

treatise contained the only positive presentation of Einstein's theory of gravitation in the Germany of 1933-1945, which may partly, though not entirely, account for its success at that time. Yet it has more lasting merits than that.

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Racah and company

SPECTROSCOPIC AND GROUP THEORETICAL METHODS IN PHYSICS. (Racah Memorial Volume). F. Bloch, S. G. Cohen, A. deShalit, S. Sambursky, I. Talmi, eds. 462 pp. Wiley (Interscience), New York, 1968. \$22.00

by DON B. LICHTENBERG

One of Giulio Racah's most important contributions to theoretical physics was his application of powerful methods of group theory to problems involving angular momenta. His work on the recoupling coefficients that bear his name contains, together with the parallel work of Eugene Wigner, many fundamental ideas on the subject.

It is therefore fitting that this volume, in memory of Racah's untimely death in 1965, begins with four contributions to the theory of Racah coefficients and the corresponding Wigner symbols. These papers explore a few of the many fascinating mathematical properties of Racah coefficients, such as their semiclassical limit for large values of all relevant angular momenta and their connection with states with permutational symmetry.

The complete book consists of 25 separate contributions by 38 of Racah's friends and colleagues on a variety of subjects. A number of well known physicists are among the authors, including Wigner, who has written on some aspects of group representations, and Yuval Ne'eman, who has emphasized the role of Lie groups in strong-interaction physics.

The individual works fall roughly into three categories: theoretical papers of some mathematical interest, and some that apply known concepts to problems in nuclear and elementary-particle physics and experimental

papers in atomic and nuclear physics. In addition, a paper by Abraham Pais gives a short historical review of our knowledge of invariance principles in physics.

Most of the articles are of high quality. A few, especially on elementary particles, already contain some obsolete material, a fact that testifies to the impermanence of many theoretical ideas in this field. However, even these articles contain items of current interest.

For whom is this book intended? The book contains a collection of articles that, with only a few exceptions, are suitable for the *Journal of Mathematical Physics* or for *The Physical Review*. The papers are on the average somewhat higher in quality and are more closely related in topic than the usual journal article. The abundant references to Racah's works and praises of this work are further departures from a typical journal paper. But, most important, this collection advances our understanding of physics in the areas that Racah contributed to so much.

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A professor of physics at Indiana University, the reviewer has been interested in the applications of group theory to elementary-particle physics.

Counting configurations

PRINCIPES DE COMBINATOIRE. By C. Berge. 149 pp. Dunod, Paris, 1968. 34F

by FRED L. WILSON

Arrangements are configurations, and counting configurations possible within the given constraints is what this book by Claude Berge is all about.

The author has been director of the International Computation Center in Rome, Italy since 1964. Probably his best known work is *Théorie des Graphes et Ses Applications*, published in 1958.

The present work is concerned only with denumerment, counting the number of configurations, rather than with enumeration, or listing the configurations. It is written in modern terminology, without using symbolic calculus. Berge's applications are drawn from the relatively new domain of information theory rather than from the theory of numbers.

The text of this book was the mate-

rial for a course taught at the Faculté des Sciences de Paris in 1967-1968. It could be used in a graduate course, provided the language barrier could be overcome, but is also an excellent reference book that is well illustrated and has an excellent bibliography of modern literature for each chapter. It could be read simply for pleasure.

* * *

Fred L. Wilson is the educational specialist, College of Science, National Technical Institute for the Deaf, at Rochester Institute of Technology, and academic coordinator for deaf students majoring in physics, mathematics, biology, chemistry and medical technology.

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