scattering amplitude. Since the smallness of H' is difficult to formulate and a rigorous treatment of the analytic structure of the scattering amplitude is hard to provide, it may be remarked that a treatment of a single-level formula with slowly varying background for a finite number of channels employing complex energies may be found in a 1940 paper (*Phys. Rev.* 58 1068, 1940) and concrete examples showing the failure of the relationship between the total width and the competition factors (Equation 3F-16 of Volume 1), under well defined conditions, may be found in a 1946 paper (*Phys. Rev.* 69 472, 1946) and other related and more extensive work has been carried out more recently by Moldauer. The former of these references assumes slowness of energy variation of relative wave-function values in and close to the nuclear interior. This condition is easier to deal with than the smallness of H', the criterion depending on relative values only.

There are occasional ambiguities of expression and slips of the pen, for example, on page 108 in the ninth line under Equation 1C-9 is found "quadratic blocks along the diagonal." There are two diagonals in square matrices. But such matters seldom worry physicists.

Judging by Volume I the "book" is promising, especially as a compendium of information valuable to those who wish to study nuclear levels and their properties, fitting the needs of each set of levels to one or another model.

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Lightning

By Martin A. Uman
(Advances Monograph Series) 264 pp.
McGraw-Hill, New York, 1969. $13.50

A comprehensive survey of our present knowledge of lightning has been wanting in our libraries for many years. This present volume fills this lack in an admirable way. The two recent books on this subject, one by B. Schonland and the other by his coworker Malan, have dealt primarily with the South African work on this subject, and neither was comprehensive in its treatment nor bibliographically complete enough to guide students to the current literature.

Martin A. Uman, who is continuing his research on long laboratory sparks at the Westinghouse Research Laboratories, has carefully analyzed all the modern work and has referenced his chapters with a very full bibliography. The book is also made pleasant reading by a carefully selected background survey of each subject, including pertinent epigraphs from relevant historical sources.

The treatment of the subject is mainly by diagnostic technique. This is varied only by an introductory chapter that defines subject matter and terms and a final chapter presenting the various theories of the discharge processes. The author has therefore grouped various classes of experiments together and provides the reader with a logical and constructive way of understanding sometimes conflicting reports.

In anticipation of another edition, Uman offers himself as a clearinghouse for unpublished as well as published reports on lightning. He also suggests for each diagnostic technique what, in his opinion, further work using these particular techniques should be. Because our understanding of the subject is still so incomplete, it is satisfying to look forward to sequels of this book as more information about the subject matter unfolds.

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Electron Optics

By Bohdan Paszkowski
305 pp. American Elsevier, New York, 1969. $13.00

The first book on electron optics appeared in Germany in 1934. In the intervening 35 years many books have been published on the subject in many different languages. But quality is uneven; some of them are very good, others are not. The English-language literature possesses some of the best ones, yet the same can not be said of B. Paszkowski's book. Under these conditions I fail to understand why this book has been translated into English and published.

The author states in the preface: "The material . . . grew out of lectures given . . . over a decade . . . for students in the Electronics Faculty, Warsaw Technical University." The