Book Reviews

New Series in Physics

Studies in Statistical Mechanics. vol. 1. J. De Boer and G. E. Uhlenbeck, Eds. North-Holland, Amsterdam; Interscience (Wiley), New York, 1962. x + 350 pp. $13.75.

This is the first volume in a series of studies on statistical mechanics. The editors emphasize that, by the term *studies*, they mean not only summaries of recent research in the field but also critical accounts of the older classical material that constitutes much of the existing body of knowledge in the subject. The idea is a good one. Such studies can do much to bridge the gap between the customary textbooks and the research literature, and in this volume the editors have included, as part A (approximately one-third of the book), E. K. Gora's translation from the Russian of N. N. Bogoliubov's well-known *Problems of a Dynamical Theory in Statistical Physics*. This translation, which was partially supported by the Geophysics Research Directorate (Air Force Cambridge Research Center, Air Research and Development Command), has been out of print for some time. Although another translation (AEC-tr-3852) of this classic work is presumably available from the Office of Technical Services, I feel that the Gora translation is scientifically much more accurate and that its inclusion in this volume is fully justified.

Part B, on the theory of linear graphs with applications to the theory of the virial development of the properties of gases, was written by G. E. Uhlenbeck and G. W. Ford. Here is an excellent account of the application of topological methods to the problem of the equilibrium classical statistical mechanics of gases, which can be highly recommended to all serious students of the subject. Graphic methods in recent times have been successfully applied to quantum statistical mechanics and to nonequilibrium statistical mechanics. It is to be hoped that future volumes in this series will contain accounts of these interesting topics. It is not clear from the text when Uhlenbeck and Ford's article was written. Apparently there are no references to literature later than 1956.

Part C, written by H. Mori, I. Oppenheim, and J. Ross, is a good account of the Wigner distribution function and its application to transport theory. The article was essentially completed in 1959 and is therefore a little out of date. Although at present it is not known which bricks will pave the road to nonequilibrium statistical mechanics, those related to the Wigner distribution function methods seem to be as good contenders as any. The authors modestly present their account as a personal one—one which is not intended to be exhaustive or critical.

Part D, by M. Dresden, "A study of models in nonequilibrium statistical mechanics," is devoted to a study of certain simplified models in statistical mechanics. Historically, models have been studied because the study of real systems was beset by insurmountable mathematical difficulties, but the study of models is by no means mathematically trivial. Although some basic difficulties in statistical mechanics have been clarified by this approach, the method does not appear to get at the roots of the problem. Dresden's article is well written, but here again, it is not clear from the text when it was written. The latest citation appears to be dated 1958.

The book has a good index. Unfortunately the price is somewhat high.

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Geology of Australia

The Geology of Queensland. D. Hill and A. K. Denmead, Eds. Melbourne University Press, Melbourne, Australia, 1961. xiii + 474 pp. Illus.

This volume, the third in a series of geologic summaries of Australian states published by the young and vigorous Geological Society of Australia, was written for the centenary celebration of Australia's second largest state, Queensland. Its timeliness could hardly have been foreseen by the editors: the book preceded, by about 1 year, the discovery of the continent's first commercial oil field, the Moonie, in southeastern Queensland.

Queensland covers about 750,000 square miles, and its geology is complex. The slow growth of geological knowledge in earlier decades was succeeded by an unpredictably explosive expansion of exploration and geological mapping during the last 20 years. In these circumstances the most unusual, and perhaps the most valuable, aspect of the book is its extensive utilization of previously unpublished information. More than 4 pages of a 20-page list of references are filled with titles, including depositories, of unpublished reports. In addition, there are liberal quotations from "personal communications" throughout the text.

Fifty-two geologists cooperated in this venture, and this multiplicity proves to be both a strength and a weakness. On the one hand, the volume is as authentic a piece of regional geology as any that has been compiled in recent years for any area of comparable size; on the other, the text appears disjointed in many places, and overall synthesis and historical perspective are lacking.

The book opens with an excellent, though all too short (19 pages), chapter (by D. Hill) on the geological structure of Queensland. The remaining contributions, about 150 in all, are arranged according to divisions of geologic time from Precambrian to late Cenozoic, with two additional chapters headed "Laterites" and "Clays." Within each period the treatment is on a regional basis, and the material is presented in the form of eight to twelve individual contributions, many of them written by joint authors (with divided responsibilities). Each contribution describes competently and precisely the rocks of one restricted area, but for individual