shows just how difficult it would be to exorcise intentional notions from microeconomics.

If economics has not shown predictive progress—and is incapable of doing so because of the grip of intentionality—how are we to explain the particular theoretical choices made by the economics profession? Why do we have the particular economics we do? According to Rosenberg economics is best understood as the result of two (mutually reinforcing) influences. First, economics is a branch of "contractarian political philosophy" (Ch. 7) and second, it is a branch of "applied mathematics" (Ch. 8). Economics (general equilibrium theory in particular) serves political philosophy by providing formal support for the claim that "the unintended consequences of uncoordinated selfishness results in the most efficient exploitation of scarce resources in the satisfaction of wants" (p. 219). This political goal is enhanced by—"perfectly complementary" (p. 221) with—the view of economics "as a branch of mathematics somewhere on the intersection between pure and applied axiomatic systems" (p. 247). Thus in his last two chapters Rosenberg concludes that "economics is not empirical science at all" (p. 236). Economics is interesting political philosophy and it is good mathematics, but despite "its appearances and the interest of some economists in applying their formalism to practical matters, this formalism does not really have the aims, nor does it make the claims, of an unequivocally empirical theory" (p. 236).

No doubt most economists will take Rosenberg's arguments in this book to be a challenge, rather than an epitaph for scientific economics. His empirical claim regarding the predictive success of economics, as well as his dismissal of other methodological approaches, will undoubtedly be questioned. So too will his arguments that economics is best understood as contractarian political philosophy and applied mathematics. The part of Rosenberg's book that will be least challenged by economists is his important discussion of intentionality in Chapters 5 and 6. The question of the scientific status of folk psychology and intentional explanations has long been an issue in the philosophy of mind and the philosophy of psychology. Rosenberg is one of the few people who has recognized the importance of these issues for the question of the cognitive status of economic theory. He has already made the point in earlier works (1981, 1988), but it is very important that it be made in a work that is wholly dedicated to economics. Rosenberg not only makes the point in this book, he makes it forcefully and articulately. The question of intentionality and its relationship to economics is a very important and yet long neglected issue in the philosophy of economics; this book by Alexander Rosenberg (finally) gives the question the attention it deserves.

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C Mathematical and Quantitative Methods

Games, strategies, and managers. By John McMillan. Oxford; New York; Toronto and Melbourne: Oxford University Press, 1992. Pp. x, 252. $22.95. ISBN 0–19–507403–3.
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Can the logic of game theory be presented as effectively in words as by mathematical models? I always believed that to do serious justice to game theory, one must have matrix boxes with the payoffs and players clearly marked. My view has been that a verbal or descriptive account of the theory would necessarily reduce it to platitudes and simple proverbial statements. Such proverbs by their nature are insightful; however there is a proverb that supports every side of an issue. Case studies and simple examples do not a theory make—or so I thought!

Professor McMillan has proven me wrong. *Games, Strategies, and Managers* presents most of the concepts of today's game theory and information economics. The book should

find a receptive audience among students of managerial economics and decision theory with an interest in policy and applications. The book covers the concepts of a (Nash) equilibrium, repeated games, information economics (the lemons problem), optimal contracts, and auctions.

The author does a very good job of presenting these ideas and showing how they may be used to explain the "logic of the situation" in social interactions. He uses next to no formal mathematics in the exposition—forget calculus! All the basic ideas are illustrated with very simple numbers and computations that you could perform on the back of an envelope or on a paper napkin in a coffee shop. Despite the simplicity of the computations, the analysis is compelling. The basic ideas are conveyed in a very sharp and clear manner.

The author's style is leisurely and, in parts, "journalistic." I enjoyed this the most. The book has a healthy sprinkling of humorous quotes to focus attention on the topic about to be studied. The book also has a fair amount of little tidbits of information about real-life cases—"infotainment." I found myself laughing aloud at the accounts of how NBC outsmarted CBS in bidding for the T.V. rights to the Seoul Olympics, and how the USSR (those "capitalists?") outsmarted all the U.S. networks in the bidding for the Moscow Olympics. There was also the story of the $300 peeled oranges air-freighted to the business executive who . . . I could go on and on. There is a lot in the book to keep one entertained (and informed!).

My only complaint is the absence of a preface that tells the reader how all the sections fit together. The book is indeed well organized, but I sometimes lost the big picture—I was paying attention to the details. After completion and reflection the pieces of the whole did come together. I would have preferred a map of the entire course of the book much earlier on.

Such a map would have indicated that the book is divided into a number of parts. Part I discusses the basic notion of a (Nash) equilibrium and maximization in general (with some great quotes on "greed"). The prisoners' dilemma problem is introduced with examples. Then comes a nice but simple account of how repeating the game may lead to cooperation. Risk aversion is also introduced here. Part II, entitled "Negotiating," discusses bargaining and the importance of focal points, outside options, and "burning bridges." Asymmetric information is introduced into the analysis in this section, and the lemons problem, signaling and screening models are studied. These concepts are then applied to the study of the negotiation of international agreements, in the process of which a lot of interesting factual details are presented.

Part III is the section on "Contracting." Here various contractual arrangements (e.g., piece rates and fixed wages) are discussed and compared. This section also shows how contracts may be designed to reveal the true type of agents in asymmetric information models. This is clearly illustrated with simple "back of the envelope" computations. Part IV is the section on "Bidding." In this section common and private value auctions are discussed with some study of the optimal bidding under various situations. The winner's curse is also discussed. All these concepts are used in analyzing the very humorous history of bidding for T.V. rights for the Olympic games.

The book has two additional sections that are particularly useful. There is a readers' guide which provides further references and a list of survey articles on the topics covered in the book. A final section provides some case-study type questions for students to test their understanding and to apply the material presented in the book.

To conclude, I liked this book a great deal. Its main audience, I believe, will be students in MA, MBA or even undergraduate level managerial economics or game theory classes. Those of us who teach more theoretical game theory classes may appreciate the "institutional details" provided in the book and use them to liven up the mathematics. Etymologists will enjoy some of the details provided (do you know the roots of the word "strategy" or "incentive"?). Quotation buffs also will not be disappointed. Indeed, there seems to be something for everyone. I am glad that the need to review this book forced me to sit down and read it. I thoroughly enjoyed the experience.

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