served correspond to extremely fast radial-expansion velocities.

The book concludes with a rather sketchy review of theories of the origin of the solar system and an even briefer account of the origin of the chemical elements.

The style is direct, simple and quite attractive: Chapters are introduced by well written lead-ins and summaries. There are good tables and figures, a bibliography and two indices.

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S. Fred Singer, now deputy assistant secretary for scientific programs, Department of the Interior, is on leave from the University of Miami, where he organized, in December 1965, a symposium on observational aspects of cosmology.

Still more problems

PROBLEMS AND SOLUTIONS IN MATHEMATICAL PHYSICS. By Y. Choquet-Bruhat. 314 pp. Trans. by C. Peltzer. Holden-Day, San Francisco, 1967. $9.00

by Gerald C. Pomraning

The expression that necessity is the mother of invention can, with some degree of truth, be applied to this book by Madame Choquet-Bruhat. For several years there has been a clear need for the inclusion of a significant number of nontrivial examples, with solutions worked out in detail, in textbooks on contemporary applied mathematics. The "invention" in this case is a book of over 300 pages devoted entirely to such examples. Since the book gives no pretense of supplying the underlying theory necessary to fully understand these examples, it is essential, for the student at least, that it be used in conjunction with a standard text. The book recommended in the preface for this purpose is *Linear Algebra and Analysis* by A. Lichnerowicz. Fortunately for the American student, this French text has been translated into English (Holden-Day).

The areas covered in this book through 72 examples of about four parts each are best summarized by listing the eight chapter headings. These are: (1) linear mappings: operations on matrices; (2) proper values and proper vectors: reduction of matrices; (3) scalar product and norm: Hermitian operators; (4) vector calculus: multiple integrals; (5) function spaces and operators; (6) series expansions of functions; (7) differential equations; (8) partial differential equations. This list shows that, as far as examples are concerned, this book goes beyond the material supplied in Courant and Hilbert, Morse and Feshbach, and other books of similar hue. Nevertheless there are areas not included that would have made the book more interesting and complete. Problems involving probabilities always cause difficulties for students (as well as others), and a few well chosen examples using symmetry principles would have brought this book to the forefront of modern mathematical physics. An obvious omission is a chapter on variational and perturbation methods. However all books have to be ended more or less arbitrarily, and the author cannot be seriously faulted for her choice of subject matter in this case.

The examples in the book range from a few very elementary problems to more difficult and interesting ones. An example of the former is the orthogonalization and normalization of the first few polynomials with respect to a given weight function in a given interval (construction of Laguerre polynomials). Fortunately the latter type of problem is in the majority. In all cases the problems are well stated and the solutions constructed in sufficient detail to be useful to the student. At times the author finds it necessary or convenient to introduce certain definitions. This is generally integrated smoothly into either the statement of the problem or the discussion of the solution. When a more detailed discussion is required, as in the case of unitary operators, the author retains the basic tenet of the book by stating as a problem: "Give the . . . properties . . . of a unitary operation . . ." The solution is the discussion needed to understand the examples which follow and involve various properties of this class of operators.

This book originally appeared in French, and the present translation into English is an excellent job. Only in very occasional instances would this reviewer suggest any changes in the translation, such as the use of "eigenvalue" rather than "proper value" and "Dirac delta function" instead of "Dirac measure . . . limit in the sense of distributions . . .". Since this book is intended for applied scientists, it would seem desirable to use their jargon in the translation. From the overall quality of the translation, however, it is probably true that this was not an oversight but rather a deliberate choice on the part of the translator.

The book has one major fault. It contains far more misprints than can be excused as inevitable in the publishing process. For the experienced reader this is more a nuisance than anything else, but many of these could cause considerable difficulty for the student. It is hoped that the book will be carefully edited before any reprinting, and that an erratum will be distributed with those already off the press. Aside from this criticism, the book is well done. Although it is intended primarily for students, it should be of more than passing interest to the practicing scientist, engineer and applied mathematician.

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The reviewer is a physicist with the General Dynamics Corporation.

Best suited for nuclear physics

INTRODUCTION TO THE QUANTUM THEORY OF SCATTERING. By Leonard S. Rodberg, Roy M. Thaler. 398 pp. Academic Press, New York, 1967. $11.50

by John L. Gammel

The most startling thing about this book is that it contains no references to the literature other than a statement in the preface that references may be found in the book by M. L. Goldberger and K. M. Watson[1] and the one by T. Wu and T. Ohmura.[2] The authors excuse themselves on the grounds that the treatment is self contained and highly personal. I believe that a better reason is that the authors are lazy. What is self contained or highly personal about the following? A differential equation, numbered 5.10 on page 64 of the text, is "readily identified as a hypergeometric equation whose regular solution is. . . ." The result shown in equation 5.13 for the asymptotic form of the hypergeometric function came from somewhere: where?

Having disposed of this disquieting point, I suppose that it is best to proceed by comparing this book with those of Goldberger and Watson,[1] Wu and Ohmura,[2] and the recent one of Roger G. Newton.[3] The book can even be compared with the first edition of the book by N. F. Mott and H. S. W. Massey.[4] There is a great deal else available in book form, a