

## AN ANTHOLOGY OF WHITEHEAD

Alfred North Whitehead

An Anthology. Selected by Prof. F. S. C. Northrop and Dr. Mason W. Gross. Introductions and a note on Whitehead's Terminology by Mason W. Gross. Pp. 928. (Cambridge: At the University Press, 1953.) 75s. net.

WE are familiar with anthologies—collections of flowers, or beautiful passages—taken from the works of poets. To treat the writings of a philosopher in this way is less usual and has perhaps less evident justification. Of the 928 pages of the volume under review, more than half are taken from Whitehead's popular books, which are very readable and lend themselves to selection. But at the beginning we are faced with his Royal Society memoir, "On Mathematical Concepts of the Material World", one of the most difficult papers ever written. The apology offered for including it is the practical impossibility of obtaining a copy in any other way: the author distributed some offprints when the paper was published forty-eight years ago, but few can now possess one and it has never been reprinted. Later, there are nine chapters taken from "Process and Reality". The wisdom of including them in an anthology is doubtful, for they are by no means easy reading, and are of no interest to anyone but a serious student of Whitehead; a serious student would be sure to possess the whole book.

Whitehead's philosophy in its mature form was published in 1929, in his Gifford Lectures. Since then, it has been the subject of much study and discussion, and there has been time for the formation of some general trends of both approval and criticism. In this view, the beginnings of philosophy should be sought in arranging and contemplating the vast body of knowledge regarding the external world that has been gained by the labours of men of science. A scheme of broad conceptions must be constructed, fusing this knowledge into a rational cosmology; and further progress is then to be made by confronting the system with other types of experience and attempting to extend it so as to unify the whole.

These principles entail the consequence that philosophy, like science, must be a progressive subject. The conceptions of one generation must be replaced by those of the next: no interpretation of the external world, and therefore no explanation of the cosmos as a whole, can endure for ever. The tragedy of Whitehead's system is that it was completed just before the great modern revolution in physics, which was brought about by the discovery of quantum theory, attained such a stage of development that it could be incorporated rationally in a general scheme of Nature. Matrix-mechanics was discovered in 1925, and wave-mechanics in 1926, but they had not spread outside the narrow domain of the higher mathematical physics when the Gifford Lectures were delivered.

The new natural philosophy is based on the doctrine that the dynamical quantity which has been known for more than a century under the name of Action can exist only in multiples of a certain unit, which is called the Quantum of Action. It was found possible by use of this law to explain the puzzling fact that light behaved sometimes like a wave and sometimes as if it were composed of corpuscles; and it led to the prediction, which was verified experimentally, that electricity, which had

previously been known only in the corpuscular form, must have some undulatory properties. These discoveries, however, were difficult to reconcile with the acceptance of the traditional space and time as the framework within which the philosophy of physics must be constructed; and a new foundation seemed to be called for.

In "Process and Reality", time and space are expressions of certain extensive and cogredient properties of events or *actual entities*, which Whitehead takes to be the final real things of which the world is made up. It is, however, extremely difficult to set up any correspondence in detail between the language used by Whitehead and that used in modern theoretical physics: he often refers to quantum theory, but, as we have seen, his philosophy took its final form before quantum theory developed into a rational science. The quantitative treatment of the external world has not yet been presented in a wholly satisfactory philosophic context.

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## TECHNICAL ASPECTS OF AUDIBLE SOUND

Technical Aspects of Sound

Edited by Dr. E. G. Richardson. Vol. 1: Sonic Range and Airborne Sound. Pp. xviii+544. (Amsterdam: Elsevier Publishing Company; London: Cleaver-Hume Press, Ltd., 1953.) 70s.

THE book under review is the first of two volumes on the "Technical Aspects of Sound". Vol. 1 deals with audible sound; Vol. 2 is to cover ultrasound and its applications. The stated aim of the two books is to provide a "handbook" covering "all the technical aspects of the subject . . . at a fairly advanced level" and to be of interest to the "research worker, industrialist and advanced student". Each aspect of the subject has been written by an authority in that field under the editorship of E. G. Richardson, who has also provided a short introduction to the "background of theoretical analysis".

In a handbook covering such a wide field, one looks for a terse, authoritative summary of the essential facts, together with detailed information in graphical or tabular form, and an extensive modern bibliography. Of the sections most in keeping with the scope of the book, mention should be made of the following contributions: L. L. Beranek on the measurement of frequency, pressure and velocity amplitudes, which is a terse, lucid statement; C. W. Kosten on the theory and measurement of acoustic absorption and on the theory of sound transmission (mostly airborne sound), which is easily the most advanced section in the book; the members of the Bell Telephone Laboratories on speech, hearing, speech-transmission rating and microphones, which is a good factual survey of the field presented mainly from the point of view of telephony; and J. and K. de Boer on stereophonic reproduction, which is an effective introduction that could have been extended.

Dr. Richardson's own contribution on musical instruments, the longest section in the book, seeks to assess some of the factors affecting tonal production. His two short chapters on electrophonic instruments and on sound analysis, particularly the section on transient sound analysis, contain few references to the not inconsiderable developments of recent years. The section on room acoustics by H. J. Purkis could