Key terms in logic

R. Carnap (1950/1962) "Foundations of Logical Probability", University of Chicago Press, Chicago, 2nd edition, 613 pages.

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General
This book presents Carnap's views on confirmation, induction and the concepts of logical and frequentist probability. Its central tenets are that all inductive inference is probabilistic, that the required concept of probability derives from logical relations between evidence and hypotheses, and that inductive inferences are therefore analytic. The book laid the groundwork for quantitative inductive logic in the second half of the 20th century; see reading.

Contents
The book starts with a description of the problem, and of Carnap's philosophical methodology of concept explication. Two distinct notions of probability are introduced, logical probability pertaining to confirmation, and factual probability pertaining to long-run relative frequency. Subsequently the language systems of deductive logic are introduced to furnish inductive logical systems, and a general characterisation of the problem of inductive logic is given. This leads to the development of regular c-functions, which express the confirmation of hypotheses by evidence as a partial entailment, in analogy to deductive entailment. Then the measure r is introduced, expressing the relevance relations between evidence and hypotheses. The functions c and r are shown to capture a pre-theoretical notion of comparative and qualitative confirmation. The book then deals with the class of symmetric c-functions, which are invariant under permutations of terms in the language. Finally, c-functions are shown to perform the same function as estimators in classical statistics. An appendix introduces to the confirmation function c^*, which forms the basis for much of the later work in inductive logic.

Literature
- R. Carnap (1952) "The Continuum of Inductive Methods", University of Chicago Press
- P.A. Schilpp (1963), "The Philosophy of Rudolf Carnap", Open Court
- Carnap, R. and Stegmüller, W. (1959), "Induktive Logik und Warscheinlichkeit", Springer
- R. Carnap and R. C. Jeffrey (1980), "Studies in Inductive Logic and Probability", Vols. 1 and 2, University of California Press

Reading guide
Following this work, Carnap wrote a treatise on quantitative inductive systems, "The Continuum of Inductive Methods" (1952), University of Chicago Press, Chicago. An important criticism against Carnap's programme was mounted in N. Goodman (1955), "Fact, Fiction, and Forecast", Harvard University Press, Cambridge (MA). Carnap's broader programme is discussed in P.A. Schilpp (1963), "The Philosophy of Rudolf Carnap", Open Court. An overview of results in inductive logic after 1950 is given in Carnap, R. and Stegmüller, W. (1959), "Induktive Logik und Warscheinlichkeit", Springer, Wien, and further in R. Carnap and R. C. Jeffrey (1980), "Studies in Inductive Logic and Probability", Vols. 1 and 2, University of California Press, Berkeley.