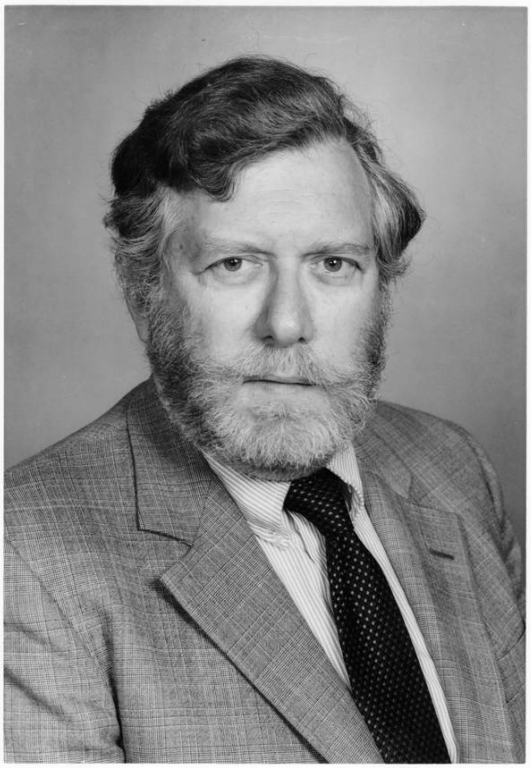
# Resolution of Respect

## Lawrence B. Slobodkin

1928–2009



Lawrence B. Slobodkin, a key figure in the development of the modern science of ecology, passed away on 12 September 2009, at age 81. His innovative thinking and research, provocative teaching, and visionary leadership helped transform ecology into a modern science, with deep links to evolution.

A child of the Bronx, New York City, Slobodkin was strongly influenced by the artistic, intellectual, cultural, and political milieu in which he developed; his mother was a writer and his father a noted sculptor who later became a well-known illustrator and writer of children's books, including biographies of the legendary revolutionaries Garibaldi and Lenin. While absorbing the lessons of art and literature, Slobodkin developed a guiding interest in biology, which he pursued first at Bethany College in West Virginia, and later under G. E. Hutchinson at Yale, where he received his doctorate in 1951 at the age of 23. Hutchinson, one of the most renowned ecologists of the 20th century, sought broad theoretical principles for ecology, and with his students helped to build a modern theoretical and mathematical framework on foundations that Volterra and Gause had already laid. Slobodkin played an important role in developing this framework via his research, teaching, and his very influential book, *Growth and Regulation of Animal Populations* (Slobodkin 1961), which served as a blueprint for generations of students of ecology at all levels. His doctoral research, a detailed study of the role of age structure in the growth of experimental populations of the microcrustacean *Daphnia*, epitomized his approach—a quantitative experimental test of a mathematical theory that was intended to apply broadly.

After completing his Ph.D., Slobodkin worked for two years for the United States Fish and Wildlife Service, where he developed a novel, theoretically informed hypothesis for the origin of red tides. In an autobiographical sketch in 2009, he wrote: "My Fish and Wildlife Service supervisors were furious at my claiming to have solved the 'Mystery of the Red Tide'…. So long as there was 'Mystery' they could defend the size of their appropriation. The only way I could get my two red tide papers published was to quit the civil service and take my manuscripts with me" (Slobodkin 2009).

In 1953, shortly after leaving the Wildlife Service, Larry joined the faculty of the University of Michigan in the Department of Zoology, where he pioneered the use of calorimetry as a tool for studying the "efficiency" of energy flow in ecosystems, a field in which his groundbreaking experimental work left a permanent legacy (despite his self-effacing remark that he had "derived a widely unused concept I called 'population efficiency'" [Slobodkin 2009]). He initiated a research program on brown and green hydra that explored such problems as the joint role of food and predation on limiting population growth, and the continuum of species interactions that lie between mutualism and parasitism.

Slobodkin's research accomplishments were broad. He was an innovative thinker whose ideas provided the foundations for many topics that are still studied today. Together with Nelson G. Hairston, Sr. and Frederick Smith, his senior colleagues at the University of Michigan, he wrote one of the most influential papers in the history of ecology, a four-page essay in *The American Naturalist* (Hairston, Smith, and Slobodkin 1960) that is still required reading for many students in this field. Submitted under the title "Étude" (unacceptable to the editors), HSS (as the paper is often referred to) offered a simple but closely reasoned hypothesis for the regulation of populations at each trophic level in terrestrial ecosystems. The "world is green," they reasoned, despite the insatiable appetite and enormous diversity of herbivores, because herbivore populations are held in check by their own natural enemies—predators, parasitoids, parasites, and pathogens. (Larry later offered this 17-word summary: "The herbivores are usually expected to be well fed and carnivores are usually expected to be hungry" [Slobodkin 2009].) This hypothesis was both controversial and inspiring, and stimulated much later research on tri-trophic interactions, food web dynamics, and trophic cascades.

By the time he moved to the State University of New York at Stony Brook (now Stony Brook University) in 1968, Slobodkin was one of the most distinguished ecologists in the world. The department he established there—the Department of Ecology and Evolution—was one of the first of its kind, and soon became recognized as a preeminent department in its field under his leadership. While at Stony Brook, Larry served as department chair for five years and directed its graduate program for seven years, in addition to serving as co-editor of *The American Naturalist* and writing two more books, *Simplicity and Complexity in Games of the Intellect* (Slobodkin 1992) and *A Citizen's Guide to Ecology* (Slobodkin 2003). Many of the Ph.D. students he mentored, first at the University of Michigan and later at Stony Brook, went on to become well-known ecologists, environmental scientists, and evolutionary biologists. His approach to the doctoral projects of his graduate students allowed them the intellectual freedom and self-determination that he himself had enjoyed when he studied with Hutchinson at Yale. (Slobodkin and Slack 1999). Slobodkin (2009) wrote that "My teacher, Evelyn Hutchinson, had tacked to his wall a magazine page of mottoes. I found the most important one to be, 'Never try to discourage a student, for you will [almost] certainly succeed'" (*almost* is included in this quotation, earlier, by Slobodkin and Slack 1999 and independently by Birch [2008:85]).

Among his many other activities, Larry held a key post as instructor and director of a marine ecology course, taught at the Marine Biological Laboratory at Woods Hole for many years in the 1960s, that served as a training ground for prominent ecologists. He was a visiting scholar at Hebrew University, Tel Aviv University, and Ben-Gurion University, as well as the Weizman Institute, in Israel; he was twice a Guggenheim Fellow, twice a Fulbright Fellow, and a fellow of the Woodrow Wilson International Center for Scholars. He was honored by being elected as Fellow of the American Academy of Arts and Sciences

and as Foreign Member of the Linnaean Society of London. He was president of the American Society of Naturalists in 1985 and the Society for General Systems Research in 1969.

In 2005, Slobodkin, then Emeritus Professor of Ecology and Evolution at Stony Brook University, was named Eminent Ecologist by the Ecological Society of America (Menke 2005). When asked to write a piece for the Ecological Society of America's series, *What Do Ecologists Do?* (now called *Focus on Ecologists*), after receiving the award, Larry wrote, "My own advice on career development is that there are three career paths open and it is wise to excel at one of them: the first is to become an expert on some group of organisms that excites you…. Second, you [could] become very good at the most popular current techniques at the highest technical level you can imagine. In contrast, you can take the third, and most dangerous, path. You can strenuously avoid doing what everyone else is doing and search for new ideas and new tests for old ideas" (Slobodkin 2005). Larry Slobodkin followed, with intensity, that third and most perilous path.

Slobodkin often had a prescient view of connections that would later become more widely appreciated. For example, in the introduction to *Growth and Regulation of Animal Populations* (Slobodkin 1961), he expanded on Hutchinson's early warning (see Slobodkin and Slack 1999) regarding the potential effects on earth's climate of ever-increasing levels of carbon dioxide in the atmosphere, from deforestation and the burning of fossil fuels—"not my original idea," as he readily admitted (Slobodkin 2009), but certainly its first appearance in the context of a book on ecology for ecologists. In 1988, regarding the urgency of addressing major environmental crises, he wrote, "We are not doing the obvious things that need doing. We know, for example, that satellites can provide ecologically important observations if their eyes are turned toward Earth and the resultant data are made generally available. This ought to be considered while NASA gropes for a post-shuttle mission" (Slobodkin 1988).

Slobodkin's appetite for books and learning was insatiable. His research and writings were infused with erudition and wit that extended to his lectures and conversations. Among his publications are nearly 50 book reviews (see the *Bibliography* below), with enlightening, entertaining, incisive, and sometimes acerbic commentary on many of the most important books in ecology, evolutionary biology, behavior, and human biology to appear over the past half century. Slobodkin could be devastatingly critical, but he could be equally generous of praise. In his review of a book on the history of the British Ecological Society (Slobodkin 1988), he wrote:

> *The British Ecological Society emerges as an intellectually self-conscious and deeply respectable group of scientists who are entitled to pride in their devotion and accomplishments…. Out of intellect and passion there has developed a British, and generally Old World, tradition of painstaking, long-term, field investigation, which, though it may not have high prestige among the hot sciences of the universities, has enormous value.*

Larry's quick and sophisticated wit, infusing both his conversation and teaching, was legendary. As a graduate student teaching assistant in zoology at the University of Michigan, one of us listened to his lectures, held in a basement-level auditorium where the podium was flanked by a door to the building's loading dock. As he described the musical genius that blessed successive generations of the Bach family to illustrate principles of heredity, a great clattering of garbage cans issued from the loading area. The

noise had hardly stopped when Slobodkin quipped, "The janitors here prefer Tchaikovsky."

From Larry's writings and lectures, one learned such delighfully obscure words as *pullulating*, *billingsgate*, *sumptuary*, and one of his favorites, *quasi-cabalistic*. Here is a selection of his wit and wisdom (all from his autobiographical essay [Slobodkin 2009], except as noted)

> *As a new graduate student, I believed all published scientific results and all I heard in lectures, an opinion I have since revised.*
>
> *Simply discarding scientific theory because of its age, as if it were spoiled milk, can force us to repeat the same investigation endlessly. A theory may be corrected or modified by later research, but not discarded for mere age.*
>
> *To reinforce an idea by repetition is not always a sign of weakness or cowardice. If they didn't get it at first, say it some other way and perhaps it will break through.*
>
> *The primary argument for the continued use of logistic equations is that they are simple and convenient. In terms of explaining the world, angels are equally convenient and perhaps prettier, if not simpler.*
>
> *Before the advent of Popperian zealotry, null hypotheses were known to biologists primarily as biometric tools* (Slobodkin 1987).
>
> *Human decisions mold the evolutionary process, but human decision-makers cannot rely on evolutionary events or theories to provide them with rectitude, safety or sanctity* (Slobodkin 1977).
>
> *I feel that I have been lucky in various ways and have also failed in various ways. I do claim that what ecologists have done—and I, my students, and my friends were active participants in the process—is to change humanity's sense of itself as an inhabitant of the planet.*

No one who knew Larry Slobodkin will forget his ability to express an idea, an explanation, or his own experiences in the most incisive and humorous way. His ability to recall poetry, biblical references, arcane historical anecdotes, or Jewish jokes to fit any situation was legendary. He was vocally liberal and sensitive to the needs and feelings of immigrants and others who he thought might feel marginalized. He was an inspiration to students, colleagues, friends, and family.

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