It also appears difficult to decide what the significant elements of the system are.

I think many researchers do not completely understand the ideas inherent in system modelling. While a model can be postulated on the basis of data from one experiment, it is necessary to use data from another independent experiment to verify the model. Apparently, most of these experimenters do not do this. In fact, it appears that only a very few data points were gathered (although we are rarely told the number of cases or data points.) This paucity of data probably causes most of the difficulties that I noticed. Some "experimenters" apparently only postulated models—they did not even try to gather confirmatory data. Most of the papers contain a few statements about the model, a couple of general equations, little or no data, and some carefully vague conclusions.

I must hasten to add that there are some good papers where the data is abundant and the model has been tested and appears to be valid. Most of these are on the cardiovascular and respiratory systems where the systems are treated on a fairly large scale. I would highly recommend this book to engineers entering physiological research as synoptic of the current research.

RICCATI DIFFERENTIAL EQUATIONS, by William T. Reid, Academic Press, Inc., 1972, 216 pp.

REVIEWED BY DAVID JORDAN[1]

[1]Electrical Engineering and Computer Science Department, University of Connecticut, Storrs, Conn.

Riccati equations, in differential or algebraic forms, arise in many areas of applied mathematics. In partiuclar, with the recent rise of interest in optimal control theory, they have become quite visible as an equation form common to many disciplines. Dr. Reid's monograph is a compilation of many of the known properties of these equations and their solutions. Dr. Reid is well known for his contributions in this area and has succeeded in developing a valuable reference work on Riccati equations.

This monograph is one of the Mathematics in Science and Engineering Series of books edited by Richard Bellman. The Mathematical level of presentation is quite high with little motivation for the results achieved. The initial three chapters develop the characteristics of general Riccati differential equations. The fourth chapter specializes these general results to the Hermitian Riccati Matrix Differential Equation form which is most commonly encountered. Some attention is given the related algebraic Riccati equation. The fifth and final chapter develops several applications which yield Riccati equations. The bibliography is complete and the results achieved represent the current level of mathematical understanding. There are no exercises or numerical examples although each chapter concludes with a section of annotated remarks.

In summary, Dr. Reid's monograph satisfies a need for a good reference work on Riccati equations. The book should be of interest to researchers and graduate level teachers in this area. The major thrust of this work is toward the mathematical properties of Riccati equations. The computational aspects of finding solutions to differential and algebraic Riccati equations are largely ignored.