Book Reviews

Beta Decay for Pedestrians. By H. J. LIPKIN. North Holland Publishing Co., Amsterdam, 1962. viii + 117 pp. $6.00

The title of Professor Lipkin's little book may perhaps carry some unwarranted implications to members of the American Nuclear Society, many of whom are not experts in beta decay. It might be well, therefore, to say at the outset what the book is *not*. It is not, on the theoretical side, a general survey of, or introduction to, beta decay theory. On the experimental side, it is not a description or survey either of beta decay experiments or experimental techniques. It is not a beta decay handbook. It is not, in short, a work which will painlessly introduce the reader to the subject of beta decay or which can be used as a reference in the solution of experimental or theoretical problems of practical interest.

With this *caveat* out of the way, let us see what the book *is*. It is the substance of several sets of lectures given by the author in recent years, stimulated by the discovery of parity nonconservation in beta decay. Professor Lipkin has set out to investigate to what extent the interpretation of various polarization and angular correlation experiments is independent of formal beta decay theory, and the reader will probably share the author's "surprise and delight" in seeing how far one can go using only the simplest of physical and mathematical ideas. The reason for this is that many of the features of beta decay turn out to be simple, almost trivial, consequences of conservation laws and are amenable to treatment by the vector model. The argument, in general, requires no more formal background than an acquaintance with elementary quantum mechanics.

Chapter I sets up a simple vector model of the electron and neutrino states, and introduces the notion of helicity. In Chapter II the conservation laws are stated and the initial and final states are specified. Chapter III discusses Fermi and Gamow-Teller transitions and interference effects. Chapter IV discusses more general properties of angular momentum. Chapter V discusses the interpretations of several types of experiments, and Chapter VI contains a further discussion of the connection between the simple vector model and formal beta decay theory.

This book will be of most interest to those who already are acquainted with the subject of beta decay; to them it presents the subject in a fascinating new light. To those who have little or no acquaintance with beta decay it can be recommended with the understanding that a close reading will be required. The effort, however, will be well rewarded.

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(About the Reviewer: Rudolph Sher obtained his Ph.D. in physics from the University of Pennsylvania in 1951. He was at Brookhaven National Laboratory from 1951 to 1961, first in the experimental reactor physics group, and later in charge of the reactor cross section evaluation group. Since January, 1962 he has been Associate Professor of Nuclear Engineering at Stanford University.)