 6d. net.

WITH the whole universe for its field of inquiry, astronomical physics is necessarily a very large subject, and an attempt to present its methods and results in a single volume of modest size can scarcely be expected to satisfy the requirements of all classes of readers. In some respects, however, the author of the book before us has achieved his task with distinct success. In the space of two hundred pages he has covered the whole range of astronomical physics from its beginnings to the most recent speculations in cosmogony, and we have failed to notice any subject of importance which has not received some mention.

The author's aim has been "to provide a useful book on the subject for the student, and one which every astrophysicist and not a few spectroscopists would want constantly within reach," and he has endeavoured to compensate for brevity of treatment by giving an abundance of references. As a guide to original sources of information the book will certainly be of great value to actual workers in astronomical physics, and to all serious students of the subject who have access to a suitable library. Physicists desiring to become more closely acquainted with the inter-relationships of physics and astronomy, which are becoming more and more numerous, will also find the book of great service, and to them it may possibly not appear to suffer from undue compression. It seems unlikely, however, that the book will appeal to the general reader, for whom it is to be feared that much of the text may be too sketchy for intelligibility. One wonders, for example, how such a reader would fare in trying to interpret the photographs showing Zeeman effects in sunspots (Plate 17) from the few lines of description which accompany them.

Historical references, instruments, and laboratory investigations form the subjects of the earlier chapters, and these are followed by others on the sun, the solar system, stellar radiation, motion in the line of sight, stellar classification, giant and dwarf stars, nebulae, novae, variable stars, stars with peculiar spectra, and, finally, by a chapter on speculations in cosmogony. Among the subjects most fully dealt with are the criteria for the various groups of the Harvard classification of stellar spectra, and the determination of the orbit of a spectroscopic binary. Misprints are very few, but attention may be directed to the unfinished deduction of the formula for the Doppler displacement on p. 83 and the necessity for substitution of  $u$  for  $u/c$  in the last equation.

The thirty-two plates which illustrate the volume have been well chosen and are satisfactorily reproduced. Diagrams are only four in number, and additional ones might have been introduced with advantage, as, for example, light-curves of typical variable stars. A number of useful tables, including standard wave-lengths, are given as appendices. It is difficult, however, to see the application to the subjects dealt with of the table for correcting wave-lengths to vacuum; a list of bright stars with particulars of their spectra and other characteristics would have been of greater interest.

As a summary of the main facts of astrophysics, and as a reminder on problems awaiting solution, the book is a welcome addition to the few works on the subject at present available.

### Conduction in Nerves.

*The Theory of Decrementless Conduction in Narcotised Region of Nerve.* By Prof. Genichi Kato. New edition. Pp. v+166+6 plates. (Tokyo: Nankōdō, Hongo, 1924.) 3 dollars.

UNTIL Prof. Kato had contributed this most important monograph to the study of the nervous system, it had been held generally that a nerve impulse passing through a length of nerve which had been rendered un-normal in some way, as by the action of narcotic drugs, underwent a gradual diminution in its course ('decrement'), leading, if the narcotised region were sufficiently long, to its complete extinction. If the impulse did regain normal nerve without suffering extinction, it regained its normal magnitude to the full.

The author contends that this view is erroneous. He and his colleagues in Keio University have used in their experiments a sciatic-nerve-gastrocnemius-muscle preparation which is 10 centimetres long, obtained from the Japanese toad *Bufo vulgaris Japonicus*. Such a preparation may be put in a narcotising chamber without fear of diffusion from the outside—and consequent dilution of the narcotic—upsetting the narcosis of the region observed. By varying the length of the chambers and the narcotising solutions or vapours therein contained, or by observing the electrical responses from narcotised nerve, evidence is produced against there being a gradual diminution. The impulse is subnormal but it does not suffer 'decrement.' On reaching again un-narcotised nerve, the impulse becomes normal. When the degree of narcosis is pressed, excitability and conductivity disappear simultaneously.

The unusual length of nerve in the Japanese toad gives also latitude for observations on the spread of