

The Probabilistic Revolution

Volume 1: Ideas in History

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A Bradford Book
The MIT Press
Cambridge, Massachusetts
London, England

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Careful attention to the testimony of contemporary witnesses and the etymological career of the word “revolution” itself provide criteria for judging whether a scientific revolution has occurred. By these criteria, a revolution occurred not in probability itself but rather in its applications in the period 1800–1930.	
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Probabilism is taken to denote the view that statistical laws may be fundamental in scientific explanation. Several philosophical problems impeded its recognition, among them the fusion of the dominant epistemological tradition with deterministic mechanical theory, the confused conceptions of causation, and the obstinate difficulties involved in understanding the nature of statistical regularities.	

- 5 The Decline of the Laplacian Theory of Probability: A Study of Stumpf, von Kries, and Meinong** 91
 Andreas Kamlah
 The breakdown of Laplace's theory of probability at the end of the nineteenth century is studied. We find a genuine scientific revolution in Kuhn's sense, a partly irrational gestalt switch.
- 6 Fechner's Indeterminism: From Freedom to Laws of Chance** 117
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 Fechner's universal indeterminism of 1849 originated in the opposition of late idealism to the rigor of Hegelian logic. The posthumously edited mathematical formulation of his ideas served as the model for von Mises's frequency theory.
- 7 The Saint Petersburg Paradox 1713–1937** 157
 Gérard Jorland
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- 8 Laplace and Thereafter: The Status of Probability Calculus in the Nineteenth Century** 191
 Ivo Schneider
 Laplace's form of probability theory dominated the subject until the 1880s. The key figure who blocked the impact of Laplace's possible successors, like Poisson, was Cauchy. Cauchy's attacks on the subject reduced research to error theory.
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 Eberhard Knobloch
 Borel's publications on probability theory were mainly influenced by Poincaré, Bertrand, Reichenbach, and Keynes. But his realistic conception of mathematics led him to oppose their views. He believed that the applications were more important than the axiomatization of the theory. Rejection of the continuum, determinism, and unpredictability were crucial problems for him.
- III UNCERTAINTY**
- 10 The Domestication of Risk: Mathematical Probability and Insurance 1650–1830** 237
 Lorraine J. Daston
 Mathematical probability and statistics were not applied to insurance until the end of the eighteenth century when the

emergence of new values that opposed the salaried class' fear of sudden poverty to the gambler's hope of sudden riches overcame resistance to quantifying uncertainty.

- 11 The Objectification of Observation: Measurement and Statistical Methods in the Nineteenth Century** 261
 Zeno G. Swijtink
 In the nineteenth century, the rise of formal, nondeductive methods of reasoning like the method of least squares presupposed, and reinforced, an objectification of scientific procedure; personal judgment in observation disappeared through the use of measuring instruments, which led to "observation without an observing subject."
- 12 The Measurement of Uncertainty in Nineteenth-Century Social Science** 287
 Stephen M. Stigler
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- IV SOCIETY**
- 13 Rational Individuals versus Laws of Society: From Probability to Statistics** 295
 Lorraine J. Daston
 Both the eighteenth-century moral sciences and the nineteenth-century social sciences viewed the mathematical theory of probability as "social mathematics," but the meaning of "probability" and the relationship between probability and statistics had to be redefined in order for it to serve both the psychological moral sciences and the sociological social sciences.
- 14 Décrire, Compter, Calculer: The Debate over Statistics during the Napoleonic Period** 305
 Marie-Noëlle Bourguet
 Napoleonic statisticians shifted from descriptive ethnography to quantitative methods only when social science became a search for causes rather than a classification of types.
- 15 Probability in Vital and Social Statistics: Quetelet, Farr, and the Bertillons** 317
 Bernard-Pierre Lécuyer
 Quetelet's ideas about probabilities in the social sciences are

presented, and their impact on three statistical practitioners (William Farr in England, and Dr. Louis-Adolphe Bertillon and his son Jacques in France) are examined.

- 16 Paupers and Numbers: The Statistical Argument for Social Reform in Britain during the Period of Industrialization** 337
 Karl H. Metz
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- 17 Lawless Society: Social Science and the Reinterpretation of Statistics in Germany, 1850–1880** 351
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 M. Norton Wise
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