

## SHORTER NOTICES

*Über die Darstellung von Gruppen in Galoisschen Feldern.* By R. Brauer. (Actualités Scientifiques et Industrielles, No. 195.) Paris, Hermann, 1935. 15 pp.

A given finite group can be represented in a number of ways as a linear group. The number of distinct representations of this sort when the coefficients of the linear substitutions are complex numbers has been shown by Frobenius to be the same as the number of conjugate sets of elements of the group. The author considers the same question, requiring the coefficients of the linear substitutions to lie in the minimal algebraically closed field determined by  $GF(p)$ , where  $p$  is a prime. When  $p$  does not divide the order of the group Dickson has shown that the number of representations is the same as for the field of complex numbers. When  $p$  divides the order of  $G$  the author shows that the number of distinct representations is the same as the numbers of conjugate sets of operators which have orders prime to  $p$ .

In the second part of the paper the author considers the number of indecomposable (unzerfällbar) components of the regular representation of the group and shows it to be the same as the number determined above, making use of the conjoint of the given group.

H. R. BRAHANA

*Theoretical Astrophysics.* By S. Rosseland. Oxford, Clarendon Press, 1936. 19+355 pp.

In the words of its author, the aim of this remarkable book is to formulate a program of theoretical astrophysics. It "contains what may be called a bird's eye view of our knowledge of stellar atmospheres and envelopes, projected on to atomic physics as a background." A second volume, dealing with the internal structure of stars, is promised by the author.

Nearly one-third of the book is devoted to developing those phases of quantum mechanics which are of interest in astrophysics. Particular emphasis is placed on spectroscopy. Even this portion of the book, which serves merely as an introduction to the central theme, is distinguished by clarity of presentation and elegance of mathematical argument, so much so, indeed, that the physicist not primarily interested in what follows will feel attracted by the manner in which the material is put.

The next chapter deals with the transfer of radiation through absorbing and emitting media, a problem which calls for an interesting application of hydrodynamic theory. After this the author turns to an investigation of empirical data on profiles and total intensities of stellar absorption lines. His survey is everywhere careful and critical, pointing out discrepancies as well as the numerous sources of inaccuracy of the theories involved. The opacity of stellar atmospheres is interestingly explained as chiefly due to absorption by excited electrons with accompanying photoelectric effect. Splitting and broadening of spectral lines due to Zeeman and Stark effects are treated rather