

actions, heavy-ion reactions, photonuclear reactions, nuclear models, weak interactions, polarization, etc. It is impossible to comment on the excellence of the physics presented here—suffice it to say that after the first reading, the reviewer has felt the need to go back to this book literally dozens of times in the last few months. It has become an almost indispensable companion and after a while one no longer minds the few misprints and misplaced figure captions.

New Pathways in Science (Reprint of 1934 Ed.). By Sir Arthur Eddington. 333 pp. Ann Arbor Paperbacks #29. The U. of Michigan Press, Ann Arbor, Mich., 1959. Paperbound \$1.95. *Reviewed by J. C. Polkinghorne, Trinity College, University of Cambridge.*

ALMOST any book published in the last hundred years and attaining some original measure of success is to be found reprinted somewhere in an inexpensive paperbacked edition. No doubt a great service is being performed in making such classical treatises as Rayleigh's *Theory of Sound* available to all for about the price of a meal, but can we say the same about popular scientific expositions? Their purpose is to explain the discoveries of a decade in the idiom of that decade. Is not their proper place thirty years later in the waste paper basket?

Four reasons can be given why this is not so for *New Pathways in Science*. Firstly, Eddington's style is always witty and pleasant to read. Secondly, his philosophical remarks, which with their insistence that the physical world is nothing but a set of symbols giving a structure to our mental percepts and not a "real world out there", are provocative and interesting. Thirdly, it gives a realization of the enormous advances in physical knowledge that have taken place in the past thirty years. The neutron is spoken of as a bound state of electron and proton with the observation that some experimenters rather surprisingly think it is heavier than its constituents. Fourthly, it conveys in its final chapters the flavor of Eddington's reasonings that led him later to write *Fundamental Theory*. In most popular expositions the speciousness and the nonsequiturs which the acute mind detects are due to the effort to express in imprecise everyday language what can only be expressed in precise technical language. However, in this book they accurately reproduce the character of their technical counterpart.

On Understanding Physics (Reprint of 1938 Ed.). By W. H. Watson. 146 pp. Harper & Brothers, New York, 1959. Paperbound \$1.25. *Reviewed by M. W. Friedlander, Washington University.*

UNDERSTANDING of physics rests not only upon the ability to follow the mathematical description of phenomena and the deduction of detailed results, but also upon the assumptions underlying the formalism and the recognition of the regions of validity of these assumptions. This book is con-



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cerned with the understanding of physics on such a basic level.

Since 1938, when this book first appeared, physical knowledge has been extended greatly, and the author himself remarks, in a preface to this edition, that "a different job should be done today". Granted that there are newer topics whose implications would merit discussion—for instance, the nonconservation of parity in weak interactions—those topics covered are still of interest. Throughout, the author is insistent upon clarity in definitions of terms and their subsequent use within these confines, as a necessary step in avoiding apparent inconsistencies. With this in mind at all times, the author embarks on his discussions, which are sprinkled with much good sound common sense, impatient with those whose reasoning is not so well disciplined.

A slim volume, of less than 150 pages, its contents has a high density of penetrating argument. The going is not easy in places, but the effort is well worthwhile. How often is one accosted by philosopher friends (both professional and amateur) and held to account for various alleged implications of physical theories? And how often does one then realize the lack of clarity of one's own understanding? This book can be recommended to all who would extend their comprehension of physics.

Plasma Physics and the Problem of Controlled Thermonuclear Reactions, Volume 3. Edited by M. A. Leontovich. Translated from Russian by J. B. Sykes. Translation editor, J. Turkevich. 422 pp. Pergamon Press, London & New York, 1959. \$24.00 (4-vol. set \$80.00). *Reviewed by Sanborn C. Brown, Massachusetts Institute of Technology.*

THE lack of background on Soviet work in controlled thermonuclear fusion has been a serious handicap to evaluating the contribution of this large and active group in the field. The outline given in their papers presented at the Second International Conference on the Peaceful Uses of Atomic Energy, held in Geneva, September 1958, was very interesting but was difficult to follow up on because their contributions were so brief and sketchily documented. A great step in the direction of correcting that lack is the appearance of Volume 3 of Pergamon Press' four-volume sequence under the single title given above.

All those working in the field will find this collection to be a most useful filling-in of details which have been wanting in the Russian work reported in periodicals available in the United States. We find that many of the problems on which we have been working have been previously worked out in considerable detail by the group at the Academy of Sciences in Moscow, and the reason for the conclusions of many of the Russian papers which have appeared recently and for which we have had no background to evaluate the details now becomes clear. There are three different types of papers given in this volume, all of which are extremely