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# *Pesticides and the Living Landscape*

By

ROBERT L. RUDD

Madison: The University of Wisconsin Press. 1964.

Pp. xiv, 320, \$6.50

Writing on another theme, Yale biologist Edward S. Deevey<sup>1</sup> inadvertently provided the perfect capsule summary of the pesticide dilemma when he wrote, "The naive and mischievous notion that biology is reducible to chemistry is held by many chemists, a few biologists, and an inordinate number of college deans."

The naivety is excusable as an historical accident because physics and chemistry had to solve their major problems before biology could outgrow its descriptive phase. It is only now, as biology exploits the contributions that the physical sciences have made to an understanding of the substrate of life, that ecology, the ultimate science, can become dynamic. The mischief this intellectual lag has caused is also understandable, but less excusable. It occurred because scientists who have not yet outgrown nineteenth century positivism allowed technology to outrun them. We have yet to come to terms with the tremendous power technoscience has given us.

In this book, Rudd, who is one of the pioneer students<sup>2</sup> of the effects of the new chemical pesticides in the landscape, closes the serious gap between current practice and our knowledge of its effects. It is the most rounded statement of the pros and cons of attempting to rely on synthetic chemicals to control pests, and it is easy to read, if not so lyric as the book<sup>3</sup> that precipitated a national soul-searching.

In a short first chapter, Rudd summarizes the choices open to us in coping with both vertebrate and invertebrate "pests" that have so long plagued man's agriculture and his health and grow more difficult to keep in check the more we multiply our numbers and our demands. This is his thesis: that our only choices are (1) to work with nature in keeping pest populations under control, or (2) to press for an increasingly synthetic landscape, where man takes on the task, and the risks, of keeping all factors in balance. The choices

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1. Deevey, *Environments of the Geologic Past*, Science, Feb. 5, 1965.

2. Rudd & Genelly, *Pesticides: Their Use and Toxicity in Relation to Wildlife* (Cal. Dep't of Fish and Game 1956).

3. Carson, *Silent Spring* (Houghton Mifflin Co. 1962).

are not academic because a brilliant and aggressive minority is already pressing for the second alternative.

A sixty-page section then provides a review of the elements of current practice and regulations that suffer, Rudd feels, from an inadequate statement of the problem, and must perforce also be inadequate. It is a clear indictment of the eradication philosophy of the control entomologists and of the predator control work of the past two decades that, in the name of science, overlooked or disregarded basic ecology and must therefore be labelled cosmic tinkering. This will be a useful summary even for those who have already read widely in this field. Though Rudd early states his commitment to the ecological approach, there is no downgrading of the successes of other approaches, except as they have created new problems or made their own problems more difficult. This reviewer feels that there is a leaning-over-backward to give credit where perhaps less is due, but this point is made only to stress that Rudd is conservative, calm, and generous in his appraisals.

The sixteen short chapters that follow—the bulk of the book—provide a good discussion of the responses of animals and environments to chemical control (the problems of resistance and residues), and the ecological effects of adding persistent chemicals as a new environmental parameter (food-chain poisoning and pest-creation). These 183 pages introduce the ecologist's understanding of the dynamic interrelationships that exist in living communities; they are "facts" that have so far been widely disregarded.

Though it is not otherwise emphasized, one of the most damning pieces of evidence against chemical control philosophy presented in this book is the history of the spread of resistance in insect populations (pp. 143-44). This evolutionary phenomenon, which seemed to startle everyone as though it were new to science in 1946, was actually first observed in 1908, and again—for different combinations of chemicals and insects—in 1916, 1928, 1935, 1938, 1939, and 1942. Since 1946 resistance has spread to over 120 species of arthropods and a few short-lived vertebrates.

The only point I care to quibble with is the statement that "The 'before and after' spraying censuses conducted by trained ornithologists can be depended on to give good relative counts."<sup>4</sup> This is so only where the influence of repopulation has been measured.<sup>5</sup>

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4. P. 120.

5. Stewart & Aldrich, *Removal and Repopulation of Breeding Birds in a Spruce-Fir Forest Community*, 68 *Auk* 471 (1951).

Ecological discussions are difficult to summarize because the ecologist's attempt to see things whole is as important as his facts. Technologists have been guilty of truncating reality, so Rudd's book is a valuable contribution to the dialogue we must encourage if we are to face our alternatives intelligently. The book contains an excellent bibliography, but the index is skimpy. An appendix reprints the recommendations of the President's Science Advisory Committee on the use of pesticides.<sup>6</sup>

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6. Clement, Book Review, 4 *Natural Resources J.* 246 (1964).

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