chapters summarizing the three main sections of *Fundamental Theory*, and many useful footnotes.

Dr. Slater has performed this enormous task with great care and competence. He is able to tell us much about the development of *Fundamental Theory*. Here is the raw material for the writing one day of one of the most fascinating stories in the history of science, though whether it will be a triumph or a tragedy that will be written we do not know. It will take a great deal of study to assess how much he has been able to help us to understand the meaning of *Fundamental Theory*. No miraculous clarification could be expected and all the old uses of the familiar in contexts that are unfamiliar, inappropriate, or contradictory remain.

Eddington expected that his theory would be judged mainly by its success in predicting the pure numbers of Nature. Our picture of the physical world today is much more complicated than it was in 1944. There are many new particles whose masses Eddington did not predict. Perhaps he would reply that these are not fundamental particles but compounds and that his theory only dealt with the fundamental particles. The most striking discrepancy is between his calculated value of the fine structure constant and its measured value. If he were alive today he would no doubt be able to find some more factors of 136/137 which had been forgotten and which made it right, but would this be a refinement of the theory or a numerical "fudge"? It is with this curious mixture of distrust and admiration that we still approach *Fundamental Theory*.

Science and Human Life. By J. A. V. Butler. 162 pp. Basic Books, Inc., New York, 1957. $3.95. *Reviewed by R. Bruce Lindsay, Brown University.*

It is by no means a new thing that the success of physical science has stimulated the application of the scientific point of view to all aspects of human life. Yet it must be admitted the process is accelerating rapidly in the present age and confidence in science as a method of description of experience in every sphere is growing apace. The writer of the present book, a well-known physical chemist and biophysicist, has attempted an assessment of the success of the program; this should be of interest to all physicists who can take the time to look for a moment beyond their specialized research.

The author carries the reader on a very considerable excursion, from the method of science in the study of the inanimate world, through the application of physics and chemistry to living organisms including man, and finally to the study of man in society. It is presumably inevitable that such a broad canvas should betray a certain superficiality of treatment and the work has not escaped this drawback. However there are some very shrewd judgments clearly expressed, particularly with respect to the difficulty of attacking the problem of mind in terms of the concepts of physical science and the role of science in ethics and religion. It is indeed unfortunate that the writer does not provide at the beginning of his book a more adequate elucidation of the

nature of physical science. This lack detracts from the effectiveness of his whole subsequent treatment. No attention is paid to the role of the statistical method in the understanding of the social relations of man and in an otherwise suggestive treatment of imagination in human life what is perhaps the most striking illustration of the imaginative faculty, namely the creation of the great scientific theories, is just barely mentioned in passing.

This book will serve a very useful purpose if it stimulates in the reader a desire to probe more deeply into the possible significance of human life described in scientific terms.

Games and Decisions: Introduction and Critical Survey. By R. Duncan Luce and Howard Raiffa. 509 pp. John Wiley & Sons, Inc., New York, 1957. $8.75. *Reviewed by T. Teichmann, Lockheed Missile Systems Division.*

Game theory and decision theory have become very popular topics, both among mathematicians and mathematical sociologists, since the war. Game theory, for its part, has served to stimulate a revival of interest in the topics of inequalities and convex bodies by recasting them in picturesque language and finding interesting applications for them; and also, incidentally, providing a fertile field for the rediscovery of old results in new form. Decision theory, for its part, has served to give a new and significant direction to statistics. On the sociological side, the introduction of these disciplines has served to extend greatly the quantitative formulation of important economic and sociological problems. It should be emphasized that only the simplest problems are at all amenable to solution, but that the methods available provide a useful and essential insight into more complex and realistic questions.

Mathematicians have, of course, had a field day with the development of these "new" theories, but this is the first book since the fundamental work of von Neumann and Morgenstern to attempt to describe the subject from the point of view of its applications. The authors claim that they have attempted to present the main ideas unencumbered by mathematical details, though they admit the need for mathematical sophistication. Since sophistication plays a far greater role in game theory and decision theory than does manipulative adroitness, this is not as great a concession as it may seem. The authors recognize the difficulty of their task, and in this reviewer's opinion, have gone about as far as they could in the direction of palatability without descending to a trivial treatment.

The book opens with a general discussion on game theory and utility theory, followed by a description of extensive and normal forms of games. This is followed by chapters of two-person games, including zero sum games, nonzero sum noncooperative games, and cooperative games. Next there is a description of "*n*"-person theory. The final chapters deal with individual and group decision making. There are appendices on a prob-