The book under review contains discussions of many matters. Relativity and other recent theories are discussed. The ideas of Einstein and Maxwell are criticized. The author has little respect for authority, and this alone may entice readers to buy the book. The idea of localized energy is regarded as useless except in the case of radiation and the idea of stress in a medium is regarded as not helpful. The idea of contact action is just as difficult to comprehend as that of action at a distance.

H. BATEMAN

THE PHILOSOPHY OF PHYSICS

On Understanding Physics. By W. H. WATSON. Cambridge University Press, 1938.

THIS book is one more indication that interest in what has been variously termed the philosophy of physics or the logic of physics continues unabated. Sooner or later every physicist succumbs to the temptation to probe more deeply into the foundations of physical theories in the attempt to associate more meaning with what he is doing. The ultimate advantage of this procedure is not that it settles anything but that it does place certain problems in a clearer light. In some measure it also affords physicists an opportunity to clarify their philosophical tastes.

The author of the present volume believes that philosophy has great value in clarifying physical problems, but he also makes clear his opinion that the only kind of philosophy valuable for this purpose is that confined to the study of the logic of language. This sort of philosophizing has recently received much attention through the work of Wittgenstein and also the so-called Vienna circle of logical positivists. The author acknowledges his debt to Wittgenstein for the original stimulus to the present work. The first two chapters of the book are largely devoted to an expression and defense of the view-point that "the function of philosophy . . . is to clear up an understanding of the use of symbolism" and that psychology has little or nothing to do with the logic of physics.

The rest of the volume consists of four not completely integrated essays embodying the application of the author's ideas to various physical theories. There is indeed a common thread running throughout the discussion, namely, the emphasis that in its description of experience physics employs various methods of representation depending on the problem in hand. Unfortunately since the author does not make precisely clear what he means by a "method of representation," the reader will be forced to place his own interpretation on the treatment. The reviewer has the impression that *any* physical theory is an attempted representation of nature. On this view the author appears to be trying to say that whenever we have constructed a physical theory, in every application of the theory we must be careful to preserve consistency with the definitions and postulates of the theory and not try to mix in ideas from another and different theory. It is unlikely that physicists will disagree with this view.

In an interesting chapter on the "Nature of Mechanism" the author makes a few trenchant remarks about causality and points out that the wide-spread belief that quantum theory has abandoned causality is based on a misconception of the physicists' interpretation of this concept. It should perhaps be emphasized that to the author mechanism means simply the determinateness of physical theories, *i.e.*, the fact that theories make *precise predictions* from their postulates. It is not confined to mechanical or dynamical theories as commonly understood.

The last two chapters contain discussions of the concepts of substance and motion and certain aspects of the use of symbolism in mechanics and electricity. Most of the applications here are to classical physics.

The book as a whole is by no means easy reading. The reviewer feels that a closer integration of the various chapters would have enabled the reader better to grasp the gist of the author's admittedly carefully considered opinions and analysis of fundamental questions in the logic of physics.

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MEADOW AND PASTURE INSECTS

Meadow and Pasture Insects. By HERBERT OSBORN. pp. i + viii, 1 + 288, 100 text illustrations. The Educators Press, Columbus, Ohio, 1939.

THE meadow and pasture lands of the country are an important part of the agricultural area of the country. They comprised in the West in 1909 over 80 per cent. of the area and about 60 per cent. of the value of all crops in that part of the country.

This volume presents the first comprehensive account of the part insects play in reducing forage crops, especially grasses. There have been a number of excellent publications upon some of the more injurious species affecting these crops. It has remained for the author to bring together the results of his studies of grass-infesting species extending over a period of more than fifty years. He has been led to conclude that a reduction of nearly 50 per cent. in the forage after land has been in grass three or four years is largely due to insect levies. This is certainly of much practical importance to all owners of grazing land and all owners of live stock, particularly since the author discusses conditions which favor the multiplication of these pests and outlines practical methods for reducing losses of this character.

The ecologist will find much of interest in the volume in the extended discussion of the ecology of the meadow.