



Critical Mass: How One Thing Leads to Another

By Philip Ball

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Are there "natural laws" that govern the ways in which humans behave and organize themselves, just as there are physical laws that govern the motions of atoms and planets? Unlikely as it may seem, such laws now seem to be emerging from attempts to bring the tools and concepts of physics into the social sciences. These new discoveries are part of an old tradition. In the seventeenth century the philosopher Thomas Hobbes, dismayed by the impending civil war in England, decided that he would work out what kind of government was needed for a stable society. His solution sparked a new way of thinking about human behavior in looking for the "scientific" rules of society.

Adam Smith, Immanuel Kant, Auguste Comte, and John Stuart Mill pursued this idea from different political perspectives. But these philosophers lacked the tools that modern physics can now bring to bear on the matter. Philip Ball shows how, by using these tools, we can understand many aspects of mass human behavior. Once we recognize that we do not make most of our decisions in isolation but are affected by what others decide, we can start to discern a surprising and perhaps even disturbing predictability in our laws, institutions, and customs.

Lively and compelling, *Critical Mass* is the first book to bring these new ideas together and to show how they fit within the broader historical context of a rational search for better ways to live.



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Editorial Review

From Publishers Weekly

Ball (an NBCC award finalist for *Bright Earth*) enthusiastically demonstrates how the application of the laws of modern physics to the social sciences can greatly enrich our understanding of the laws of human behavior: we can, he says, make predictions about society without negating the individual's free will. He opens his lucid and compelling study with an account of Thomas Hobbes's mechanistic political philosophy and shows how Adam Smith, Kant, Auguste Comte and John Stuart Mill expanded on Hobbes's scientific but anti-utopian theories of government and society. Ball notes a return to such a scientific view of the social sciences in the past two decades, and he examines the application of physical laws to economics, politics, even the inevitable synchronization of a theater audience's applause. First, he exhaustively details the development of key concepts in contemporary physics, such as self-organization, phase transitions, flocking behavior, chaos, bifurcation points, preferential attachment networks and evolutionary game theory. Next, he shows how social scientists apply these concepts to the study of human organization. Ball's primary assertion is that we must attend to the relationship between global phenomena and local actions. In other words, noticing the impact of individual decisions on laws and institutions is more worthwhile than trying to predict the behavior of individuals (as Ball's discussion of the logic of voting habits makes all too clear). Ball's carefully argued disagreements with conventional economic theory make for particularly engaging reading. Nonspecialist readers who enjoy a steep learning curve will relish the thought-provoking discussions Ball provides. Photos, illus.

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From Booklist

In this wide-ranging investigation of pioneering attempts to explain social behavior by applying formulas borrowed from physics, Ball explains how maverick social theorists are now using discoveries about molecular motion and crystal formation to predict the behavior of various human groups, including crowds of soccer fans and clusters of pedestrians. Ball acknowledges that past "political arithmeticians" have often dehumanized their subjects by adopting mechanistic assumptions about individual psychology and have sometimes legitimated totalitarian rulers by giving them a putatively scientific charter. But Ball's numerous detailed examples of the new social physics show how statistical models from physics can yield highly reliable predictions for large-group outcomes without abridging the unpredictable freedom of individual choice. These same examples teach that a consistent physics of society yields not an ideological straitjacket stipulating how people *should* act but rather a detailed portrait of how people *do* act. Because the new social physics can help managers and policy makers in dozens of fields, this accessibly written book will attract a very diverse audience. *Bryce Christensen*

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Review

"A wide-ranging and dazzlingly informed book about the science of interactions. I can promise you'll be amazed." *Bill Bryson, chair of the 2005 Aventis General Prize Judging Panel*

"Philip Ball makes physics sexy again in *Critical Mass*." *Elissa Schappel, Vanity Fair*

"It's lively and wonderfully informative." *George Scialabba, The Boston Globe*

"Fascinating. . . impressively clear and breathtaking in scope. . . substantial, impeccably researched . . .

persuasive. For anyone who would like to learn about the intellectual ferment at the surprising junction of physics and social science, *Critical Mass* is the place to start.” ?Stephen Strogatz, *Nature*

Users Review

From reader reviews:

Mary Ybarra:

The particular book Critical Mass: How One Thing Leads to Another has a lot details on it. So when you check out this book you can get a lot of profit. The book was compiled by the very famous author. Mcdougal makes some research before write this book. That book very easy to read you can find the point easily after reading this book.

Nona Whitehouse:

Critical Mass: How One Thing Leads to Another can be one of your beginning books that are good idea. Most of us recommend that straight away because this e-book has good vocabulary that can increase your knowledge in terminology, easy to understand, bit entertaining but nevertheless delivering the information. The author giving his/her effort to get every word into satisfaction arrangement in writing Critical Mass: How One Thing Leads to Another although doesn't forget the main level, giving the reader the hottest and also based confirm resource facts that maybe you can be one of it. This great information can drawn you into brand new stage of crucial considering.

Michael Decker:

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Glenn Wallin:

In this era globalization it is important to someone to obtain information. The information will make professionals understand the condition of the world. The condition of the world makes the information much easier to share. You can find a lot of recommendations to get information example: internet, newspaper, book, and soon. You will observe that now, a lot of publisher this print many kinds of book. The book that recommended for you is Critical Mass: How One Thing Leads to Another this guide consist a lot of the information in the condition of this world now. This particular book was represented just how can the world has grown up. The language styles that writer value to explain it is easy to understand. Typically the writer made some analysis when he makes this book. Here is why this book suitable all of you.

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