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Bruce J. WEST, ed. *Mathematical Models as a Tool for the Social Sciences*. New York: Gordon and Breach, 1980. 120 pages. \$26.50.

The editor's own introduction provides an apt characterization of the eight essays in this volume, which is the outgrowth of a joint physics-mathematics seminar at the University of Rochester, of which the editor was a co-organizer. West notes that "the intent of the seminar was to apply techniques of mathematical modeling, which have proven themselves of such value in the physical sciences, to problems in the social sciences," and he cautions that "the level of mathematical complexity varies markedly from lecture to lecture." Moreover, "the lectures . . . are not intended to have the finished appearance of journal publications, but more the exploratory feelings of a report where methodology rather than solutions of particular problems are of central importance." Not surprisingly, the only essays which are easily accessible to the social science reader are those by social scientists: a historian, Robert W. Fogel; a psychologist, A. O. Dick; and a political scientist, William H. Riker.

Fogel's essay, "Historiography and Retrospective Econometrics," is particularly striking in revealing the implicit modeling assumptions in certain classic "literary" works in economic history whose models are couched in words and not symbols. Fogel shows these implicit models often reflected unrealistic simplifications of economic linkages which led their authors to serious erroneous conclusions, e.g., as to the unprofitability of antebellum slave-holding in the South. Fogel also indicates how challenges to the realism of the assumptions in some of his own models have led him to a direct test of those assumptions. For readers unfamiliar with the recent debate on the "new economic history," this essay offers an excellent introduction.

Dick's essay, "A Mathematical Model of Serial Memory," deals with a topic which has occupied psychologists since the 1880s, the short-term and long-term memory for brief lists of independent items as a function of stimulus position and other aspects of experimental design. What makes Dick's essay of interest to the nonpsychologist is the way in which he presents the reader with the equivalent of a detective story—tracing out the history of various false but often insightful hypotheses which have been built upon/discarded/rediscovered over the years in a fashion that sometimes approaches the abruptness of a Kuhnian paradigm shift and other times looks more like the cumulative process of building "normal" science. Dick's own model is an inventive one which is based on ideas of association formation and stimulus interference.

Riker's essay, "A Mathematical Theory of Political Coalitions," presents what is, by now, his well-known minimum winning coalition model which uses an axiomatic approach to deduce the consequence that in zero sum game n -person games (with certain other assumptions satisfied) the only stable coalitions that can form are those which contain no inessential members. Riker asserts that while "society in general corresponds to a non-zero sum game, . . . there are some clear-cut examples of nearly zero sum games, e.g., elections, total wars, etc." In such situations, Riker's model would predict that "rational men attempt to form coalitions that are no longer than are required to win"—at least if we confine ourselves to short-run optimizing behavior.

I shall briefly summarize the remaining five essays in all of which the ratio of mathematical symbols to wordage is quite high: J. Keilson and B. J. West, "A Simple Algorithm for Contact Acceptance," deals with an optimizing problem of interest to economists and of general applicability to optimal sequential choice from a sampling distribution with specific parameters. A. Budgor and B. J. West, "Natural Forces and Extreme Events," uses the Gumbel distribution to fit maximum and minimum river heights for the Nile River Valley over a span of 1300 years. J. H. B. Kemperman, "Systems of Mating," looks at the implications of mating rules in terms of possible genotypic equilibria. B. J. West, "The Psychology of Speculation: A Simple Model," is an inaccurate description of the contents of this essay for those (like this reviewer) unfamiliar with the Fokker-Planck equation and not fluent in the use of Fourier transforms. W. W. Badger, "An Entropy-Utility Model for the Size Distribution of Income," compares the fit of the Pareto distribution, the log-normal distribution, and the author's own "entropy-utility" model for 1935-36 U.S. income data, with the latter model coming out preferred. Most of the paper is devoted to a derivation of an entropy-utility model and will be incomprehensible to any reader who lacks a quite advanced statistics background.

In sum, this collection is appropriate for purchase by research libraries and by specialists in mathematical modeling, but except for the three essays first mentioned, its contents are far too diverse and too mathematically demanding to be of much interest to most social scientists. One final point: it is apparent that the appearance of the essays was long delayed, since most appear to have been written in the late 1960s or early 1970s. The most recent reference citation in any chapter is 1974, and Fogel's essay is reprinted from a 1970 journal publication.

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