

ever, and indeed, the progress of medical research makes it likely that the *degenerative* "Anlage" of Birnbaum and the *neuropathic* "taint" of the others is the consequence of definite toxic agents acting either upon the germ cells or upon the developing embryo.

H. C. STEVENS.

University of Chicago.

OUR KNOWLEDGE OF THE EXTERNAL WORLD; AS A FIELD FOR SCIENTIFIC METHOD IN PHILOSOPHY. Bertrand Russell, M.A., F.R.S. London and Chicago: Open Court Publishing Co., 1914. Pp. x, 245.

This book contains the Lowell Lectures delivered by Mr. Russell at Boston in the spring of 1914. In some respects it seems to me to be the most important contribution that has been made to philosophy for a long time past. Much of it is, of course, familiar enough to persons acquainted with the modern work in mathematical logic of which Messrs. Russell and Whitehead's *Principia Mathematica* is the greatest example; but unfortunately the number of such persons outside Cambridge is not large, and it is well that modern views about logic, number, continuity, etc., should have found a popular exponent who is at once an acknowledged master and the possessor of a singularly lucid and pleasant style. But the part that is most strikingly new and original is Mr. Russell's application of modern logical apparatus to the problems of the reality of the external world. He has altered his views on this question in a certain measure since he wrote his "Problems of Philosophy," and he tells us that the suggestion of the new view came from Dr. Whitehead. Anyone who has read Dr. Whitehead's most important paper on "Mathematical Concepts of a Material World" in the *Philosophical Transactions of the Royal Society* will be able to detect the germs of Mr. Russell's present method. This is the part of the book which, whether it ultimately prove tenable or not, seems to me to be the most hopeful step that has been made in philosophy since Leibnitz thought of his Universal Characteristic.

The book opens with two interesting chapters. The first considers current tendencies in philosophy; the second describes in general terms the logic that has been built up by Frege, Peano, and Mr. Russell himself, and shows how it is relevant to philosophy. The two tendencies which Mr. Russell describes and

criticizes are the somewhat moribund idealistic tradition of Kant and Hegel, whose most distinguished exponent is Mr. Bradley, and the modern and very self-conscious schools of Bergson and the Pragmatists. Mr. Russell ascribes philosophical idealism to two sources: (1) the logical intoxication of the Greeks with the success of logical methods in mathematics, and (2) the very restricted and largely erroneous analysis of traditional logic. The former factor accounts for that undue confidence in the validity of abstract reasoning on very complex subjects which allows the idealist willingly to give up such fundamental aspects of the world as qualities and relations merely because they seem to be condemned by certain pieces of reasoning. An acquaintance with empirical science and its history leads us to be less confident of our reasonings, and to ask, when they lead us to such very odd conclusions, whether there may not be something wrong with them or at least with their premises. Needless to say, Mr. Russell does not deny that valid reasoning from true premises may lead us to results that startle common-sense; he only warns us to be much more circumspect than idealists generally have been when this happens. Again many of the most startling results of idealism come from a sheer defect in logical analysis, *viz.*, the view that all propositions ascribe qualities to subjects. In this Mr. Russell finds the logical basis of monism.

I cannot help thinking that this explanation of the belief in monism applies rather more accurately to quite modern idealists like Mr. Bradley than to Hegel or Spinoza. For instance it appears to me that Spinoza justified his monism mainly by erroneous views about the nature of logical and causal implication, while Lotze again justified his by certain prejudices about causation. I must, however, direct the reader's attention to the delightful footnote in which Mr. Russell traces the development of that portentous Hegelian monster, the "concrete universal."

The reaction against this too complete trust in an inadequately analyzed logic has led to Pragmatism and the views of MM. Bergson and Leroy. Mr. Russell has much sympathy with empiricism in so far as it substitutes the patient investigation of detail for pretentious philosophizing about the whole. But he has no sympathy with that condemnation of reason as such and that exaltation of human practical powers which spring from the observed difficulties of philosophy and the marked success of the application of science to daily life. He points out

that a creature like man becomes "trivial and a little absurd" by the pretence of omnipotence; that to conclude inductively that man must progress indefinitely because motors have succeeded coaches and aeroplanes are succeeding motors is a piece of lunacy which no one not blinded by his personal wishes would commit; and that it is no part of philosophy to tell us about such concrete questions as the goodness or badness of the world and the destiny of the human individual. These must be left to the special sciences, and left without very much hope of even a probable answer. All this seems to be profoundly true, and also Mr. Russell's doctrine that we must try to philosophize without any ethical or volitional bias except a whole-hearted desire to understand. It is perhaps important to make clearer than Mr. Russell does that this does not prevent Ethics from being a philosophical science. Good and evil and their relations are sufficiently general to be subjects of philosophical discussion; it is the question what things in particular are good and bad and what proportion the good ones bear to the bad ones in the existent world that must be left to the particular sciences.

Mr. Russell has some excellent criticisms to make on Bergson, both in this introductory chapter and in the last one on causation. He points out that most of the work that Bergson imposes on intuition is done quite thoroughly by sensation and perception; that intuition is only to be trusted in matters that are of importance to the preservation of the species and proceed in a fairly fixed routine; and that even here it is liable to commit the grossest errors if left uncriticized by the intellect. He quotes here with great effect the favorable judgments of lovers concerning each other, which seem to them self-evident and yet are often contrary to the cool reflections of others and of themselves when they have fallen out of love. Finally he argues that, however true it may be that every psychical event is unique in some sense, this does not prevent us from being quite often able to predict the *kind* of mental event that will take place in a given man under given circumstances.

We now come to the general function which modern logic exercises in philosophy. In contrast to the older logic which closed possibilities one by one till the last left was taken as actual, modern logic provides us with two new powers. It enables us to analyze our original problems much more fully and accurately, and it enables us to see all sorts of possible solutions and to test

them by making deductions from them. Such principles as that of Abstraction "enable us to dispense with an almost incredible amount of metaphysical lumber," and to see what are the fewest assumptions by which we can account for the facts. There is room for scientific genius or intuition here; for it will see which out of a number of logically satisfactory explanations is precisely the one whose premises are self-evident. Some problems have been insoluble simply through the lack of sufficient logical apparatus for dealing with them. Mr. Russell quotes the problem of the nature of false judgments which, he thinks, only became soluble when the existence of polyadic relations was recognized.

The rest of the book consists of particular illustrations of the application of these methods to various classical problems. In the lectures on continuity and infinity we are introduced in a remarkably clear and convincing way to the modern logical theory of these subjects. Frege's theory of numbers provides an admirable example of the use of the Principle of Abstraction. Mr. Russell introduces us historically to the question of infinity and continuity by a description of Zeno's paradoxes. He does not claim any infallibility as to his interpretation of what Zeno or Parmenides meant; but, whatever they meant, this plan is a useful one for introducing people to the questions of fact that are involved.

Then the same methods are applied to the question of the external world. Mr. Russell wants to get rid of unperceived and inferred things as the causes of sensations and to replace them by logical constructions involving nothing but actual sense-data. There is obviously a formal analogy between this procedure and Frege's definition of numbers as classes of similar classes instead of unique qualities inferred from the existence of collections. Mr. Russell's argument is that, as all physical theories that contain such notions as atoms or ether and their interactions with each other and our minds must start from sense-data and be verified by them, there must be some logical construction possible which shall give all that is verifiable in any physical theory in terms of sense-data alone. This was suspected by Mach, but lack of logical apparatus prevented him from solving in any detail the problems which such a view sets. And Mach's views are also vitiated in part by the haunting ghost of Berkleian idealism, and partly by the hypothesis of Neutral Monism which is now supported by the American realists. The

latter view is rejected at present by Mr. Russell, though not dogmatically, and in any case it is best not to assume it at the outset, as it adds to the already great logical difficulties of a Phenomenalism such as he is trying to work out. Mr. Russell goes some distance with his reconstruction of physics, but fully recognizes that there is much further to go in the same direction. For instance, he here accepts tentatively as data for this logical construction the sense-data of other people as reported by testimony; but he hopes ultimately to construct a completely solipsistic physics.

It is impossible here to give an account of his construction; suffice it to say that physical things become classes of *sensibilia*; and that much use is made of the important distinction of the appearance of things from a place and at a place, "appearance" being here used in a sense that has no reference to a percipient mind.

There is a final chapter on Causation and Free-will, which is on the lines of Mr. Russell's paper to the Aristotelian Society. His conclusion is that determinism, though a by no means certain doctrine anywhere, is almost as certain in psychology as in physics; that it has no particular bearing on our freedom in any sense in which that is important to us, but only in the sense in which it ministers to a not very admirable form of self-conceit; and that most errors about causation are due to our confusing all causes with volitions.

The whole book is of extreme interest; and it abounds with good sayings. I will not give away to the future reader the reason why our anecdotes about meeting Bismarck are so very different from the grouse stories of our elderly neighbor, and will content myself with quoting for the benefit of teachers of logic the following admirable sentence: "The trivial nonsense embodied in this (the Aristotelian) tradition is still defended by eminent authorities as an excellent 'propædæutic,' *i. e.*, a training in those habits of solemn humbug which are so great a help in later life."

C. D. BROAD.

University of St. Andrews.