

*Theory of probability*, Volume I, Bruno de Finetti, John Wiley & Sons, New York, 1974, xix + 300 pp., \$22.50.

*Theory of probability*, Volume II, Bruno de Finetti, John Wiley & Sons, New York, 1975, xviii + 375 pp., \$29.50.

In a foreword to this pair of volumes, Lindley says "I believe that it is . . . destined ultimately to be recognized as one of the great books of the world". I think this is more likely to apply to the original version in Italian, for the English translation is much less lucid than most of the chapters in de Finetti's *Probability, induction and statistics*, which is a collection of articles. In this review I shall refer to Volumes I and II as (I) and (II) and to this other book as (0).

de Finetti is one of the pioneers in the development of subjective probability, and of the Bayesian or, more accurately, the neo-Bayesian school of statistics. At first, his writings appeared in Italian and French, beginning in the 30's, and especially in 1937, and were not at first influential in English-speaking countries until he was "discovered" by L. J. Savage who edited one of de Finetti's articles for publication in 1951.

The language barrier acted in both directions, for de Finetti arrived at his basic position without knowing of the somewhat similar work by F. P. Ramsey which was published in England in 1931.<sup>1</sup> Both de Finetti and Ramsey argued convincingly that a system of precise subjective (personal) probability judgments must satisfy the familiar axioms, and that rational actions should maximize expected utility. de Finetti's position is, however, more "radical" (to use his own epithet), for he claims that "Probability does not exist" (I, p. x). By this he means that it does not exist in an objective sense, in other words he denies the existence of physical probability. Although I agree that physical probability cannot be measured without using subjective probability, I feel that to deny its existence is too extreme. It could have been consistently maintained that the probabilities underlying classical statistical mechanics are necessarily subjective, and arise because of our ignorance of the precise initial conditions, but the probabilities of quantum mechanics might well be an irreducible feature of the interaction between a physical system and a piece of physical apparatus. Even in classical mechanics, the notion that the initial conditions could "exist" to an accuracy of millions of decimal places seems far-fetched; yet Laplace's demi-urge would have urgently required such accuracy because a detailed prediction to a time  $t$  into the future, of specified accuracy, would require a number of decimal places proportional to  $t!$

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<sup>1</sup> de Finetti had an important direct influence on Savage; whereas my main sources were Ramsey, Keynes and Harold Jeffreys. My 1950 book was reviewed by both Savage and Lindley, the latter when he was still a frequentist, so the Cambridge school might have had an early indirect influence on both these prominent Bayesians. It was Savage's book of 1954 that completed Lindley's conversion to the Bayesian camp. The entire network of influences is of course very complex and may depend more on oral than on written communication.