scribes briefly other methods such as acoustic-wave modulation, saturable dyes, etc. This chapter lacks a bit in depth; one would have expected to learn more about the less usual methods. The last chapter deals with optical resonators. The main emphasis is on spherical mirror systems, on beam radius and on propagating modes. Diffraction losses and mode selection are briefly discussed. The chapter closes with a review of lenses in optical resonators. Very helpful for the propagating-mode discussion is a selection of references.

In the reviewer's opinion the actual values of the different chapters vary very much. The critical review chapters on ruby, rare-earth and organic lasers provide not only an extremely good overview of the fields covered but also successfully compare different systems, review them critically and draw conclusions from such a comparison. They also show a way and a must for future research. The other parts, about a quarter of the total content of the book, are quite helpful but by no means so thoroughly treated as are the first three chapters.

Summarizing one can say that this book is, despite my criticism, a very important and also stimulating publication on lasers. I await with interest the following volumes of this new series which, I hope, will be on the same line and edited with the same care that has been taken with this volume.

* * *

H. J. Hagger is with Albiswerk in Zürich.

Looking it up

FORMULAS AND THEOREMS FOR THE SPECIAL FUNCTIONS OF MATHEMATICAL PHYSICS. (3rd edition) By Wilhelm Magnus, Fritz Oberhettinger, R. P. Soni. 508 pp. Springer-Verlag, Berlin, 1966. $16.50

by Eugene P. Wigner

It must be difficult to write a good collection of formulas and theorems; it surely is difficult to review one. This book is not meant for reading: It quotes theorem upon theorem without proof and hardly can hold the interest of any reader. It is not meant to be

harper's physics series

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with examples from solid state physics

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solid state and semiconductor physics

JOHN P. MCKELVEY. "This is one of the best of several textbooks to be published in the last few years on solid-state physics and semiconductor devices and material. The author is a gifted writer and has succeeded in presenting a clearly written treatment of selected topics involving both theory and application of theory. The level is suitable for seniors and beginning graduate students in either electrical engineering or physics. Although the book can best serve as a text for a course, it has been written with sufficient clarity to be of substantial value to working engineers who are relatively new to the field and who wish to learn it on their own. It may also serve to a limited extent as a general reference book for those workers who are already involved in semiconductor research and development.

All in all, the book is extremely impressive as a text for electrical engineering students. It is well written and seems to contain just the right blend of theoretical and applied material. As such, it should be of great interest to electrical engineering professors who are in search of textbooks in this area." *IEEE Spectrum*

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used that way. Rather, I believe, it is meant to remind one of a formula with which one is already vaguely familiar and give its exact form, including the constants which one is likely to forget.

Personally, I have never succeeded in using a book such as the present one because, in the absence of a derivation, I always felt unsure of the range of validity of the equation. Also, without the derivation, the formulas appear to me lifeless, not expressions for an actual relation. Surely, I am not typical and others have greatly benefitted from collections of formulas of this nature. I opened the book at random and was confronted with the formulas for integral transforms. The first two, the Fourier sine and cosine transforms, were familiar to me; but I wonder whether the reader who is unfamiliar—and for whom, presumably, the formulas should be useful—can guess what their range of validity is in the cruder sense (x, y real and positive) and what their range of validity is in the more subtle sense, as square integrability or continuous nature of the functions. Neither type of condition is mentioned. Only the second, and perhaps for a physicist less serious, problem arises with respect to the third example, the exponential Fourier transform. The first type of problem returns, however, with the fourth example, the one-sided Laplace transform. In addition, the second formula contains a constant c, the meaning of which is not stated and its position with respect to the singularities not given. The same applies to the fifth example, the two-sided Laplace transform. If one is not familiar with these formulas, particularly that for the one-sided Laplace transform, it is definitely misleading, as a comparison with the formula for the two-sided Laplace transform reveals. I dare not criticize the other six examples because I am not sufficiently familiar with the transformations involved. However I surely would not dare to use them.

A few pages further on, where a great number of explicit formulas are given, the criticism is surely inapplicable. The authors are distinguished mathematicians who know their subject very well, and this reviewer is sure that their book will be used to great advantage by many. Nevertheless, this reviewer continues to believe that collections of formulas would be more useful if a reasonably serious attempt were made to specify the range of validity of all the equations and to provide some little background for them. For total given page number, this would require some restriction on the number of subjects treated. Opinions will differ whether it would be worth taking such a restriction into the bargain.

* * *

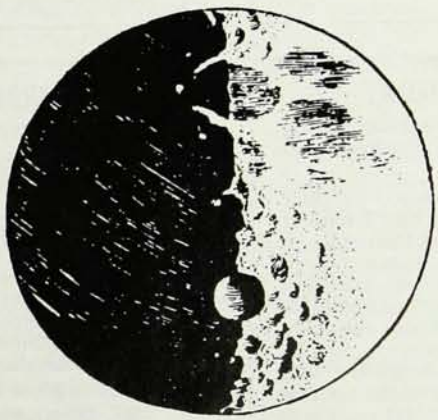
The reviewer is professor of physics at Princeton University.

Have you read . . . ?

GALILEO GALILEI: HIS LIFE AND HIS WORKS. By Raymond J. Seeger. 286 pp. Pergamon Press, Oxford, 1966. Paper $3.50

by M. W. Friedlander

Students of literature read the classics of their languages, but how many physicists have read Galileo, Newton or Maxwell? The book under review is one of a new series, *Selected Readings in Physics*, in which over a dozen books have so far appeared. "The purpose of the series. . .is to present a set of reasonably priced books which give. . .reprints of those papers which record the development of new ideas. . . ." One can go further: Not only is it good for students to see the development of their subject but also to sample styles that are mercifully far removed from most of today's jargon and pomposity. How often do we find among the acknowledgements to a paper one such as that by Maxwell: "Mr. Gassiot, with his usual liberality, placed at my disposal his magnificent battery of 2600 cells charged with corrosive sublimate."? Instead, we have to suffer through "The audience for these studies are biological and physical scientists, working under the canvas of many important Government programs, who are willing to share in or partake of the adventure of helping a biological systems science to burgeon." (From a NASA report.)



THE MOON. This drawing was made by Galileo from telescopic observations.

Unfortunately there are probably few physicists who have read Galileo's works. Modern editions are available (some in paperback form), but the leisurely pace of exposition makes random sampling inefficient though enjoyable. Selections have appeared in various anthologies, but the volume under review is unique because it presents, with care in selection and with annotations, many selections in a single booklet.

Raymond Seeger has written extensively on Galileo and has performed a fine service with this collection. I can well imagine using it as an adjunct to courses in the history of science, and I shall probably use sections of it myself in a course for nonscience majors. Since most of the book consists of Galileo's writings, my comments are in the main on the actual choice and on the notes.

Four introductory chapters set the stage by discussing Galileo's career, both scientific and political. These sections are brief—perhaps a shade too brief—with a total of only 37 pages. For instance, when mentioning the 1604 nova (p. 12), he could have appealed to modern interest by pointing out that this is now known as Kepler's nova; as one of the strong radio sources and one of only three recorded supernovae in our galaxy, it is an object of considerable interest. The description of Galileo's troubles with the Church can hardly be more than an outline, but I am surprised that there is no mention that an additional factor was Galileo's choice of popular Italian rather than scholarly Latin for his major work.

The discussion on Kepler and the invention of the telescope (p. 15) is misleading: It seems as though Kepler's failure to construct his own device prevented him from making ob-