braries of all those who have an interest in the experimental study of the atomic arrangements in single crystals.

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Probabilistic and statistical problems

AN INTRODUCTION TO PROBABILITY THEORY AND ITS APPLICATIONS. VOL. 2. By William Feller, 626 pp. Wiley, New York, 1966. $12.00

by T. Teichmann

The first volume of Feller's *An Introduction to Probability Theory and its Applications* set a new and welcome trend in the field by combining mathematical rectitude with practical applicability in a manner satisfying both to purists and to those interested in applying results. Its many readers, most of whom had probably given up hope of seeing volume 2 will welcome its somewhat unexpected appearance, after some sixteen years, and find that the wait, if lengthy, has been worthwhile.

This second volume embraces a variety of topics connected with continuous sample spaces. It includes lengthy discussions, both abstract and applied of the most "popular" densities (to wit, a uniform, an exponential and a normal, and their extension to more than one dimension). The basic measure-theoretic foundation of the theory is given, followed by the general properties of distributions and moments in multidimensional spaces. The remainder of the book then involves interrelated discussions of important subjects in probability theory together with important applicable techniques in analysis. The probabilistic subjects include the laws of large numbers, the central limit theorem, infinitely divisible distributions, Markov processes, random walks and renewal theory. The techniques include Laplace and Fourier transforms, semigroups and general harmonic analysis. It is not practical to list all the significant problems treated or discussed, and even those treated quite cursorily often give applicable results or criticisms.

The concentrated information presented in this volume is alleviated by the conversational (and sometimes mildly ironical) style of its presentation and by the frequent interposition of examples of both mathematical and statistical interest, including many left for the reader. This book will prove interesting and helpful to almost everyone concerned with probabilistic or statistical problems that are not completely elementary, and its readers will be grateful to Feller for his perseverance and enthusiasm in completing his venture.

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Dynamical theory of diffraction

MICROSCOPIE ELECTRONIQUE DES LAMES MINCES CRISTALLINES. By G. Saada. 324 pp. Masson, Paris, 1966. 76 F.

by L. Marton

A few months ago I had the pleasure of reviewing in these columns a book by P. B. Hirsch, A. Howie, R. B. Nicholson, D. W. Pashley and M. J. Whelan entitled *Electron Microscopy of Thin Crystals.* It is no accident that almost simultaneously another book appeared on the same subject by a French author.

For many years the electron microscope was an instrument used by practically no one but the biologists and sometimes the chemists. Gradually it was accepted by the metallurgists as a useful tool, but it was hard to convince any physicist that the electron microscope would be useful to the physicist. Maybe the explanation is that most of the phenomena in which the physicist is interested were somewhat below the resolving power achieved in the early microscopes, and that only the recent development of improved resolution of the microscope has made physics research accessible to the instrument. Whatever the cause may be, I am happy to report that the situation is very rapidly changing and the almost simultaneous appearance of these two books is a good sign of the acceptance of the electron microscope by the physicist.

I do not want to imply that the improved resolution of the electron microscope alone is responsible for this new development. The development of the dynamical theory of diffraction was one of the prime reasons why interpretation of the electron micrographs of crystalline matter became possible, and without interpretation, none of the experimental results would

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have any value. It was a very happy coincidence that these two developments occurred almost simultaneously, paving the way toward this new application of the electron microscope.

In judging the present book, comparison with the previously reported one is unavoidable. I praised the book written by Hirsch and his collaborators very much, and now after looking at the book by Saada, I am even more inclined to praise the first book. Whereas the book by Hirsch et al was written by people actively engaged in the development of the field, Saada writes more from the sidelines. As far as I know, he is a specialist on lattice defects and thus he discusses the various types of lattice imperfections a little more systematically, from the point of view of dislocation theory, than does the book by Hirsch et al. On the other hand, Saada has not, to my knowledge, contributed much original work to the subject of the present book. This in itself may not be a disadvantage. I have seen excellent reviews written by people who have started out fresh into a new field and were obliged to collect material for their own benefit. The present book, however, may be of less benefit to the electron microscopist wishing to interpret his pictures, than the book by Hirsch because it is written from a considerably more formalistic point of view. The author seems to be more interested in the mathematical development of the dynamical theory than its precise application to the interpretation of electron micrographs. The book is profusely illustrated with electron micrographs, which are there for the purpose of illustrating the theoretical points. I am afraid the correlation sometimes is not very clearly established, and the practical electron microscopist may be lost between the mathematical development and its application to the image he is observing. This remark does not apply to the "metal physics" part, which is quite good.

A cursory look at the references shows that the bibliography was not prepared very carefully. As an example, one particular book is referenced with both the year and the publisher being wrong.

Summarizing, I may say that while this is a good guide book for identifying unknown details, it suffers from comparison with an even better book. If it hadn't been for the appearance of the book by Hirsch and his friends, this would have been most welcome. As it is, it is a good second choice.

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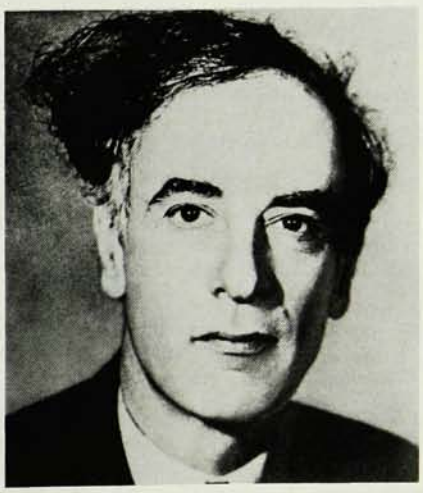
Landaus' work, with commentary

MEN OF PHYSICS: L. D. LANDAU. Vol. 1, Low Temperature and Solid-State Physics. By D. ter Haar. 196 pp. Pergamon Press, Oxford, 1966. Paper $2.95

by R. B. Lindsay

It has been pointed out with some justice that students of physics, both undergraduate and graduate, tend to concentrate their attention on the standard textbooks and rarely look with enough care at the current periodical literature until they get well into their professional research. There are, of course, good reasons for this, the principal one being that the research articles in the journals are not written primarily for students but for other experts in the field and are therefore in general very difficult to read with real understanding. It is with the view to remedying this situation that Pergamon Press has inaugurated a series of "Selected Readings in Physics," which present in a variety of fields reprints of key papers, together with editorial comment to render their reading more meaningful to the student. Moreover the aim has been to keep the price low enough to make their purchase feasible by the average student.

The present volume is illustrative of the purpose of the series. In it the editor Dirk ter Haar has gathered eight important papers by Lev D. Landau on the theory of liquid helium, superconductivity and solid-state physics. This collection is prefaced by 50 pages of explanatory material reviewing the essential points in the papers and providing an excellent introduction for the understanding of Landau's work. A second volume is promised with twelve more papers on such fields as phase transitions, stellar energy, cosmic rays, indeterminacy in quantum mechanics, plasma physics and quantum field theory.



LANDAU

The scope of Landau's original contributions to theoretical physics, as exhibited in this volume, has been amazingly wide. Whatever he has touched he has illuminated with profound imaginative power. His writing also is very lucid. Nevertheless the student will find ter Haar's commentary very helpful in providing the necessary appreciation for the finer points. The discussion of liquid helium is supplemented by a brief account of Fermi liquids in general. The solid-state papers in the volume refer entirely to magnetism, including both diamagnetism and ferromagnetism. The book contains a complete bibliography of Landau's books and articles, as well as a brief list of relevant references to other authors. There is a frontispiece portrait of Landau. It is regrettable that the very brief biographical sketch could not have been expanded.

The editor and publisher are to be congratulated on the appearance of this useful volume.

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R. B. Lindsay, who is Hazard Professor of Physics at Brown University, writes frequently on the history and philosophy of physics.