

The concluding Chapter 8 contains new results on the problem of rational automorphisms and their decomposition into a product of rational reflexions, a problem which, as the author comments, has not previously received the attention it deserves.

It will be apparent from the above remarks that this tract is something of a tour de force, taking the reader with a minimum of equipment in a mere 140 pages through much of the classical theory and up to some of its modern developments. The reviewer cannot help feeling however that a more discursive style would have been helpful to the beginner: many of the proofs are very concise, and the reader who is not presumed to know the theory of quadratic residues should not have to read foot-notes in order to discover Legendre's three-square theorem. Criticism can also be levelled at the index, which consists of a single page and is of little value, and at the minimal bibliography, which does not even list B. W. Jones' *Carus Monograph* (1950).

The elementary arithmetic theory of quadratic forms is excellent material for a graduate course in number theory, and this tract certainly fills a real need in providing a modern text well suited to students' use. Moreover, the careful development of the theory and the inclusion of recent work make this a valuable addition to the library of research workers in the field.

E. S. Barnes, University of Adelaide, South Australia

The Mathematics of Radiative Transfer, by I. W. Busbridge. Cambridge tracts in Mathematics and Physics number 50, Cambridge University Press and Macmillan Company of Canada. 143 pages. \$ 5.00.

Problems of radiative transfer are extremely involved and the theory which has grown up around this subject has become complex and heavy. The author, in her preface, states that "The theory of finite atmospheres, in particular, has been in a confused state for some years." It is therefore a pleasure to welcome a book which takes the reader with comparative ease through this labyrinthian subject in less than 145 pages of print.

The brevity necessarily imposed upon the author has led to a crisp and uncluttered style which makes for much easier reading than is frequently encountered in this subject. Miss Busbridge has done much research in the subject so that her account is authoritative.

The book consists of 10 chapters and an appendix. In the first chapter the equation of transfer is established, starting from funda-

mental physical principles. This is a somewhat difficult chapter owing largely to the number of transformations required before reasonable simplicity can be achieved. In Chapter 2 the author discusses the remarkable H function. It was discovered by Ambartsumian and Chandrasekhar, independently of each other, that problems of radiative transfer in semi-infinite atmospheres can often be reduced to the problem of solving a certain, unfortunately non-linear, integral equation. The solution of this equation is the H function. Chapters 3 and 4 are devoted to the study of the linear operators and associated integral equations which have gradually grown up around the subject of radiative transfer. Here the going, especially for the pure mathematician, is much easier. Chapter 5 shows how the well known Wiener-Hopf methods can be used to solve some of the problems which occur in this subject. All the discussion in Chapters 2, 3, 4 and 5, and also in Chapter 6, is devoted to the case of the semi-infinite atmosphere. In Chapters 7, 8 and 9, the author deals with the case of finite atmospheres. Here the H function must be replaced by two functions, the X and Y functions, which satisfy non-linear simultaneous integral equations. These functions are not completely understood yet and the author's account gives a brief, but reasonably comprehensive, description of them.

A final chapter is devoted to problems of anisotropic scattering in the case of axial symmetry. In spite of the complexity of the phase function the problems are once again reduced, in a rather beautiful manner, to the H function already mentioned.

On page 143 there is an index of notations which I hope will be very much amplified in future editions.

The production is of the usual high standard associated with the Cambridge University Press and the book can be thoroughly recommended to all those who are interested in radiation transfer problems either as learners or as researchers.

Charles Fox, McGill University

Boolean Algebra and Its Applications, by J. Eldon Whitesitt.
Addison-Wesley, Reading, Mass. 1961. x + 182 pages. \$ 6.75.

In this introductory text the author develops his subject in a way which requires a minimum of formal mathematical knowledge. This is done through concrete applications of Boolean algebra, viz. the algebra of sets, symbolic logic, and with principal emphasis on the engineering application to switching algebra. In addition, the second chapter develops Boolean algebra axiomatically and, as if as an afterthought, the last chapter deals with some combinatorics and elementary probability theory.