that a_1, a_2 and a_3 vanish identically. Hexagonal honeycombs of surfaces and octahedral and hexagonal honeycombs of planes are also discussed.

In the last two chapters n-honeycombs of curves in a plane E_2 and in a space E_3 are studied for different values of n. At the end of Chapter II and Chapter III there are listed a few problems, some of which are referred to current papers.

C. C. HSIUNG

Darstellungen von Gruppen, mit Berücksichtigung der Bedürfnisse der modernen Physik. By H. Boerner (Die Grundlehren der mathematischen Wissenschaften, vol. 74) Berlin-Göttingen-Heidelberg, Springer-Verlag, 1955. 11+287 pp. DM 36.60.

This book is concerned with the representation theory of finite groups and of the classical Lie groups, with the exception of the symplectic group. The literature on the classical groups has not been noted for its lucidity up to now. This book does a great deal to clarify matters and to render the theory more accessible. This is due largely to the tangibility and explicitness with which the author treats things. For example, the necessary parts of the Lie theory are dealt with in a very neat and concrete way so that it would be possible for a person unfamiliar with it to obtain a good insight into how it works. On the other hand, some more classical matters such as the Wedderburn theorems and Maschke's theorem are treated in a very conservative manner—lots of idempotents and matrices—which possibly is not in accord with the highest aesthetic ideals. The first chapter is devoted to elementary linear algebra and the next two develop the general representation theory of finite groups and linear Lie groups. Lie algebras and group integration are introduced and the character relations for compact Lie groups are obtained. Throughout the whole book the ground field is assumed to be of characteristic zero and, for the most part, algebraically closed. There is an extensive and detailed account of the representation theory of the symmetric group which is certainly one of the most complete available. The rest of the book deals with the classical groups. Generally speaking, the treatment is as purely algebraic as possible; comparatively little use is made of group integration. The representations of the full linear group are obtained as in Weyl's book (*The Classical Groups*, Princeton, 1936). In this connection there is one elementary point which the author does not make sufficiently clear. It is shown that the semigroup of all square matrices of degree n induces the full algebra of bisymmetric transformations on the space of tensors of given rank. However it is necessary to show that the group of nonsingular matrices will do it. This is not exactly trivial and requires some such device as Weyl's principle of irrelevance of algebraic inequalities. A rather unusual and commendable feature of the book is the treatment of the rotation group by the method of Stiefel. The spin representations are obtained in several ways, including the method of Brauer and Weyl. The author's handling of the topological matters relevant to the rotation group is perforce rather sketchy, as he readily admits. However it could be made somewhat less so with very little extra effort. For instance, it would be no trouble to give at least a precise analytic definition of homotopy before constructing covering groups. The final chapter is devoted to the finite-dimensional representations of the Lorentz group.

The subject of which this book treats is a difficult one and it is far from easy to achieve clarity of exposition in dealing with it. In the reviewer's opinion, Professor Boerner has succeeded in this respect better than anybody so far. Not the least of the consequences is that it renders more accessible the rest of the literature on the subject, especially Weyl's book which even after all the years since its publication still contains such a wealth of stimulating ideas. There is only one major regret, namely that the symplectic group has been ignored, presumably because of the absence of applications to physics. It is sincerely to be hoped that it will come in for its proper share of attention in a future edition.

W. E. JENNER

The convolution transform by I. I. Hirschman and D. V. Widder. Princeton, Princeton University Press, 1955. 10+268 pp. $5.50.

At a time when so much mathematics writing has had a tendency to become ponderous and unreadable it is a pleasure to have this excellent book appear. The style of the authors has become well known through their extensive papers and the precision and care that has marked their writing in the past is scrupulously maintained throughout the book. Furthermore the subject is itself of considerable interest being classical in every sense of the word, and appearing again and again in the most varied contemporary contexts. The problems treated are solved on their own ground and the theorems are not based on changing the problem. The ratio of theorems to definitions in this book is high.

The main part of the book is devoted to a study of the convolution equation whose kernel has the property that the reciprocal of its La-