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While the field of turbulence is too fluid—in the other sense of the word—for these articles to represent for very long what we understand of the field, they do provide an excellent picture, painted by many major artists, of where we are now. The reader who wishes to see this picture in all its richness and complexity could do no better than to begin with this volume.

STANLEY A. BERGER
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Prisoner's Dilemma: John von Neumann, Game Theory, and the Puzzle of the Bomb

William Poundstone
Doubleday, New York, 1992.
290 pp. \$22.50 hc
ISBN 0-385-41567-2

This is a very strange book. The potpourri suggested by the subtitle, *John von Neumann, Game Theory and the Puzzle of the Bomb*, is unfortunate. The author, a seasoned writer, approaches the prisoner's dilemma, but wanders into the life of von Neumann, discusses game theory and describes the activity of Oskar Morgenstern in his collaboration in 1944 with von Neumann on *Theory Games and Economic Behavior* (Princeton U.P., Princeton, N.J., 1944), which Poundstone describes as "one of the most influential and least-read books of the 20th century." Poundstone gives a brief discussion of the role of Emile Borel to game theory. More evidence of the author's skill at popular writing is that he also works in the story of the fission bomb, and in due course, that of the hydrogen bomb.

The prisoner's dilemma has its origins in game theory. There are two versions of the game: a one-shot version and another involving many plays; both are based on the basic assumption of rationality of play. According to Albert Tucker, the scenario for the prisoner's dilemma is as follows: Two men, both charged with a joint violation of the law, are held separately by the police. Each is told that if one confesses and the other does not, the former will receive a lighter sentence while the latter will receive the maximum penalty. If both confess, they will both receive lighter sentences, but if neither confesses, both go free. The rules force the prisoners, who are unable to communicate and develop a strategy,

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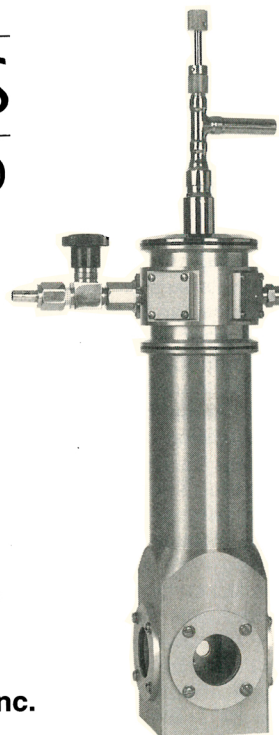
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into conflict. The game has been used to analyze military—particularly nuclear—strategy.

But this book is really about von Neumann, a very distinguished mathematician recognized for his versatility, equally brilliant in pure and applied mathematics. Any one of his many contributions in either category would have earned him a place in history. When this single factor is multiplied by the number of his serious efforts, the product is genius. A mere glance at the six volumes of his collected works (edited by A. H. Taub) is sufficient to convince one of this. By calling the book *Prisoner's Dilemma*, the author has provided a scaffolding for von Neumann's biography and for his history. Because the biography and the history are rather terse, their blemishes matter little.

One anecdote missing from the book concerns von Neumann's great care in preparing his publications. When his famous book on quantum mechanics was to be translated from German to English, the translator, Robert T. Beyer, realized that the author was paying attention to the details—so much so that having the author available was not such an advantage.

The book is also a history of the Rand Corporation, one of the first post-World War II think tanks. Von Neumann worked there as a consultant beginning in 1948. While at Rand he advocated preventive war, and he remained enthusiastic about it until his death in early 1957. In describing Rand Corporation, Poundstone points out that during the time von Neumann worked there the principal economists in the US were on its staff and that almost all were there at the same time. However, in wartime Los Alamos, where von Neumann also was a consultant, the concentration of physicists was so spectacular that a member of the British Mission (which participated effectively in the atom bomb project) was moved to make the pronouncement that not since classical times had there been such a concentration of talent.

It is clear that the conception of the book is adequate. There are 13 chapters, with an average of six subsections in each; there is an index. The book is written very well. Actually, the book has the structure of a mosaic: some operations research, some game theory (encoded in the prisoner's dilemma and the dollar auction), cold-war applications and more. In these hectic days the book may be useful for filling in some of the gaps in one's knowledge. It is not, however, a good treatment of its protagonist,

John von Neumann, nor of Klari, his wife.

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BOOK NOTE

Chernobyl: Insight from the Inside

V. M. Chernousenko

Springer-Verlag, New York,
1991. 367 pp. \$34.00 hc
ISBN 0-387-53698-1

The author, a physicist who was head of the laboratory for nonlinear physics and ecology at the Institute for Theoretical Physics in Kiev from 1973 to 1991, served as scientific director of the Ukrainian Academy of Sciences task force on Chernobyl, as deputy chairman of the academy's commission on "rectification" of the consequences of the accident and as one of three authors of a secret report to the Soviet government on the accident. Partly because of Chernousenko's authoritative background, the book is worth comparing closely to the previous important works on the accident by Grigori Medvedev and Zhores Medvedev (see PHYSICS TODAY, June 1991, page 105).

Even though the author's presentation of material is rather unsystematic, the data he has gathered, the transcriptions of his interviews and the photographs are very vivid. More than any other single source, perhaps, the book conveys the human tragedy of the accident.

The author is highly critical of both the Soviet government and the International Atomic Energy Agency, the latter, he argues, for uncritically accepting the Soviet government's version of events and for whitewashing the biological consequences of the accident in a special study it did two years ago. Even the widely praised emergency operations immediately after the accident come under sharp scrutiny. A participant in the rectification program is quoted as saying that the Soviet government put restart of the undamaged reactors ahead of minimizing the human toll from the accident: "They took this political decision to deny that here we had a disaster of global proportions—to show that the state could cope with it and, in doing so, demonstrate the stability of the existing political system."

The book was published in English before appearing in Russia or Ukraine, and the translation is not

always what it might be. Also, the author's observations are not always as novel or provocative as he appears to believe—his conclusion, for example, that defective features of the reactor design were primarily responsible for the accident is universally shared among informed people outside the states of the former Soviet Union. Still, the book as a whole is compelling and informative.

—WILLIAM SWEET

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