physics and engineering, but rather to develop the material from a few basic concepts; namely, Hamilton's principle together with the theory of the first variation, and Bernoulli's separation method for the solution of linear homogeneous partial differential equations. The author's persuasive style appears certain to gain adherents for his viewpoints on many college campuses this coming fall.

Hamilton's principle and the theory of the first variation occupy Chapter 1. The representation of some physical phenomena by partial differential equations (vibrating string and membrane, heat conduction and potential equation) forms the subject matter of Chapter II. Chapter III contains general remarks on the existence and uniqueness of solutions and the presentation of Bernoulli's method of separation of variables, while Chapter IV is devoted to Fourier series. Chapter V deals with self-adjoint boundary-value problems, the concept of their eigenvalues being developed according to the elementary method of H. Pruefer in *Mathematische Annalen*, v. 95 (1926). Chapters VI and VIII, on special functions, deal with Legendre polynomials and Bessel functions, and spherical harmonics, respectively. Chapter VII develops the characterization of eigenvalues by a variational principle; while the final Chapter IX is devoted to the nonhomogeneous boundary-value problem (Green's function and generalized Green's function).

The text is well designed for class room use. The author intends it to be used in a two-semester three-credit course. Each chapter is generously provided with interesting exercises (answers and hints are provided at the end of the book for the even-numbered problems). A recommended supplementary reading list concludes each chapter. A welcome innovation is the detailed appendix, containing a condensation of topics with which "the student who wishes to take this course with a reasonable chance to succeed should be familiar."

J. B. Diaz

The University of Maryland
College Park, Maryland

10[S]. Charles DeWitt Coleman, William R. Bozman & William F. Meggers, *Table of Wavenumbers*, Volumes I and II, U. S. Department of Commerce. Volume I—2000 A to 7000 A, and Volume II—7000 A to 1000 μ, 1960, vii + 500 p., and vii + 534 p., 35 cm. Price $6.00.

A two-volume table for converting wave lengths in standard air to wave numbers in vacuum was computed by using the equation $\sigma_{vac} = 1/(n\lambda_{air})$, where n was computed from Edlen's 1953 equation for the refractive index of air. Wave numbers are given to the nearest 0.001 K (cm^{-1}) for wave lengths from 2000 to 7000 A in volume I, and 7000 A to 1000 μ in volume II. Proportional tables are given for linear interpolation between entries of λ. Also included are the vacuum increase in wave length, $(n - 1)$, and the refractivity of standard air in the form $(n - 1) \times 1000$.

Authors' Summary

11[W]. Guy H. Orcutt, Martin Greenberger, John Korbel & Alice M. Rivlin, *Microanalysis of Socioeconomic Systems: A Simulation Study*, Harper & Brothers, New York, 1961, xviii + 425 p., 21 cm. Price $8.00.

In this book the authors discuss an experimental calculation carried out on a

high-speed calculator for the purpose of predicting the population trend during the period 1950 to 1960. The calculation is based on an elaborate model which is designed to simulate the demographic characteristics of the population by means of a large number of typical household units (approximately 5000). Each household unit represents a segment of the population, such as the married white female members between the ages of 20 and 25. The calculation proceeds in short time increments (months) until the final state is reached. The distribution of the population is computed at each time interval, taking into consideration the probabilities for such occurrences as births, deaths, divorces, etc. This process may be compared to the use of the Monte Carlo method for the solution of the diffusion equations in physics.

The reviewer believes that the authors would have better served the interests of future research in this field if they had devoted their discussion to a factual description of the results attained and difficulties encountered in carrying out this interesting but rather restricted experiment. However, as indicated by the somewhat pretentious title, this is not the primary emphasis of the book. The authors appear to stress the potential application of their techniques in the simulation of the total social-economic structure of the United States; and the book is promoted as a "pioneer work with a new approach to the scientific study and analysis of social systems, employing the major tools of modern research." The enthusiasm of the authors for their methods would have been more easily understandable if their calculations would have accurately predicted what the population distribution will be in 1970, rather than what it was in 1960.

H. P.

12[W, X]. MELVIN DRESHER, *Games of Strategy: Theory and Applications*, Prentice-Hall, Inc., Englewood Cliffs, New Jersey. 1961, xii + 186 p., 23 cm. Price $9.00.

This small volume on zero-sum two-person games contains essentially the whole story on finite games and a great deal on infinite games. It can be profitably read by anyone with some calculus and the first chapter or so of matrix theory behind him. The author presents an elementary proof of the minimax theorem which also yields a good computational procedure for solving finite games. The properties of optimal strategies are then discussed in an exhaustive and illuminating manner, and various methods of solving games are described. The subject of infinite games, filling one-half the book, is treated next, and the topics covered include games with convex payoff functions, games of timing, and games with separable payoff functions. Numerous examples of such games, described in military terms, are given and their solutions discussed thoroughly. The author's style is pleasant, and the printing and layout of the book are attractive.

JOSEPH BRAM

Applied Mathematics Laboratory
David Taylor Model Basin
Washington 7, D. C.

13[X, Z]. L. LAYTON, H. SMITH & L. CHATFIELD, *Proceedings of Executive Seminar on the Use of High-Speed Calculators for the Solution of Naval Problems*, Applied