BOOKS: HISTORY OF SCIENCE

Statistics in the Social World

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The Politics of Large Numbers
A History of Statistical Reasoning
Alain Desrosières translated by Camille Naish
Harvard University Press, Cambridge, MA, 1998. 380 pp. $45. ISBN 0-674-68932-1.

Statistics is a field rooted in 350 years of intellectual history that began in the 17th century with Pascal and Huygens's development of elementary probability for games of chance and Graunt's creation of rudimentary data analysis methods to study the English bills of mortality. The Gauss-Laplace synthesis of the early 19th century brought together the methods of least squares and the use of mathematical probability to assess uncertainty. Although this synthesis led many physical scientists to accept statistical theory, most of another century passed before statistics began to emerge as a separate identifiable field of intellectual inquiry. Only with the development of random sampling, randomized experiments, and other new methods and perspectives—by such 20th-century giants as Karl Pearson, R. A. Fisher, and Jerzy Neyman—did statistics help to transform the social sciences, biology, and medicine.

The Politics of Large Numbers assays nuggets gathered from this intellectual landscape. Alain Desrosières weaves a narrative that sweeps back and forth, across countries and centuries, while attempting to explain how the development of modern statistics is intellectually intertwined with the knowledge and power of governments. Offering a different focus from previous histories of statistics, for example, those by Porter and Stigler (*1*), Desrosières develops the interplay between the evolution of statistical methods and ideas and their functioning within the state. He gives special prominence to the role of national and international statistical agencies, especially in the European context—an emphasis that is not surprising, given his position at the Institut National de la Statistique et des Études Économiques, France's government statistical agency. But Desrosières also touches on many of the important debates on the foundation of statistics and he has an eloquent, although brief, overview of governmental statistical history in the United States.

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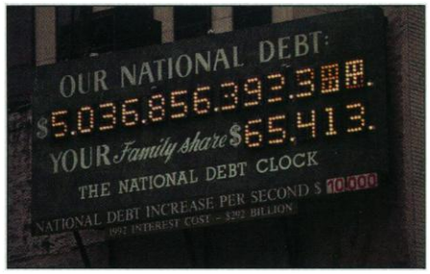
An ongoing debate within the history and philosophy of science contrasts externalist with internalist perspectives. Desrosières claims to transcend the separation of these competing views by integrating social contextual materials (externalist) with intellectual ideas (internalist), and in some senses he succeeds. But his account remains largely externalist, and he inevitably gives short shrift to interesting intellectual issues and interesting disciplinary questions. Moreover, his focus on the 20th-century rise of applied econometrics, largely in Europe, ignores many of the important American developments, including the rise of the mathematical statistics establishment.

When this book arrived, I was in the process of pursuing two historical questions, and I turned to it eagerly for insights. The first issue is: When and why did the use of Bayes' Theorem as a basis for inference become known as "Bayesian"? Desrosières uses the modern term Bayesian to describe the method of inverse probability as he traces the development of the method from its 18th-century origins, in the posthumously published paper of Thomas Bayes and the work of Pierre Simon Laplace, to the 20th-century formulations by subjectivists such as Keynes, Ramsey, de Finetti, and Savage. In fact, although the seminal work of Jeffreys in the 1940s and Savage in the 1950s still referred to the method as inverse probability, by 1960 the term Bayesian inference had become standard usage in the statistical literature. What triggered the sudden change? The book offered me no help in answering my question, despite its introductory claim that the "conclusion briefly invokes the development of and subsequent crisis in statistical language since the 1950s."



Political accounting.

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My second question concerns an argument advanced last year in the litigation attempting to stop the use of sampling in the U.S. census. In a brief submitted to the court, lawyers argued that the framers of the Constitution had considered the use of statistical estimation and sampling for census-taking and rejected them in favor of an "actual enumeration." Should we credit such a claim? Given the rudimentary state of statistical theory at the end of the 18th century, one might be tempted simply to dismiss the claim as ludicrous. Nonetheless, the origins of the now important method of ratio estimation first advanced by Laplace in the mid-1780s clearly require closer examination. (Laplace generalized from a sample to the population using the ratio of population to births during the preceding year.) Desrosières's brief, but interesting, account of Laplace's work in chapter 1 situates it in the context of other 18th-century attempts to use the ratio idea. Later in chapter 7, however, the author notes that Laplace's work had little or no practical influence until the 20th century and the rise of probability sampling. Thus, like most modern scholars, Desrosières would appear to provide no evidence to support the claimed explanation of the constitutional language.

Desrosières's book is erudite and provides an interesting synthesis of a broad expanse of intellectual history. But it tends to delve into many topics somewhat superficially, and thus the knowledgeable reader gains few new insights into the evolution of statistical ideas. Each chapter reads much as if it were written as a separate essay, virtually unconnected with the others. In fact, I recognized much of the language of chapter 7; I had enjoyed reading it in an almost identical form as part of a 1991 edited collection on the history of the social survey. Curiously, the current book refers only to the original 1988 French version of that essay, although the 1991 collection does appear in the reference list.

The book's title, *The Politics of Large Numbers*, is a pun on the "law of large numbers" from the theory of probability and stresses the author's theme that modern statistics "derives from the recombining of scientific and administrative practices that were initially far apart." Desrosières successfully pursues this synthesis of perspective throughout the book. It is an important addition to the recent attempts to survey the history of statistics and a useful complement to my favorite sources, Porter and Stigler, and the important, but almost exhaustively-detailed, internalist accounts by Hald (*2*).

References

1. T. M. Porter, *The Rise of Statistical Thinking* (Princeton Univ. Press, Princeton, NJ, 1986); S. M. Stigler, *The History of Statistics: The Measurement of Uncertainty Before 1900* (Harvard Univ. Press, Cambridge, MA, 1986).
2. A. Hald, *A History of Probability and Statistics and Their Applications Before 1750* (Wiley, New York, 1990); *A History of Mathematical Statistics From 1750 to 1930* (Wiley, New York, 1998).