PREFACE

It may come as a surprise to many readers that our democratic institutions and the instruments to implement the will of the people are by no means foolproof. In fact, they may have strange consequences. One example is the so-called Condorcet Paradox. Named after the eighteenth-century French nobleman Jean-Marie Marquis de Condorcet, it refers to the surprising fact that majority voting, dear to us since times immemorial, can lead to seemingly paradoxical behavior. I do not want to let the cat out of the bag just yet by giving away what this paradox is. Suffice it to say for now that this conundrum has kept mathematicians, statisticians, political scientists, and economists busy for two centuries—to no avail. Worse, toward the middle of the twentieth century, the Nobel Prize winner Kenneth Arrow proved mathematically that paradoxes are unavoidable and that *every* voting mechanism, except one, has inconsistencies. As if that were not enough, a few years later, Allan Gibbard and Mark Satterthwaite showed that every voting mechanism, except one, can be manipulated. Unfortunately, the only method of government that avoids paradoxes, inconsistencies, and manipulations is a dictatorship.

There is more bad news. The allocation of seats to a parliament, say to the U.S. Congress, poses further enigmas. Since delegations must consist of whole persons, they must be integer numbers. How many representatives should be sent to Congress, for example, if a state is due 33.6 seats? Should it be thirty-three or thirty-four congresspeople? Simple rounding will usually not work because in the end, the total number may not add exactly to the required 435 congressmen. Alternative suggestions have been made, in the United States as well as in other countries, but they are fraught with problems, some methods favoring small states others favoring big states. And that is not the worst of it. Under certain circumstances, some states may actually *lose* seats if the size of the House is *increased*. (This bizarre situation has become notorious under the designation Alabama Paradox.) Other absurdities are known as the Population Paradox and the New State Paradox. Politicians, scientists, and the courts have been battling with the problems for centuries. But similarly to Arrow's Theorem, it finally turned out that no solution to the problem exists. The mathematicians Peyton Young and Michel Balinski proved that there are no *good* or *correct* methods to allocate seats to Congress or any other parliament.

This book is an elucidation and a historical account of the problems and dangers that are inherent in the most cherished instruments of democracies. The narrative starts two and a half millennia ago, with ancient the Ancient Greek and Roman thinkers Plato and Pliny the Younger, continues to the churchmen of the Middle Ages Ramon Llull and Nicolaus Kues, goes on to heroes and victims of the French Revolution Jean-Charles de Borda and the Marquis de Condorcet, and from there turns to the Founding Fathers and ends with modern-day scholars like Arrow, Gibbard, Satterthwaite, Young, and Balinski

I have written this book for a general readership, my aim being to introduce readers to the subject matter in an entertaining way. Hence it is by no means a textbook but may serve as accompanying literature for a more rigorous course in political science, economics, administration, philosophy, or decision theory. Much weight has been given to the personalities who have been involved during the past two and a half millennia in the endeavor to understand the problems and in the attempts to correct them. In order not to disturb the flow of the text, however, material about the *dramatis personae* and their times is often consigned to an additional reading section at the end of the chapters.

While expounding on the blithe aspects of the subject matter, I do not at all make light of its importance and of the serious difficulties. But even though the issues are very deep, the arguments never involve anything but the most basic mathematics. In fact, readers need not have more knowledge of mathematics than what they learned in junior high school. It is inherent in the problems that the mathematics never moves beyond simple arithmetic. But let the reader not be deceived by this apparent simplicity; the questions are surprisingly deep and the arguments amazingly sophisticated.

Many people have been very generous with help and guidance. Unfortunately, I cannot list them all here for a simple, if unpleasant, reason: my e-mail archive got corrupted and I have been unable to reestablish the correspondence with people whose advice I sought while writing this

book. I sincerely apologize. Those whose e-mails I could find are: Kenneth Arrow, Michel Balinski, Daniel Barbiero, Anthony Bonner, Robert Inman, Eli Passow, Friedrich Pukelsheim, Christoph Riedweg, and Peyton Young. I would also like to thank Vickie Kearn, Anna Pierrehumbert, and Heath Renfroe from Princeton University Press and freelancer Dawn Hall for diligent editing; three referees for painstaking reviews; and, as always, my agent Ed Knappman who also came up with the book's catchy subtitle.

While revising the manuscript, I spent a one-month "sabbatical" at the Rockefeller Foundation's Bellagio Study and Conference Center. Bellagio is a beautiful village on the shore of Lake Como in Italy that was once the property of none other than the hero of chapter 2, Pliny the Younger. He described it as such: "Set high on a cliff . . . it enjoys a broad view of the lake which is divided in two by the ridge on which it stands. . . . From the spacious terrace, the descent to the lake is gentle. . . ." You may gather from this that Pliny was in love with the place, and so were my wife and I. I am very grateful to the Rockefeller Foundation for having afforded us the occasion to walk in the footsteps of Pliny the Younger . . . and to put the finishing touches to this book.

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