

ness of his work, if he had dwelled longer on the elementary material of his first chapter. The reader who tackles his book without previous knowledge of Laguerre geometry will find the going hard at the beginning. Once he has overcome the initial difficulties, however, he will be richly rewarded by the great number of beautiful results which fall into his lap, and by the mastery of a method which will allow him to find many more results by his own effort.

The book has a complete bibliography and an excellent index.

D. J. STRUIK

*The theory and applications of harmonic integrals.* By W. V. D. Hodge. Cambridge, University Press; New York, Macmillan, 1941. 9+281 pp. \$4.50.

This is one of those books which everyone who specializes in a particular branch of group theory, of the theory of algebraic surfaces, of the theory of Riemann surfaces, of topology or of the tensor analysis should consult. It shows how all these different fields are connected, and not connected in some superficial way or in the form of an analogy, but in an essential manner, so that interesting and profound theorems in one field cannot be understood without a thorough knowledge of other fields. In reading this book one is reminded of books like Klein's "Ikosaeder," which is also a blend of several important fields. The task of the reviewer of such a book is hard, because he has seldom the enviable mastery of the different branches of mathematics which the author possesses. At the same time he must praise the author for the beautiful exposition of so many and different fields.

There are chapters on Riemannian manifolds, on integrals and their periods, on harmonic integrals, on their applications to algebraic varieties and on their applications to the theory of continuous groups. The first chapter, on Riemannian manifolds, is divided into a part on tensor calculus and into a part on the topology of such manifolds. All these topics are prepared in a very careful way, with precautions which will satisfy strict demands of rigor. There are references at the end of each chapter.

To indicate the contents of this book by simply copying the chapter headings is to do a great injustice to the author and his work. There is a leading thought in the choice of subject matter, and that is the study of harmonic integrals. Harmonic integrals, however, are not the capricious invention of an imaginative scholar. They appear quite naturally in the generalization of the problems set by