gases. The next two chapters give a very extensive treatment of the theory of relaxation phenomena (H.-J. Bauer) and of relaxation processes (H. O. Kneser) in gases. The discussions in these two chapters include an introduction to the fundamentals of irreversible thermodynamic processes and a very lucid description of single and multiple relaxation processes. Various examples and some new calculations are given. One also finds a discussion concerning the dependence of the relaxation time on a number of constants of the molecules as well as a description of the different types of relaxation, e.g., vibrational and rotational. Many absorption and dispersion curves are included which help to illustrate the various processes involved.

The second part of the book is devoted to relaxation phenomena in liquids. Chapter four (J. Lamb) is concerned with the theoretical aspects and some experimental results of thermal relaxation, i. e., processes which result from temperature variations produced within an ultrasonic wave. Absorption phenomena are interpreted in terms of relaxation processes and are used to investigate very fast chemical reactions. Again, numerous plots of experimental results support the theoretical analysis. Two further, very important relaxation phenomena in liquids are discussed in the fifth chapter (T. A. Litovitz and C. M. Davis) which is concerned exclusively with shear and structural relaxation. The authors give a comprehensive evaluation of the theories of structural viscosity, elastic moduli of liquids, the influence of temperature and pressure, and of volume and shear viscosity so that it becomes possible to understand and interpret velocity dispersion and absorption data in terms of structural and shear relaxation. The last chapter (J. Stuehr and E. Yeager) is concerned with the influence of the structure of electrolytic solutions on ultrasonic velocity and absorption measurements. Many experimental results are given which show interesting relationships between propagation characteristics of ultrasonic waves, including relaxation times, and the chemical properties of the solution.

This book is indeed an excellent source of information not only for the physical acoustician but also for the thermodynamicist and the physical chemist interested in the gaseous and liquid states of matter.

Fundamentals of Vacuum Science and Technology. By Gerhard Lewin. 248 pp. McGraw-Hill, New York, 1965. $11.50.
Reviewed by L. Marton, National Bureau of Standards.

I always find it useful to search in books for the clues for whom the book is written, and usually the preface gives this kind of clue. Dr. Lewin states in his preface, "This book is primarily intended to serve those who have a general background in physics or engineering but are not familiar with vacuum technique. . . ."

A brief survey of the contents shows considerable emphasis on vacuum measurement and pumps. Eighty pages of the 240 are dedicated to these two items alone. Next important is the treatment of surface effects, with close to 60 pages devoted to it. The physical basis of the kinetic theory of gases and the flow of gases through orifices and tubes, is treated at the beginning in about 20 pages. The rest of the book is mostly specialized technology.

Just out of curiosity, I looked over the references and then plotted them to give myself an idea about the distribution over the years. I found that there are hardly any references given before 1950. With 1955 they start rising and show an almost exponential growth until 1962. The 1963 references, instead of showing an increase as expected, are reduced to about 60 percent of the '62 references, with hardly any references in 1964. The obvious conclusion from this kind of statistical study is that the cut-off date of the manuscript must have been almost two years before the publication date. As this is a rather frequently occurring phenomenon, I find it unfortunate and I wonder if something couldn't be done by a concerted effort of all publishers (and of authors) to reduce the lead time.

Speaking of references, I would like to object to the use of unpublished reports. A characteristic example of this kind is reference 46a

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T. J. Hughel, editor. Deals with basic theories as well as advances in the liquid state. *Proceedings of 7th Annual Symposium at General Motors Research Laboratories in 1963.* *1965* $20.00

TOPICS IN APPLIED MECHANICS

D. Abir, et al., editors. A collection of original scientific and engineering contributions in the field of applied mechanics. *1965* $16.00

ELECTROTECHNICAL DICTIONARY

W. E. Clason. 7,100 terms in Engl./Am., Fr., Sp., Ital., Dutch, and Ger. deal with various aspects of electrical engineering. *1965* $25.00

The following three books are at the post-graduate and reference level in the area of mathematical physics.

MATHEMATICAL CRYSTALLOGRAPHY

M. A. Jaswon. A fresh treatment of the subject based on postgraduate lectures. Elementary group theory is utilized; numerous diagrams support arguments. *Oct.* $6.00

INTRODUCTORY QUANTUM ELECTRODYNAMICS

E. A. Power. This book deals with 'non-covariant' quantum electrodynamics. The radiation field is also discussed *1965* $6.00

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A. Roussopoulos. A general analytic study of structures based on the laws of elasticity. Important new theorums are arrived at using matrix methods. *1965* $12.50

PROGRESS IN RADIO SCIENCE 1960-1963

An examination of various major spheres of radio science presented to the XIVth General Assembly of URSI. Reports to the Commission are available in individual volumes as listed herewith:

Vol. 1. William Beatty, editor. Radio Standards and Measurements. 1965 $ 9.00
Vol. 2. F. duCastel, editor. Radio and Troposphere. 1965 $16.00
Vol. 3. G. M. Brown, editor. The Ionosphere. 1965 $13.00
Vol. 4. F. Horner, editor. Radio Noise of Terrestrial Origin. 1965 $10.00
Vol. 7. R E. Burgess, editor. Radioelectronics. 1965 $11.00
Vol. 8. Ken-Ichi Maeda and Samuel Silver, editors. Space Radio Science. 1965 $13.50

in the chapter on vacuum measurements. The text says: "The ions can be focused onto an electron multiplier by a Wein-type electrostatic lens which brings the ions out of the magnetic field into the shielded multiplier (Ref. 46a)." In looking up this reference, it turns out to be a Westinghouse report. The trouble is that I don't have the slightest idea what a Wein-type electrostatic lens is. I have a strong suspicion that it may be a Wien filter, but in absence of published information I cannot check this point.

Still on the subject of references, it is significant that older references are simply omitted. A characteristic example is, for instance, page 216 where the author refers to the "housekeeper" seal. I would not quarrel with the fact that "housekeeper" is spelled with the lower case "h", although it means the name of the inventor. It is true that since Mr. Housekeeper invented it, it has become a household word, and therefore maybe it is justified to omit the capital from his name. While a reference would show the origins of this kind of seal, from the point of view of the author it is apparently much too old to be used.

Lewin's book is recommended as an easily readable introduction to the subject, and as a guide to more advanced reading.

Progress in Biophysics and Molecular Biology, Volume 13. J. A. V. Butler, H. E. Huxley, and R. E. Zirkle, eds. 328 pp. Pergamon, Oxford, 1963.
Reviewed by Joseph G. Hoffman, State University of New York at Buffalo.

Through the previous twelve volumes, this series was entitled: *Progress in Biophysics and Biophysical Chemistry*. The preface to Volume 13 points out that there is no change of editorial policy, and that molecular biology will continue to be the general subject matter of the series, with particular emphasis on heredity, protein synthesis, and muscular contraction. The wide range of topics attainable under these subjects is illustrated by the six papers in this volume: radiobiology, small-angle x-ray scatter analysis, nucleic-acid synthesis, enzyme inactivation, solute translocation in plant stems, and the