fundamental algebraic facts are realized in living nature. Although it is widely accepted that much (if not all) of science consists of the construction and demonstration of isomorphism-relationships between mathematics (as created by the human mind) and the structure of the external world (as interpreted by the human senses) this acceptance tends to remain lipservice with respect to algebra and is usually operative only in the more difficult higher analysis as used in physics, aerodynamics etc, It is satisfying to see that elementary algebra also has its realisations, not merely in artificial line-diagrams and urn- and marble schemes, but also in living beings. The exposition is equally clear in their mathematical principles and in their applications to practical problems in plant - and animal breeding. The only additional points which the reviewer would like to see discussed in these chapters are the applications of more refined combinatorial formulae to the enumeration of genotypes, results obtained by Fisher and Bennet. The more advanced chapters of the book - dealing with passages from generation to generation - give a sound outline of the foundations of matrix algebra, with theorems on the relative magnitude of the latent roots. It could be desired, however, that beyond this basic formal treatment some elaboration be given to the use of stochastic-process theory (as initiated by Fisher, and more recently highly refined by M. Kimura and P. A. P. Moran) in the description of the composition of successive generations. The importance of the final chapters, on human genetics, is foreshaded early in the book where the ethical impossibility of appropriately designed mating experiments and the additional difficulty inherent in the long generation times is clearly indicated. The refinements of statistical methods (achieved mainly by C. A. B. Smith and by J. B. S. Haldane) are brilliantly outlined in the final chapters. The authors, with praiseworthy self-restraint, keep to the scope of the book as indicated by the title ("Methodes") and refrain from elaborating the clinico-medical and the politico-sociological aspects of the findings these "methods" render available. The reader whose appetite is whetted for such material can, if he wishes, turn to the works of L. Hogben, C. D. Darlington, and L. S. Penrose.

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Finite-Difference Methods for Partial Differential Equations, by George E. Forsythe and Wolfgang R. Wasow. Wiley and Sons, Inc. New York, 1960. 444 + x pages. $11.50.

This book, with more than 400 pages of text and a 16 page bibliography, is a most prolific source of information on numerical methods for problems in partial differential equations. The material in the book is elementary, presupposing only advanced calculus and linear algebra and requiring no previous knowledge of the theory of partial differential equations. Important concepts are developed and illustrated in comparatively simple contexts, with references to the literature for more complex applications.

The first, an introductory chapter, deals with the classification of partial differential equations and contains an interesting discussion of "well-posed" problems. A brief discussion of digital computers is given, concluding with some statistics on the demands made upon these machines by problems of the type discussed in the book. The following three chapters deal with hyperbolic, parabolic and elliptic equations in two independent variables, respectively, while a final chapter is concerned with initial-value problems in more than two independent variables.

The chapter on hyperbolic equations begins with a discussion of initial-value problems for the elementary wave-equation. Difference equations are set up and solved analytically, and the solutions compared with the exact solution of the Cauchy problem. In this context, concepts of convergence and stability of finite-difference schemes are introduced and illustrated. The remainder of the chapter is devoted to hyperbolic systems of two first order equations. The characteristics and canonical forms are defined, and finite difference and other numerical methods described. An interesting discussion of shock waves concludes the chapter. Methods of proving convergence and analyses of discretization and round-off error are given. The material is illustrated by application to the first order system equivalent to the wave-equation and to the equations of one-dimensional isentropic flow.

The treatment of parabolic equations also begins with a discussion of the simplest problem, that of heat flow in a half-plane, for which analytic solutions of both the differential and difference equations may be obtained. Subsequently, both implicit and explicit difference methods are described and analyzed as applied to more complex linear problems. Some discussion of the application of methods of functional analysis is given, and the chapter concludes with a brief discussion of methods for semilinear problems.

The longest chapter in the book is devoted to boundary value problems in elliptic equations. After a brief description of typical problems in their physical contexts and a section devoted to the theory of elliptic equations, various methods for deriving difference equations are developed, for both regular and irregular nets. The problems described include the classical potential theoretic and eigenvalue problems as well as problems involving interfaces and free boundaries. An extensive and highly technical treatment of methods for solving elliptic difference equations is given, including, besides general methods such as elimination, methods especially suited to these problems, particularly overrelaxation methods. Variational procedures for estimating eigenvalues are discussed, and numerical methods for solving the finite systems obtained are described. Finally, the chapter concludes with an interesting discussion of the problems involved in organizing these calculations for a computer, pointing out that the machines should be applied to obtain the difference equations as well as to solve them.

The final chapter contains, among other topics, a discussion of the problem of weather forecasting by direct solution of the relevant hydrodynamical and thermodynamical equations.

This book is certainly a useful guide to persons faced with the numerical solution of any problem in this field. The material presented is clearly set forth, and the techniques described can be adapted to a wide variety of situations. It is valuable also as a text or reference work for graduate courses in Numerical Analysis.

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Introduction to the Mechanics of Continua, by W. Prager. Ginn and Company, Boston, 1961. x + 230 pages. $8.00.

The book consists of an introductory chapter of 38 pages containing the necessary mathematical preliminaries and nine chapters (179 pages) of text proper.

The author attempts a difficult task in attempting to present an integrated picture of the principal theories of the mechanics of continuous media and succeeds very well in the space of only 179 pages. Argument could, of course, arise as to what should be included in such a book but in my opinion the author makes a very intelligent selection of material from this vast field.

Tensor notation is chiefly used throughout the book and the first chapter contains a good introduction to tensor analysis. The next three chapters discuss general kinematical and physical foundations that are applicable without assuming a specific mechanical behavior for the medium. Chapters V, VI and VII are titled Perfect Fluids, Viscous Fluids, and Visco-plastic and Perfectly Plastic Materials, respectively, and give good accounts of the basic ideas of these subjects. Chapter VIII, titled Hypoelastic Materials; Classical Theory of Elasticity, treats the mechanical behavior of mediums defined by a homogeneous relation between the stress rate and deformation rate tensors (hypoelastic) and in particular the classical elastic behavior. In Chapter IX, titled Finite Strain, several strain and corresponding stress tensors are introduced without assumptions as to any specific mechanical