We also agree with the author that disposable newspapers are convenient for covering a laboratory bench, but in the world of government funded industrial research, the use of old newspapers would pose monumental security and fiscal complexities. In academic laboratories (in this country) the political views of the newspapers need not conform with those of the department head since he is usually away advising the government or the chairmen of the boards of firms.

In the chapter on Miscellaneous Applications we can forgive the author for not making any suggestions for catching British train robbers, halting the population explosion, or for tracking down Los Angeles bank bandits. But it is disappointing to find no references to recent American developments of isotopic power sources (some now in orbit), the use of α-particle emitters in upper-atmospheric frost-point measurement equipment now being flown, etc., etc.

The book ends with six helpful appendices, a bibliography, and an index. Appendix I contains a number of circuit diagrams (none with transistors) for counters and other equipment; the remaining ones contain useful tables of data, recipes, and instructions. The 4+ page bibliography starts with Friedlander and Kennedy (and Miller now no doubt) and goes on from there in several well selected directions. We salute the index. Throughout the book are numerous tables, figures, graphs, and plates (including three of a buttercup leaf).

By tradition reviewers are supposed to be sleek tigers who have an uncanny ability to find and pounce upon any errors or weaknesses, trivial or not, that may occur. We can't rightly claim to be tigers (even in the current American sense), but just for the sake of the game we would like to know who was responsible for the last sentence beginning in line 6 on page 189. In the preface the author makes gracious acknowledgement to his wife and daughter for their help with the many fine illustrations in his book. Even at the risk of having to regret it for the rest of our days, *we* would like to ask just which track in plate VII is track A.

In *our* opinion Dr. Fremlin has made a valuable contribution to the applied experimental side of nuclear physics and chemistry and he has done it in a clear, scholarly, and down-to-earth manner. We hope he does a small monograph on the S-matrix with equal skill and refreshing tone. Dr. Fremlin's book is one of a series on physical sciences, the general editor of the series being Sir Graham Sutton who is well known for his researches on Meteorology.

Professor Don M. Yost, recently retired, has spent his entire career at the California Institute of Technology, where his broad interests in the fields of inorganic chemistry, physical chemistry, and mathematics, his stabilizing perspective in matters scientific and otherwise, his penetrating analysis of human nature, and his obvious wit and charm have combined to inspire and assist in the metamorphosis of numerous struggling graduate students into a long list of now well-known Ph.Ds, whose great admiration for "Don" he so richly deserves.

His co-author for the present book review is described in the following paragraph lifted from Prof. Yost's letter of transmittal: "You will note at once that I have a co-author on the review, videlicet Dr. John B. Hatcher, whom I believe you know. He has had considerable (and sometimes turbulent) experience with radioactivity, as well as with the publication business. About ten years ago he went into industry and is now a (wealthy) industrial chemist. His wife is an instructor in anthropology at the University of Minnesota. You may not know that Jack's father was a linotype operator, and that Jack learned the trade at an early age; as an undergraduate here he earned his way through school by linotyping; he was editor of the Caltech paper one year. In Iron Nail Club circles Jack writes under the pen name, Pasqualle de los Llanos."

Additional factual information on each man is found in American Men of Science. *Further enlightenment on the Iron Nail Club is allegedly contained in "A Memoir on the Origin of The Iron Nail Club", a review of which will be found on p. 5 of the Journal of Intermittency, 1, No. 1, May 1959 (published by the Intermittent Press, 3104 Silver Lake Road, Minneapolis 18, Minn.)*

FOR CALCULATING TRAJECTORIES . . .

Title ROCKET—Rand's Omnibus Calculator of the Kinematics of Earth Trajectories
Author Barry W. Boehm
Publisher Prentice-Hall, Inc., 1964
Pages xxxiv + 254
Price $5.95

Reviewer Otto C. Turchan

ROCKET—Rand's Omnibus Calculator of the Kinematics of Earth Trajectories—represents a digital computer program for the mathematical simulation of simple aerospace vehicle flight dynamics. This computer program was developed at the Rand Corporation as an aid to their research studies in astronautics and allied fields. In the review of this book it is evident that the contents are designed to represent a user's manual as an inseparable companion to the Rocket computer program. Consequently, the book itself is a valuable contribution to the field of potential users and programers who may be faced with the problem of adapting the Rocket computer program to the solution of some of the possible trajectory problems. The contents of the book can be best described as a set of operating instructions for the Rocket program user giving some insight into the fundamental construction and developmental details of the program itself.

The Rocket program is a mathematical tool by which the simple equations of motion of a point mass in an inverse-square central force field can be integrated by a digital computer to obtain vehicle position and velocity along the flown trajectory. The trajectory computation is per-

formed in an open-loop fashion capable of handling trajectory-shaping techniques using simple guidance and flight-control-program schemes. It may be noted that quite similar computer programs are being used in the simulation of preliminary performance trajectories.

A more rigorous mathematical simulation of aerospace vehicle flight dynamics must include the vehicle as a material body, whether it be rigid or flexible, a representative closed-loop autopilot and an adequate closed-loop guidance scheme. All of these elements can not be handled by the Rocket computer program as may be noted in the closing portion of the book. However, the advent of Fortran as a scientific programing language that can be used on practically all large-scale digital computers makes it possible to adapt the Rocket trajectory computation program to many different computers without any modifications, provided that the specific trajectory needs are satisfied. It may be recommended that anyone interested or actively engaged in the use of the Rocket computer program should acquire this book as the operational manual or guide to accompany the computer program, thus furnishing adequate operational instructions.

O. C. Turchan is a member of the Satellite Systems Division of the Aerospace Corporation, El Segundo, California. His professional career in the United States began in 1946 with the Turchan Follower Machine Co. Since then he has been active in physics and engineering with Hughes Aircraft Company, Space Technology Laboratories, Inc., and Aerospace Corporation, in aerospace systems research and development. He received his initial professional diploma (Dipl.-Ing.) in electro-mechanical engineering from the German Institute of Technology in Brünn. He holds BS (1950) and MS (1953) degrees from the University of Detroit and has done postgraduate work at UCLA and USC.

COMMUNICATING TO A COMPUTER

Title Introduction to Algol
Authors R. Baumann, M. Feliciano, F. L. Bauer, K. Samelson
Publisher Prentice-Hall, Inc., 1964
Pages x + 142
Price $9.00

Reviewer John E. Denes

This book is by far the best available text on a rather difficult subject, the fledgling universal computer programing language, Algol (ALG Orithmic Language). Algol is not yet accepted by the bulk of computer users in the United States and probably never will become the dominant programing language. However, there exists a constantly growing library of programs written in Algol, and even the casual computer user who does not want to be completely dependent upon professional programers will have to acknowledge Algol's existence. This primer, as it calls itself, seems to have been written for the casual user.

There is one serious objection to the book, namely that its price ($9.00) seems outrageous. Effectively, the book has 96 pages, many of which are more than half blank. Not included in this number is the 40-page appendix, a rigorous description of the language, which is of no value to the average user of the book and which, in addition, is only a reprint of freely available material already in the open literature. There is no other unfavorable comment to make.

In 1958 Fortran was a relatively new programing language implemented on only one computer, the IBM 704, and users of computers were searching for a universal machine-independent, problem-oriented language. Representatives of ACM (Association for Computing Machinery) and GAMM (Gesellschaft für Angewandte Mathematik und Mechanik) met in Zurich to try to reach an agreement on such a language. Their aim was to specify a universal language, based on mathematical notation and principles, acceptable to the computing profession. In those days, most computer usage was of a scientific nature and, thus, the language searched for omitted the needs of other users. The outcome of that and subsequent meetings was a rigorously defined language, Algol.

In most of Europe, where IBM's, and consequently Fortran's, influence was not as strong as in the United States, Algol enjoyed an immense success and became the dominant scientific programing language. In the United States, after the more-or-less forced implementation of Fortran by all computer manufacturers, Algol fared less well. The recent IBM announcement of its New Programing Language (NPL) might well mean the end of future development of Algol. However, Algol's past acceptance makes it impossible just to ignore its existence.

Increased use of large-scale computers and a continued shortage of professional computer programers has forced most scientists and engineers to acquire at least a superficial knowledge of programing. These computer users are not interested in computers per se; their interest lies mainly in using the computer as a tool, in getting solutions to their problems. For this, they demand that the professional programer supply them with some formal language in which to describe a problem solution, a language easily learned and not dependent upon a particular type of computer. Algol is such a language and, while not the most popular one, it is becoming more and more important to scientists and engineers.

Unfortunately, most descriptions of Algol are very formal and rigorous, written more for the implementer than for the user. This book is definitely written for the user. Its clear presentation, logical progression, and numerous examples make it useful for self-study. Some of the examples should have been chosen with more care to illustrate solely the programing aspect rather than add the distraction of numerical analysis. It is obvious that the author's intent was the book's use as a classroom text, in which case the selection of examples is understandable. The mature scientist should be able to take these ad-