

## THE COMPLEXITY OF SIMPLICITY

**Simplicity and Complexity in Games of the Intellect.** Lawrence B. Slobodkin. Harvard University Press, Cambridge, MA, 1992. 266 pp., illus. \$24.95 (ISBN 0-674-80825-8).

For 20 years, Lawrence Slobodkin studied hydra, among the simplest of metazoan animals. His goal was to predict parts of hydra's ecology and future evolution from a few environmental measurements, using a simple mathematical model. He wanted to show that simple theories could be useful, even in a science as complex as ecology. After a while, he began to wonder what he and other scientists meant by simplicity, and why it is so highly prized. He found available no general theory of simplicity and complexity. To see what light diverse fields could shed on his understanding of simplicity, he set out on an intellectual odyssey through art, religion, and science. *Simplicity and Complexity in Games of the Intellect* is his informal, highly personal account, "neither properly erudite nor turgidly philosophical," of that "fascinating, but bewildering, voyage."

His theme is that "simplicity, its associated concepts, and their role deserve more attention for at least two reasons. First, as a possible danger, lest they contribute to illusion and—worse—to delusion. Second, as an inescapable part of intellectual work of all kinds, and of attempts to deal with difficult practical problems" (p. 12). Such a simple summary does little justice to the many digressions, personal anecdotes, and exotic examples that give this ambitious narrative its rich texture.

Slobodkin refines the antinomy between simplicity and complexity into four oppositions: simple and complex, simplified and complicated, simplistic and obfuscated, minimal and ornate. He argues from the evolutionary history of human awareness that "a sense of self is a prerequisite to the human intellectual capacity to deliberately simplify or complicate" (p. 39). He reviews the differing roles of theological and legal simplicity in Judaism, Christianity, Islam, and other religions. He infers that "shutting out

all but a small subset of properties of the environment...is necessary for all intellectual exercise" (p. 65) and that play, an essential ingredient in art, science, and religion, simplifies reality to attain some control over it.

The core of the book describes how ideas of simplicity and complexity are used in the play of art and science. Slobodkin's personal, humorous style is illustrated by his introduction to the chapter called "Three dinner parties" (p. 81):

By considering the act of dining we can introduce, in a simple and accessible form, examples of essentially all that can be done in the way of simplifying or complicating. It is an especially appealing art for two reasons. First, while it certainly can be performed by highly trained masters, it is simple enough to invite amateur participation. Also, I enjoy reading about food. It provides a vicarious experience capable of much greater variety than that provided by verbal descriptions of sex. If you do not like to read about food, skip this chapter, but note that there is no chapter about sex.

Alas!

Slobodkin then turns to art, another field "where the central issue is basically a matter of taste." A section entitled "What is art?" displays no lack of hubris; it arrives, by a route that defies brief summary, at Slobodkin's answer to the question, formulated in a "terrifyingly bold and simple statement" that I will not give away here. Slobodkin then describes "the processes of simplification and minimalization in several sciences... [as] an ongoing skirmishing war on the edge of scientific knowledge, in which overwhelming complexity and confusion are just held at bay" (p. 138). In the notes at the back of the book, Slobodkin offers several provocative assessments of recent developments on the edge of scientific knowledge.

Near the end of the voyage, Slobodkin concedes, "By focusing on examples rather than definitions I have permitted words to float like plankton in a vernacular sea. This had the advantage of allowing us to see 'simplicity' and 'complexity' in their natural habitat, unrestricted in their be-

havior and free to attach themselves in any way that they would" (p. 200). After discussing possible definitions and giving credit to mathematicians and computer scientists for usually having a clear meaning when they use the word *complexity*, Slobodkin gently turns over to the reader the problem of understanding simplicity: "Unfortunately, as in all the other chapters, this chapter can only point to a great mass of material, like a tour of the Louvre in twenty minutes" (p. 220).

Where does Slobodkin come out on simplicity? First, "all serious attempts to solve discrete problems must involve simplifications" (p. 224). I think this statement means that it is not a sin to make simplified mathematical models in trying to understand something that appears to be complex. But, Slobodkin says, simplification can be dangerous if it creates obstacles to further inquiry or serves selfish goals. Hence, simplification requires judgment: "confusion between the simplistic and the simple is a serious public threat" (p. 229). Consequently, Slobodkin concludes, we need to understand simplicity and simplification better.

Roughly 30 years ago, Slobodkin's classic *Growth and Regulation of Animal Populations* (1961) was the most intellectual text in my first undergraduate course in ecology and evolution; *Growth and Regulation* presented population biology as an exciting arena for the confrontation between ideas and experience, between theory and data, between the simplicity of models and the complexity of field observations. But *Simplicity and Complexity* is not a summation of Slobodkin's insights into population biology and ecology. In fact, ecology is only a bit player here. One of ecology's lines: "Ecology may be the most intractable legitimate sci-

ence that has ever developed" (p. 138). According to the preface, Slobodkin hopes to make ecology a leading lady in a future book. I look forward to it.

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