EDITOR'S INTRODUCTION

FRANK PLUMPTON RAMSEY was born on 22nd February, 1903, and died on 19th January, 1930. The son of the President of Magdalene, he spent nearly all his life in Cambridge, where he was successively Scholar of Trinity, Fellow of King's, and Lecturer in Mathematics in the University. His death at the height of his powers deprives Cambridge of one of its intellectual glories and contemporary philosophy of one of its profoundest thinkers.

Though mathematical teaching was Ramsey's profession, philosophy was his vocation. Reared on the logic of Principia Mathematica, he was early to see the importance of Dr. Wittgenstein's work (in the translation of which he assisted); and his own published papers were largely based on this. But the previously unprinted essays and notes collected in this volume show him moving towards a kind of pragmatism, and the general treatise on logic upon which at various times he had been engaged was to have treated truth and knowledge as purely natural phenomena to be explained psychologically without recourse to distinctively logical relations. Ramsey's philosophy, however, was always tentative and experimental—his calmness in infanticide frequently amazed his friends—and the papers in this volume are published as important in themselves and as likely to lead to work on similar lines and not as the exposition of a consistent and complete philosophical system.

The subtlety and fertility of Ramsey's philosophical work as shown here need no advertisement; but since his two papers on mathematical economics are not included, I have
obtained Mr. J. M. Keynes' permission to quote from his notice in *The Economic Journal* of March, 1930:—

"The death at the age of 26 of Frank Ramsey is a heavy loss—though his primary interests were in Philosophy and Mathematical Logic—to the pure theory of Economics. From a very early age, about 16 I think, his precocious mind was intensely interested in economic problems. Economists living in Cambridge have been accustomed from his undergraduate days to try their theories on the keen edge of his critical and logical faculties. If he had followed the easier path of mere inclination, I am not sure that he would not have exchanged the tormenting exercises of the foundations of thought and of psychology, where the mind tries to catch its own tail, for the delightful paths of our own most agreeable branch of the moral sciences, in which theory and fact, intuitive imagination and practical judgment, are blended in a manner comfortable to the human intellect.

"When he did descend from his accustomed stony heights, he still lived without effort in a rarer atmosphere than most economists care to breathe, and handled the technical apparatus of our science with the easy grace of one accustomed to something far more difficult. But he has left behind him in print (apart from his philosophical papers) only two witnesses to his powers—his papers published in *The Economic Journal* on 'A Contribution to the Theory of Taxation' in March, 1927, and on 'A Mathematical Theory of Saving' in December, 1928. The latter of these is, I think, one of the most remarkable contributions to mathematical economics ever made, both in respect of the intrinsic importance and difficulty of its subject, the power and élançé of the technical methods employed, and the clear purity of illumination with which the writer's mind is felt by the reader to play about its subject. The article is terribly difficult
reading for an economist, but it is not difficult to appreciate how scientific and aesthetic qualities are combined in it together.

"The loss of Ramsey is, therefore, to his friends, for whom his personal qualities joined most harmoniously with his intellectual powers, one which it will take them long to forget. His bulky Johnsonian frame, his spontaneous gurgling laugh, the simplicity of his feelings and reactions, half-alarming sometimes and occasionally almost cruel in their directness and literalness, his honesty of mind and heart, his modesty, and the amazing, easy efficiency of the intellectual machine which ground away behind his wide temples and broad, smiling face, have been taken from us at the height of their excellence and before their harvest of work and life could be gathered in."

The essays collected in this volume range in date from 1923 to 1929, and present the development of Ramsey's thought from the age of 20 to his death. The papers on mathematical logic are placed first. I, on the Foundations of Mathematics, is an attempt to reconstruct the system of Principia Mathematica so that its blemishes may be avoided but its excellencies retained. By what he calls an "objective" theory of predicative functions, Ramsey shows how the notorious contradictions (I am lying, etc.) can be removed by the use of a Theory of Types which is simpler than that proposed by Mr. Bertrand Russell and which makes it unnecessary to assume an Axiom of Reducibility in order to save irrational numbers. Moreover a "complete extensionalizing" of mathematics solves the difficulties connected with identity and with the Multiplicative Axiom. Ramsey's paper is thus in the great tradition of Frege, Peano, Whitehead and Russell; and in a sense may be said to complete their work on the logical foundations of mathematics.
In II—a semi-popular paper read before the British Association in 1926—this "logical" treatment of mathematics is defended against the formalism of Hilbert and the intuitionism of Brouwer. The end of this paper shows that Ramsey was not completely satisfied with his theory, particularly with regard to the Axiom of Infinity; and in 1929 he was converted to a finitist view which rejects the existence of any actual infinite aggregate and to which allusions are made in some of the later notes. Ramsey's profound disagreement with Hilbert's doctrine of mathematics as a game with meaningless marks did not prevent him from giving a good deal of attention to the formalists' chief problem—that of finding a general procedure for determining the consistency of a logical formula (the Entscheidungsproblem)—and III is his solution of the problem for a particularly interesting set of cases.

A relatively smaller proportion of Ramsey's purely philosophical work has been previously published. IV consists of an article denying that there is any ultimate distinction between particulars and universals, and VI—"Facts and Propositions"—is a logical analysis of belief. Ramsey's review of Wittgenstein's book is printed as an Appendix. This review was Ramsey's first important philosophical paper and it contains things of the greatest interest: but it was written before Ramsey had discussed the book with its author, and he admitted that on many points he had misunderstood it; so the paper must be taken neither as exposition nor as criticism of the views of the Tractatus Logico-Philosophicus itself.

The previously unpublished papers that are printed here all deal with philosophical topics. VII is a long essay on Truth and Probability written at the end of 1926, a large portion of which was read to the Moral Science Club at Cambridge. It elaborates a thoroughly subjective theory of probability and a thoroughly pragmatic view of induction.
At one time Ramsey contemplated publishing this essay separately, and it is in a much more finished state than are the other unpublished papers. Its final chapter—on probability in science—was never written. I have supplemented the essay by some notes on relevant topics written in the spring of 1928 (VIII). The last section of the book (IX) is made up of a series of papers written in the summer of 1929. The first of these is a very serious attempt to provide a theory of theories and of their use in reasoning. There follow an exceedingly subtle theory of the nature of causal propositions, further remarks on probability and knowledge, and a note on the essence of philosophy. These essays, fragmentary and tentative though they be, seem to me to display Ramsey's mind in its highest power.

The short paper printed as Epilogue was read to a Cambridge discussion society in 1925: Ramsey did not change the attitude towards life that he has so happily and characteristically expressed in it.

It is of interest to state which of Ramsey's important papers have been omitted from this volume. These are (1) the two articles on economics, (2) most of a symposium contribution which was mainly occupied in criticizing the previous symposiumist (but I have reprinted the rest as V), (3) the notes for his annual course of lectures at Cambridge on the Foundations of Mathematics, (4) some notes on general propositions, causality, and knowledge written in the spring of 1928 and superseded by those on the same subjects of the summer of 1929 (allusion is made in these to his earlier causal theory), (5) fragments of 1929 on the occasion of his conversion to mathematical finitism, further attempts on the Entscheidungsproblem and fragments about theories, and (6) the draft of the first four chapters of a general treatise on logic. This work had occupied Ramsey intermittently during 1927 and 1928, but he was profoundly dissatisfied
with it, and the preliminary matter which remains is quite unsuited for publication.

I am deeply grateful to Mrs. Lettice Ramsey for the privilege of editing this book as well as for assistance at every stage of its production. Mr. Alister Watson also has helped most ably in the proof-reading. Messrs. G. H. Hardy, J. M. Keynes, G. E. Moore, M. H. A. Newman, and L. Wittgenstein (with others of Ramsey's friends) have given me valued advice as to the selection of the papers, though I alone am responsible for the final choice. The authorities of the London Mathematical Society, the Mathematical Association, the Mind Association, and the Aristotelian Society have kindly given permission for the previously published papers to be reprinted. In these, and in the papers published for the first time, I have occasionally made slight verbal and symbolic alterations to assist the reader. But I have not attempted to modify to any extent the informality of many of the notes. Nor (beyond adding a note on the symbolism and a few references) have I attempted to alleviate the difficulties of the subject. This book is presented in the hope that it will stimulate others to think about the hardest things in the world with some of that singleness of mind which characterized Frank Ramsey.

R. B. Braithwaite.

Cambridge.

June and December, 1930.