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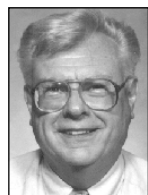
Rethinking Randomness

by Andrew Ruppel, Feature Editor

Events over the past year have sensitized us to the occurrence of totally unexpected events, particularly those with global reverberations. How many of us how have re-examined or even revised our concept of randomness as a result of these dramatic events? Those loyal to statistics and science probably have not, continuing to view randomization as a core, referential construct in thinking objectively about causality. Those banking on a less-than-perfect randomization to provide surprises, that is, opportunities for speculation—monetary, literary, or otherwise—probably now feel uncomfortably correct in their view. Like all things, there are different perspectives on randomness, rarity, and surprise. Here are some of them as reflected in recent releases.

events seldom are courteous enough to allow themselves be well understood. Clearly, one must distinguish the process from a particular outcome. As we have come to realize, it is the unexpected, uncomfortable, undesirable outcome that generates doubts about the fairness of process.

Now, as to the book itself—it is a clearly and cleanly presented compendium of statistical tools of particular value to graduate students and budding researchers. It provides helpful ideas to instructors striving to develop ways to present statistical methodology effectively to non-statistical majors needing to apply those methods within their own scientific fields. No calculus or matrix algebra is employed in the discussions of methods (mainly of variants of the generalized linear model), which will dissatisfy the professional statistician. Each of the book's 24 chapters leads off with one or more case studies from observational as well as experimental investigations. These are drawn from the social and physical sciences. Many of the case studies and data sets are of keen interest to subject area specialists but will not likely be readily known to most readers. This is actually a plus because the reader can concentrate on the appropriateness of the analysis and conclusions from a statistical point of view, and not be distracted by the science particulars. Three classes of end-of-chapter exercises are provided: conceptual, computational, and those demanding fuller treatment, as in a statistical report. Data is provided on an accompanying CD.



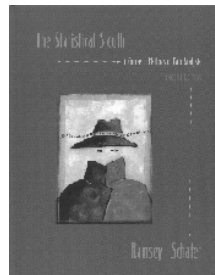
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American Society for Engineering Education and the American Assembly of Collegiate Schools of Business, and has served with NASA and the International Atomic Energy Agency (with diplomatic rank). He teaches in the areas of statistics and global business.

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The Statistical Sleuth (2nd ed.)

By Ramsey & Schafer

Duxbury, 2002,
742 pages.
www.duxbury.com

THE POSITION IN STATISTICS, as typified in this useful work by two Oregon State professors, is that randomization is essential to sound statistical detective work. Samples should be drawn randomly if one wishes to extend the results beyond just the set of collected data. Assignment to treatment groups should be randomly done to control for factors that cannot be explicitly set out in an experimental design. Though randomization is an "equal-employment-opportunity" mechanism, the authors note that: "Flipping [a coin] is always fair before the coin hits the table, but the outcome is always unfair to the loser." Since statistical analysis is built on distributions, the randomization scheme employed has to be well understood. But real-world random

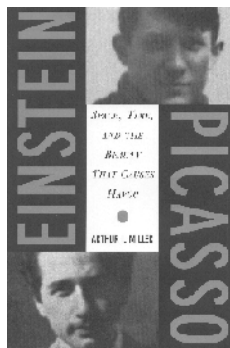
Einstein and Picasso

By Arthur I. Miller

Basic Books, 2001, 237 pages
www.basicbooks.com

EINSTEIN WAS PRETTY CLEAR ON RANDOMNESS. The quotation: "God does not play dice with the universe," is frequently cited. (A more exact translation from Einstein's original

German words would be: “I am convinced that *He* does not play dice.”) He wrote this to his physics colleague Max Born as part of his critique of quantum mechanics—an approach to physical theory relying on probability distributions. Despite developing the seemingly stochastic notion of relativity, Einstein was pretty much a determinist. This posture was foretold in his famous early paper explaining Brownian motion—the

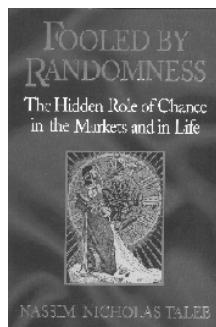


seemingly random jiggling in particles that we see in views through a microscope. He showed in the paper that the cause of the motion was determined by the collisions of atoms and molecules. This 1905 paper was an important

piece of evidence in building the case for the existence of atoms, at the time a controversial idea in physics.

Author A. I. Miller is a professor of the history and philosophy of science. His book examines the parallelisms in the lives (particularly the early lives) and discoveries of two of the protean figures of the twentieth century: Albert Einstein and Pablo Picasso.

Both were grappling with issues of representing time and space. Both were immersed in the intense cultural ferment of their time. Both were influenced by the non-Euclidean geometry of Henri Poincare. And there were parallels in their personal lives as well. Not many know that Einstein fathered a child out of wedlock, whereas many are aware of Picasso's affairs. The parallelisms between Einstein's and Picasso's lives and creative efforts may not be perfect, like a ladder with some missing and some broken rungs, yet with enough whole rungs to keep the ladder together. Miller's account is a fascinating one and is supported by considerable documentation laid out in 54 pages of notes, 18 pages of bibliography, and more than 70 illustrations. For those interested in the processes of intellectual thought and creativity, this is a recommended read.



Fooled by Randomness
By N. N. Taleb

Texere, 2001,
204 pages.
www.etexere.com

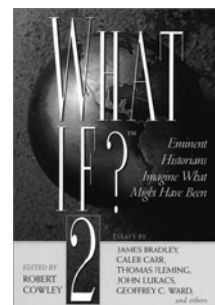
HERE WE ARE CHALLENGED BY THE AUTHOR to distinguish rare events from plain-vanilla randomness. The author is

a financial trader and speculator, who focuses on profiting from crisis situations. While randomness lurks about more than we think or like, Taleb says we are not good at recognizing it. Indeed, he says that we are genetically predisposed to be “probability blind.” And we often seek out and report patterns where none actually exist. Taleb admits that he suffers from these shortcomings. In his view, most traders (and others) who have had astonishing financial success owe their pecuniary gains to *pure* (note the qualifier here) chance—rare events that proved especially lucky for them. This is the well-known “Being in the right place at the right time.” Knowing where the ‘right place’ is located is a real challenge when it's moving about. As Taleb observes, sustained success in speculation comes about by not being “path dependent” in making choices.

Statisticians have problems handling rare events, says Taleb, because there are asymmetries possible in the way data about a process can come about. For example, continually drawing white balls from an urn reveals nothing about the non-white balls that may be present, particularly if the urn's contents are being changed without our knowing that. In other words, the randomness that Taleb worries about is not that emerging from the statistician's well-understood procedures and carefully specified distributions, it is the singular randomness of the rare event (typically the convergence of several rare events, what we might call *crises*), such as those that confronted Long-Term Capital Management or happened at the World Trade Center.

This book itself has a considerable element of randomness about it, as the author tends to wander, like an idea-bee, from one intellectually fragrant flower to another. Some readers will find that irritating. If your knowledge of Greek and

Roman history and philosophy (which Taleb frequently cites) is good, then his flitting about may not bother you. Unfortunately, he provides only one page of meager notes for the whole book to support his intellectual “travels.”



What If? 2
Robert Cowley, ed.

Penguin-Putnam,
2001, 416 pages.
www.penguinputnam.com

FROM RANDOM EVENTS TO RARE EVENTS TO “reversed events,” is what this book offers. Key historical

developments are re-examined and what-if alterations posed and then fleshed out for the reader's consideration. This work is a successor to editor Cowley's first compilation in 2000 of essays (by others) speculating upon alternative, but plausible outcomes to historical events, and it was reviewed in the Dec.-Jan. 2000 issue of *Decision Line*.

The alternative histories in this latest release are more provocative than those in the first volume. While some speculations about hypothetical alterations may have the quality of “for want of a nail, a shoe was lost, for want of a...,” the ones in the book are at a higher level. Consider: What if Socrates had died in battle and so did not live to provide Plato with the model for intellectual discussion? Supposing Martin Luther had been burned at the stake (the common punishment of heretics at the time)? What if the Chinese of the Ming Dynasty had turned outward instead of inward and explored the Atlantic Ocean ahead of the Portuguese? What if Jesus was not crucified and instead was pardoned and allowed to live to an old age? “What would...” indeed! It is striking how much potential change lays in historical events, modifications of which can seem reasonable and likely to the time, but only in retrospect do they become rare and extraordinary events. The 100-year flood only becomes that after 100 years have passed. The once-in-a-1,000-years' leader takes a millenium to discover. Care to wait?