ator on the space of bounded sequences. This theorem again has nothing to do with symmetry, and that seems important as we have seen that the nonsymmetric inversion problem arises naturally in probability theory. Unfortunately the analogous problem for one-sided infinite Toeplitz matrices was not yet solved when this book was written.[1]

The book is authoritatively documented by means of an appendix of 10 pages, providing references as well as remarks which clarify the mathematical or historical setting of important ideas in the text. The mathematical presentation is of the same high caliber as in Szegö's *Orthogonal polynomials*, but even more elegant because the subject matter here is so much more unified. Most of the background theory required in the book is relegated to an introductory chapter. Therefore there are no digressions from the natural development of the theory, and this has enabled the authors to write in a terse but at the same time pleasingly informal style.

Not only good students but also serious research workers may find this book difficult if they want to fully bridge the conceptual gap between the two fields which are unified here. But as the book offers so much more than would two separate monographs in the corresponding subjects of analysis and probability, this is precisely the challenge it offers to the reader. The content of the book is evidence enough that this challenge will contribute to the growth of mathematics.

F. SPITZER

Contributions to the theory of games, vol. III. Ed. by M. Dresher, A. W. Tucker and P. Wolfe. Annals of Mathematics Study, no. 39. Princeton, Princeton University Press, 1957. 8+435 pp. $5.00.

This is the third volume in a series on the theory of games, a series which can teach an interesting lesson in mathematical publication applicable to other branches of mathematics. The present volume, as the preceding volumes, is made up of a number (twenty-three in this instance) of individual papers on the theory of games grouped into five general classifications. The volume is prefaced by an introduction which briefly explains this classification and then gives brief summaries of the individual papers. The would-be reader can decide from these summaries what papers he wishes to read. No one not interested in game theory need enter these portals and waste his time.

[1] *Added in proof.* The continuous analogue of this problem is famous under the name of the Wiener-Hopf equation. It was recently solved by M. Krein (Uspehi Mat. Nauk, 1958).

At the same time, for workers in game theory the burden of searching the literature is lightened by this concentration of papers in one volume. The system has obvious merits and only one possible disadvantage, excessive editorial control. As far as this reviewer can determine, the editorial supervision in this volume has been very modest and entirely benevolent. One consequence of this kind of publication is that there is little need for the services of a reviewer, including this one; the introduction is in itself a review.

As is to be expected, over these last few years of study the notion of a game has undergone considerable formalization and abstraction from its original beginnings among parlor games which, after all, merit only a very limited amount of serious mathematical effort. Thus one of the papers in this volume discusses the abstract questions of (a) how the rules of a game are to be given so that the game can actually be played and (b) whether the optimal strategies of such a game are always effectively computable. Another paper studies, in an arbitrary topological space, the Banach-Mazur game: Two players alternately choose nonempty, closed, bounded intervals of the real line so that each interval is properly contained in the preceding. The first (second) player wins if the intersection of a given set A with this nest of intervals is nonempty (empty). A by-product of the solution of this game is the Banach category theorem. In contradistinction, another paper leans to the "practical" side and solves the "m by n bullet silent duel." This game is the formalization of a pistol duel in which the two duellists are supplied with, respectively, m and n bullets, and approach each other from the start of the duel; the duel's being silent means that each participant is unaware that his opponent has fired at him unless the shot has taken effect.

The majority of the games are quite formal and not so easily or picturesquely describable as those above. They are classified by the editors under (a) games whose moves are plays of other games, (b) games with perfect information, (c) games with partial information, (d) games with a continuum of strategies, (e) games with a continuum of moves. Some of the papers are very interesting, either from a game theoretic point of view, or because of the light shed on other branches of mathematics, or both. One or two are quite forced and dull, and the mathematical effort which has gone into them could have been expended on worthier causes. For the former papers we are all obliged to the authors, and for the conscientious and intelligent editorial job we are indebted to the editors.

J. WOLFOWITZ