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## GAMES OF LIFE #1762

Sigmund, Karl. 1993. **Games of life: explorations in ecology, evolution, and behaviour.** Oxford University Press, New York. vi + 244 p. $49.95 (cloth), ISBN: 0-19-854665-3; $17.95 (paper), ISBN: 0-19-854783-8.

There are a number of writers, including Richard Dawkins, Steven Vogel, and Stephen Gould, whose writing style makes their work worth reading just for the prose. Karl Sigmund is another name to add to the list. Sigmund's *Games of Life* is loosely centered on a fairly eclectic range of biological games, with an intended audience of "potential or actual students and the interested layperson." The book covers inherently mathematical themes but offers only the logic behind the models and their predictions, without any of the math, hence the accessibility to interested laypersons. Sigmund's lucid style and use of historical anecdotes make this book eminently readable. The book doesn't break any new ground, but it is a wonderful introduction to the logic of some of the models that have been developed in evolutionary ecology.

There are nine chapters, covering self-replicating automata and what they tell us about the evolution of life (with an extensive discussion of Conway's computer game, Life), population dynamics (including Lotka-Volterra models, chaos, simple 3-trophic level systems, and island biogeography), population genetics (random drift, Mendelian genetics, the evolution of dominance, and segregation distorters), the evolution of sex (runaway selection, the good genes hypothesis, why sex, why a 1:1 sex ratio, and why primarily two sexes?), and game theory (alternative mating tactics, the hawk-dove game, a chapter devoted entirely to cooperation and the Prisoner's Dilemma). As this list indicates, Sigmund covers a great deal of ground.

Frankly, I liked this book much better the second time I read it. Based on the title, I had originally expected it to be a book on game theory, which it is not. There is some discussion of game theory, but only after the sixth chapter. The first chapter on computer games is not particularly relevant to the study of evolutionary ecology (although I suspect it will appeal to Life aficionados), and the chapter on population dynamics is not particularly compelling. However, the rest of the book more than makes up for these shortcomings. The genetics section is quite good, including a clear discussion of chance, mutation, and genetic drift (topics that are typically difficult for students to grasp). Similarly, there is a fairly up-to-date discussion of the Prisoner's Dilemma, iterated games, and the evolution of cooperation. Except for a few minor quibbles (such as the under-emphasis of the role of exponential growth in some of the statistical paradoxes raised in the genetics section), the explanations are surprisingly clear and the writing style is refreshing.

This book is designed to be a brief introduction to these topics. As such, there isn't nearly enough depth in any one topic for the book to be useful in a graduate course (nor was it designed for this purpose). However, it would be ideal for an advanced undergraduate seminar in behavioral ecology or evolution; many of the ideas are sufficiently complicated that it would take a fair amount of discussion to work through them.

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