REVIEWS

PHILOSOPHY

SCIENCE AND COMMON SENSE. By W. R. Thompson, F.R.S. (Longmans; 7s. 6d.)

This book is concerned primarily with the mapping of the field of human knowledge of the material world. In this field, mathematics, natural science, and metaphysics all claim rights, and the relation of the three disciplines has for some time stood in urgent need of a clear re-statement; the more so because many scientists without philosophical training have been unable to assess the status of their own conceptions. This is especially true of the biological sciences, in which the problems of the living organism, and the element of finality, introduce extremely important problems which do not greatly trouble the physicist; and indeed this book, considered as providing answers to specific questions of interpretation in science, is most valuable on the biological side. However, in respect of its treatment of the status of natural science and of philosophy, and of the confusions resulting from lack of attention to them, it will be of the greatest interest to all rational people desirous of cutting through the maze of silly comment, on such matters as relativity, quantum theory, evolution and vitalism, which has become one of the stock nuisances of modern intellectual life. Dr. Thompson combines a lucid and self-contained statement of the necessary Aristotelian-Thomist metaphysics (which he equates with "common-sense," considering the latter as a synonym for the natural intelligence working in an impersonal manner) with numerous direct applications to specific cases which have been the subject of scientific investigation, especially in zoology; but no detailed knowledge of any special branch of natural science is assumed.

It is a melancholy fact that most writers on the philosophical setting of natural science have been extremely prone to forget essential distinctions: to muddle categories, neglect the differences of the degrees of abstraction and of the four Aristotelian kinds of cause; and, in consequence, to overlook the facts that, for example, you don't make matter less material by describing it mathematically, nor reduce life to physics by abstracting for special purposes from its organisation. Conversely, it is a marked tendency in current thought to make illegitimate cleavages, and disrupt the web of knowledge into uncoordinated special sciences; to deny, for example, the connection of ethics with industrial chemistry, or welfare studies with economic science; to deny that morals rests upon metaphysics, and even that metaphysics can

apply to the same field of study as natural science. Dr. Thompson's book is directly opposed to these degenerate tendencies. While he insists that science is an autonomous discipline, and refuses to succumb to the worship of the quantitive aspect of the world, dealt with in mathematics, he yet insists also on the necessity of philosophical explanation in the interpretation of scientific results. He welds the several disciplines together in virtue of an admirable exposition of the three degrees of abstraction, and elucidation of their respective applications in specific cases; and by a statement, with examples, of the Aristotelian distinctions of causes.

This being his framework, his criticisms of positivistic accounts of science are naturally severe; and, in place of these rather silly theories, he reiterates the view that the business of science is to render the material world intelligible to us, by reducing an apparent diversity to unity. This does not imply that natural science reveals completely the essences of things, but that the latter are revealed in certain constant sets of properties. The incompleteness of this knowledge does not destroy its positive value. Indeed there seems to be no reasonable account of natural science, if the intelligibility, in some sort, of the material world is denied; all positivism, as Kant saw, reduces our knowledge to a "rhapsody of perceptions." Dr. Thompson likewise refuses to reduce the concept of finality to positivistic terms; by defining it in Thomistic fashion as the pre-ordination of a cause to its effect, and insisting that what a thing can become depends upon what it is, he avoids both the rejection of teleology in organisms, and the exaggerated view which fails to distinguish a non-intelligent organism from the intelligence to which it is merely analogous.

Various important problems are dealt with on these general lines. Dr. Thompson elaborates a view of the status of various theories of vitalism which seems final, and states the legitimate form of the notion with the aid of the important distinction of formal and efficient causes. He discusses evolutionary theory at length, and with some unusual conclusions, which will shock many neo-Darwinians; more especially the rather controversial view that the explanation of structure given by Darwinism is merely verbal, and has the same status as the "virtus dormitiva." This expert discussion is particularly refreshing when one remembers the mediocrity of the older Catholic literature on the subject. Behaviourism is faithfully dealt with and the root cause of its inadequacy indicated. Among numerous important incidental points are the author's timely protest against the worship of mathematics, and his demolition of the bastard-scholastic notion of "natural kinds." Throughout, the treatment is not con-

fined to abstractions but is illustrated by numerous special cases, some of them drawn from the author's special field.

It seems a legitimate criticism of a book with such a title that the physical sciences should be less satisfactorily dealt with. Dr. Thompson's common-sense approach seems to us to have led him to neglect somewhat the epistemological approach, which should be included in any survey of the status of physical science, although less helpful in dealing with the biological sciences. Our knowledge of the material world in physics is much more mysterious than our knowledge of vital organisms, which are at least closely analogous to ourselves; physical entities are not in themselves intuitable, nor can the meaning of interpretatory concepts such as mass and charge be intuited, still less that of the variable ψ in the wave-mechanics. Our knowledge in physical science must, it seems, be regarded as irreducibly a matter of a relation between intelligence and non-intelligent matter, which we cannot "bifurcate" (in Whitehead's phrase), that is, we cannot determine what elements in the complex are due to our minds and what to the external world. This at least can be solved from a study of Kant, even though his subjectivism must be rejected as based upon an illegitimate postulate. Successful though the Aristotelian framework is for the biological sciences, it seems to us that the fruits of modern epistemological enquiries, if stripped of their Cartesian misorientation, must be applied if a reasonable account of physical science is to be given. For this reason, Aristotelian comments on relativity, though true, rather miss the mark; it is not the relativity postulates which are opposed to common sense, but merely the treating of the fourth dimension in a pictorial fashion. But to have dealt adequately with physics would have needed another volume, and we must be grateful to Dr. Thompson for a work which in most respects is altogether admirable.

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LA REPRESENTATION, Essai Philosophique, par André Cresson. (Boivin, Paris; 18 frs.)

Do representations represent? What is the mechanism that forms them? From what have they been developed? To discuss these questions, and as far as possible to answer them, is for M. Cresson to write a Philosophy of Representation. The three questions correspond to the three parts of the essay.

The relevant aspects of various theories of knowledge are outlined, weighed and found wanting, leaving the author to conclude that representations represent realities independent of the knower, realities whose existence is certain however imperfectly we may know their natures. These representations are explained