

## The Lies of Rachel Carson

by Dr. J. Gordon Edwards

(Full text, without tables and illustrations, from the Summer 1992 *21st Century*)

A well-known entomologist documents some of the misstatements in Carson's *Silent Spring*, the 1962 book that poisoned public opinion against DDT and other pesticides.



Entomologist  
J. Gordon Edwards

In 1962, when Rachel Carson published her book *Silent Spring*, I was delighted. I belonged to several environmental-type organizations, had no feelings of respect for industry or big business, had one of my own books published by the Sierra Club, and I had written articles for *The Indiana Waltonian*, *Audubon Magazine*, and other environmental magazines.

At the time, I had been engaged in field work at the University of Wyoming research station in Jackson Hole, Wyoming, for three summers and I worked as biological coordinator for the National Park Service in Glacier National Park. I eagerly read the condensed version of *Silent Spring* in the *New Yorker* magazine and bought a copy of the book as soon as I could find it in the stores. As I read the first several chapters I noticed many statements that I realized were false; however, one can overlook such things when they are produced by one's cohorts, and I did just that.

As I neared the middle of the book, the feeling grew in my mind that Rachel Carson was really playing loose with the facts and was also deliberately wording many sentences in such a way as to make them imply certain things without actually saying them. She was carefully omitting everything that failed to support her thesis that pesticides were *bad*, that industry was *bad*, and that any scientists who did not support her views were *bad*.

I then took notice of her bibliography and realized that it was filled with references from very unscientific sources. Also, each reference was cited separately each time it appeared in the book, thus producing an impressive array of "references" even though not many different sources were actually cited. I began to lose confidence in Rachel Carson, even though I thought that as an environmentalist I really should continue to support her.

I next looked up some of the references that Carson cited and quickly found that they did *not* support her contentions about the harm caused by pesticides. When leading scientists began to publish harsh criticisms of her methods and her allegations, it slowly dawned on me that Rachel Carson was not interested in the truth about those topics, and that I really was being duped, along with millions of other Americans.

As a result, I went back to the beginning of the book and read it all again, but *this* time my eyes were open and I was not lulled into believing that her motives were noble and that her statements could be supported by logic and by scientific fact. I wrote my comments down in rough draft style, and gathered together the scientific articles that refuted what Carson had reported the articles indicated. It was a most frustrating experience.

Finally, I began to join the detractors of *Silent Spring*, and when hearings were held to determine the fate of DDT in various states of this nation, I paid my own way to some of them so that I could testify against the efforts to ban that life-saving insecticide. It was gratifying to find that great numbers of scientists and health officials whom I had always held in high esteem were also testifying at those hearings, in defense of DDT and in

opposition to the rising tide of antipesticide propaganda in environmental publications and in the media.

In testifying and speaking in public, I frequently exposed the misleading references Rachel Carson had cited in her book, presenting her statements from *Silent Spring* and then reading the truth from the actual publications she was purporting to characterize. This revealed to the audiences just how untruthful and misleading the allegations of *Silent Spring* really were.

Now, nearly 30 years later, the controversy is still boiling about how truthful Rachel Carson was. I recently learned that a movie honoring Rachel Carson and *Silent Spring* is being made for television. Because I believe such a movie would further misinform the public, the media, and our legislators, I decided to type up my original rough notes from 1962-1963 and make them available. Here they are, page by page, starting with her dedication.

### **Dedication: A Lie**

**Dedication.** In the front of the book, Carson dedicates *Silent Spring* as follows: "To Albert Schweitzer who said 'Man has lost the capacity to foresee and to forestall. He will end by destroying the Earth.'"

This appears to indicate that the great man opposed the use of insecticides. However, in his autobiography Schweitzer writes, on page 262: "How much labor and waste of time these wicked insects do cause us ... but a ray of hope, in the use of DDT, is now held out to us." Upon reading his book, it is clear that Schweitzer was worried about nuclear warfare, not about the hazards from DDT!

*Page 16.* Carson says that before World War II, while developing agents of chemical warfare, it was found that some of the chemicals created in the laboratory were lethal to insects. "The discovery did not come by chance: insects were widely used to test chemicals as agents of death for man." Carson thus seeks to tie insecticides to chemical warfare. However, DDT was never tested as an "agent of death for man." It was always known to be nonhazardous to humans! Her implication is despicable.

*Page 16.* Carson says the pre-war insecticides were simple inorganic insecticides but her examples include pyrethrum and rotenone, which are complex organic chemicals.

*Page 17.* Carson says arsenic is a carcinogen (identified from chimney soot) and mentions a great many horrible ways in which it is violently poisonous to vertebrates. She then says (page 18): "Modern insecticides are still more deadly," and she makes a special mention of DDT as an example.

This implication that DDT is horribly deadly is completely false. Human volunteers have ingested as much as 35 milligrams of it a day for nearly two years and suffered no adverse affects. Millions of people have lived with DDT intimately during the mosquito spray programs and nobody even got sick as a result. The National Academy of Sciences concluded in 1965 that "in a little more than two decades, DDT has prevented 500 million [human] deaths that would otherwise have been inevitable." The World Health Organization stated that DDT had "killed more insects and saved more people than any other substance." A leading British scientist pointed out that "If the pressure groups *had* succeeded, if there *had* been a world ban on DDT, then Rachel Carson and *Silent Spring* would now be killing more people in a single year than Hitler killed in his whole holocaust."

It is a travesty, therefore, if Rachel Carson's all-out attack on DDT results in any programs lauding her efforts to ban DDT and other life-saving chemicals!

*Page 18.* Referring to chlorinated hydrocarbon insecticides (like DDT) and organophosphates (like malathion), Carson says they are *all* “built on a basis of carbon atoms, which are also the indispensable building blocks of the living world, and thus classed as ‘organic.’ To understand them we must see how they are made, and how they lend themselves to the modifications which make them agents of death.”

Surely it is unfair of Carson to imply that all insecticides are “agents of death” for animals other than insects.

*Page 21.* After referring to untruthful allegations that persons ingesting as little as one tenth of a part per million (ppm) of DDT will then store “about 10 to 15 ppm,” Carson states that “such substances are so potent that a minute quantity can bring about vast changes in the body.” (She does not consider the metabolism and breakdown of DDT in humans and other vertebrates, and their excretion in urine, and so on, which prevents the alleged “biological magnification” up food chains from actually occurring.) Carson then states: “In animal experiments, 3 parts per million [of DDT] has been found to inhibit an essential enzyme in heart muscle; only 5 parts per million has brought about necrosis or disintegration of liver cells. ...” This *implies* that considerable harm to one’s health might result from traces of DDT in the diet, but there has been *no* medical indication that her statements are true.

On page 22, Carson adds, “... we know that the average person is storing potentially harmful amounts.” *This is totally false!*

*Page 23.* Carson says, “the Food and Drug Administration forbids the presence of insecticide residues in milk shipped in interstate commerce.” This is not true, either! The permissible level was 0.5 ppm in milk being shipped interstate.

*Page 24.* Carson says: “One victim who accidentally spilled a 25 percent industrial solution [of chlordane] on the skin developed symptoms of poisoning within 40 minutes and died before medical help could be obtained. No reliance can be placed on receiving advance warning which might allow treatment to be had in time.”

The actual details regarding this accident were readily available at the time, but Carson evidently chose to distort them. The accident occurred in 1949 in the chemical formulation plant, when a worker spilled a large quantity down the front of her body. The liquid contained 25 pounds of chlordane, 39 pounds of solvent, and 10 pounds of emulsifier (*Journal of the American Medical Association, Aug. 13, 1955*). *Carson’s reference to this as a “25 percent solution” spilled on the skin certainly underplays the severity of that drenching, which was the only account known of such a deadly contamination during the history of chlordane formulation.*

*Page 28.* Carson refers to the origin of organophosphate insecticides like parathion (the insecticide that EPA Administrator William Ruckelshaus recommended as the substitute for DDT). She states that the insecticidal properties of organophosphates were “discovered by a German chemist, Gerhard Schrader, in the late 1930s” and that “Some became the deadly nerve gases. Others, of closely allied structure, became insecticides.”

Actually, the insecticides of that nature were not discovered until after World War II (15 years later than Carson implied) and the similarity of insecticides to the dreaded nerve gases was greatly exaggerated by Carson. Carson’s attempt to spread terror about beneficial insecticides becomes even more vicious:

Pages 36-37. Carson says: "Among the herbicides are some that are classed as 'mutagens,' or agents capable of modifying the genes, the materials of heredity. We are rightly appalled by the genetic effects of radiation; how then can we be indifferent to the same effect in chemicals that we disseminate widely in our environment?"

Carson's comparison between "radiation" and common herbicides is despicable, for there is a tremendous difference between their mutagenic potentials.

Page 40. Carson claims that "an appalling deluge of chemical pollution is daily poured into the nation's waterways," that "Most of them are so stable that they cannot be broken down by ordinary processes," and that "Often they cannot even be identified."

These are obviously overstatements designed to worry the reader by using frightening words and intimating that *nobody* knows *what* death-dealing chemicals are in the average person's drinking water. Of course, if they can be detected, they can be identified. The amount of pollutants entering the drinking water of the country was repeatedly analyzed by experts and was found to be below levels that might cause human illness in homes. Carson's scare-mongering statements would fit more appropriately in the pages of today's supermarket tabloids.

Pages 50-51. Carson writes that: "Arsenic, the environmental substance most clearly established as causing cancer in man, is involved in two historic cases in which polluted water supplies caused widespread occurrence of cancer."

I have seen no proof that arsenic causes *cancer* in humans, and it is known to occur naturally in most kinds of shellfish and other marine life. And, if she were really concerned about public health, Carson should have rejoiced to see that relatively harmless insecticides like DDT were capable of replacing arsenicals and other poisonous inorganic materials!

Page 78. Referring to "weeds" (which are such foes of healthy crops that they must be decimated before the crops can mature and be harvested, Carson states: "Presumably the weed is taking something from the soil; perhaps it is also contributing something to it."

She is obviously correct about weeds taking something from the soil as every gardener knows by sad experience, but it takes a tremendous stretch of the imagination to suggest that weeds are *desirable* in fields of crops!

Carson then refers to a city park in Holland where the soil around the roses was heavily infested by nematodes. Planting marigolds among the roses resulted in the death of the nematodes, she claims, and the roses then flourished. No reference was cited. Based on this unsubstantiated story, Carson concludes that "other plants that we ruthlessly eradicate may be performing a function that is necessary to the health of the soil."

So, soil with nematodes was just unhealthy anyway, but fields where weeds have crowded out the food crops had healthier soil even before crops were planted? Everyone who personally grows desirable plants will surely disagree with her!

Page 80. Carson says: "Crabgrass exists only in an unhealthy lawn. It is a symptom, not a disease in itself." When the soil is healthy and fertile it is an environment in which crabgrass cannot grow, she says, because other grasses will prevent it from surviving.

Persons who have had crabgrass invade their beautiful lawn will quite rightly object to this wild unsubstantiated statement.

"Astonishing amounts of crabgrass killers" are placed on lawns each year, including

mercury, arsenic, and chlordane, she says, relishing the stupidity of nurserymen who have a lifetime of experience. She then cites examples where they “apply 60 pounds of technical chlordane to the acre if they follow directions. If they use another of the many available products, they are applying 175 pounds of metallic arsenic to the acre [highly questionable]. The toll of dead birds is distressing. ... How lethal these lawns may be for human beings is unknown.”

*Page 85.* Carson says we are “adding... a new kind of havoc—the direct killing of birds, mammals, fishes, and indeed practically every form of wildlife by chemical insecticides indiscriminately sprayed on the land.”

Is it possible that Carson was unaware of the great *increases* in mammals and game birds harvested by hunters during the years of greatest use of the modern insecticides to which she objects? Is it possible that she was unaware of the tremendous *increases* in most kinds of North American birds, as documented year after year by participants in the Audubon Christmas Bird Counts? (That abundance was proven by the numbers of birds counted, *per observer*, on those counts.) The major things that limited numbers of fish during the “DDT years” was the increasing competition among hordes of fishermen, the damming of multitudes of streams, and the sewage produced by our burgeoning population of healthy, well-fed American people.

Instead of recognizing and appreciating *these documented increases of wildlife*, Carson says bitterly (page 85): “[Nothing must get in the way of the man with the spray gun. ... The incidental victims of his crusade against insects count as nothing; if robins, pheasants, raccoons, cats, or even livestock happen to inhabit the same bit of earth as the target insects and to be hit by the rain of insect-killing poisons no one must protest.”

*Page 87.* Carson bemoans the efforts to control the Japanese beetles in Detroit in 1959, saying, “Little need was shown for this drastic and dangerous action.” She then says that a naturalist in Michigan, who she claimed was very well informed, stated that the Japanese beetle had been present in Detroit for more than 30 years. (No *entomologist* had ever seen one there.) Carson’s naturalist also said that the beetles had not increased there during all that time.

Perhaps she misquoted the naturalist, or perhaps he was just lying, or maybe he simply did not recognize the local *Strigoderma* beetles that faintly resemble Japanese beetles. Certainly it is impossible that the voracious Japanese beetles were actually present there for 30 years, remaining hidden from all entomologists and home-owners! Everywhere those beetles have invaded they quickly multiplied to a pest status within a few years, causing tremendous damage to flowers, fruits, and (as larvae) destroying the roots of grasses and other plants. Even Rachel Carson should not expect us to believe that in Detroit they displayed entirely different behavior. ...

*Page 88.* Regarding those Japanese beetles, Carson said that the midwestern states “have launched an attack worthy of the most deadly enemy instead of only a moderately destructive insect.” Thousands of residents of the eastern United States laughed at that ridiculous statement because they had personally experienced the devastation caused by the beetles and their larvae. Incredibly, Carson insisted (page 96) that the Japanese beetle by 1945 “had become a pest of only minor importance. ...”

*Page 97.* Carson discusses the use of spores of “milky disease” placed in the soil to kill the beetle larvae, and expresses tremendous confidence in the ability of that bacterium to eradicate them there. As to why they did not fight the epidemic in Michigan by simply using these spores, she explains that it was considered too expensive.

Carson reveals with pleasure the fact that they infect at least 40 other species of beetles, but expresses no concern for environmental harm caused by such a broad-spectrum killer of native insects. To the contrary, on page 99 she attacks the use of pesticides because they "... are not selective poisons; they do not single out the one species of which we desire to be rid." Evidently she felt that it was all right for bacteria to be broad spectrum poisons, but that pesticides must affect only a single target.

### **Birds Vs. Human Deaths**

*Page 99.* Carson vividly describes the death of a bird that she thought may have been poisoned by a pesticide, but nowhere in the book does she describe the deaths of any of the people who were dying of malaria, yellow fever, plague, sleeping sickness, or other diseases that are transmitted by insects. Her propaganda in *Silent Spring* contributed greatly to the banning of insecticides that were capable of preventing human deaths. Carson shares the responsibility for literally millions of deaths among the poor people in underdeveloped nations. Dr. William Bowers, head of the Entomology Department at the University of Arizona, said in 1986 that DDT is the most significant discovery of all time, and "in malaria control alone it saved almost 3 billion lives."

Rachel Carson's lack of concern for human lives endangered by diseases transmitted by insects is revealed on page 187, where she writes: "Only yesterday mankind lived in fear of the scourges of smallpox, cholera and plague that once swept nations before them. Now our major concern is no longer with the disease organisms that once were omnipresent; sanitation, better living conditions, and new drugs have given us a high degree of control over infectious disease. Today we are concerned with a different kind of hazard that lurks in our environment—a hazard we ourselves have introduced into our world as our modern way of life has evolved."

Surely Carson was aware that the greatest threats to humans are diseases such as malaria, typhus, yellow fever, Chagas's disease, African sleeping sickness, and a number of types of Leishmaniasis and tick-borne bacterial and rickettsial diseases. She deliberately avoids mentioning any of these, because they could be controlled only by the appropriate use of insecticides, especially DDT. Carson evidently preferred to sacrifice those millions of lives rather than advocate any usage of such chemicals.

*Page 106.* In Lansing, Michigan, a spray program began in 1954 against the bark beetles that were transmitting Dutch Elm disease. Carson states "[With local programs for gypsy moth and mosquito control also under way, the rain of chemicals increased to a downpour." She expresses *no* concern for the survival of the magnificent elm trees, the dying oak trees, or the torment of people who lived near hordes of blood-sucking mosquitoes, but has tremendous pity for a few birds that had disappeared from the sprayed areas. These positions brought her very little support from the residents.

Carson praises Michigan State University ornithologist George Wallace, who had *theorized* that robins on the campus were dying because they had eaten earthworms containing DDT from the soil. Many other areas sprayed with DDT did *not* have dying robins, but Carson studiously avoids mentioning that. Wallace also did not mention the high levels of mercury on the ground and in the earthworms (from soil fungicide treatments on the Michigan campus), even though the symptoms displayed by the dying robins were those attributable to mercury poisoning. Instead, Wallace (and Carson) sought to blame only DDT for the deaths.

The dead birds Wallace sent out for subsequent study were analyzed by a method that detected only "total chlorine content" and could not determine what kind of chlorine was present; none was analyzed for mercury contamination). It was obviously highly irresponsible for Wallace and Carson to jump to the conclusion that the Michigan State University robins were being killed by DDT, and especially for Carson to highlight the false

theory in her book long after the truth was evident.

In many feeding experiments birds, including robins, were forced to ingest great quantities of DDT (and its breakdown product, DDE). Wallace did not provide any evidence that indicated the Michigan State University robins may have been killed by those chemicals. Researcher Joseph Hickey at the University of Wisconsin had testified before the Environmental Protection Agency hearings on DDT specifically that he could not kill any robins by overdosing them with DDT because the birds simply passed it through their digestive tract and eliminated it in their feces. Many other feeding experiments by the U.S. Fish and Wildlife Service and various university researchers repeatedly showed that DDT and DDE in the diet could not have killed wild birds under field conditions. If Carson had mentioned these pertinent details it would have devastated her major theme, which continued to be the awful threats posed by DDT to all nonhuman creatures on the face of the Earth. Instead of providing the facts that would clarify such conditions, she spent several more pages on unfounded allegations about DDT and various kinds of birds.

*Page 109.* Carson alleges that because of the spray programs, “Heavy mortality has occurred among about 90 species of birds, including those most familiar to suburbanites and amateur naturalists. ... All the various types of birds are affected—ground feeders, treetop feeders, bark feeders, predators.”

Carson provides no references to confirm that allegation. The Audubon Christmas Bird Counts, in fact, continued to reveal that *more* birds were counted, *per observer*, during the greatest “DDT years,” including those types that Carson had declared to be declining in numbers. When marshes were sprayed with DDT to control the mosquitoes, a common result was a population explosion of birds inhabiting the marshes. The increases evidently occurred because of a reduction in bird diseases that were formerly transmitted by local blood-sucking insects, greater abundance of available food (less plant destruction by insects), and increased quantities of hepatic enzymes produced by the birds as a result of ingesting DDT (these enzymes destroy cancer-causing aflatoxins in birds and other vertebrates).

The flocks of birds—such as red-winged blackbirds—that were produced by the millions in marshes that had been sprayed with DDT caused tremendous damage to grain crops in Ohio and elsewhere. Such destruction was *not* desirable, and if Carson had complained about *that* nobody could have criticized her for it. Instead, she attempted to convince the readers that spraying the marshes caused the *death* of the birds nesting there, despite all the evidence to the contrary.

*Page 111.* Carson says: “All of the treetop feeders, the birds that glean their insect food from the leaves, have disappeared from heavily sprayed areas. ...”

Insecticides temporarily eliminate some insects from sprayed areas, and before others can move in the insectivorous birds cannot find much food there. Carson said the birds had disappeared, and *not* that they had been killed. She later even admitted that their scarcity could be caused by “lack of insects because of spray.”

*Page 118.* Carson writes: “Like the robin, another American bird seems to be on the verge of extinction. This is the national symbol, the eagle.”

In that very same year, 1962, the leading ornithologist in North America also mentioned the status of the robin. That authority was Roger Tory Peterson, who asked in his *Life* magazine Nature library book, *The Birds*, “What is North America’s number one bird?” He then pointed out that it was *the robin!* The Audubon Christmas Bird Count in 1941 (before DDT) was 19,616 robins (only 8.41 seen per observer)—see Table 1. Compare that with the 1960 count of 928,639 robins (or 104.01 per observer). The total was 12 times more

robins seen per observer after all those years of DDT and other “modern pesticide” usage. Carson had to avoid all references to such surveys or her thesis would have been disproved by the evidence.

*Page 119.*: Carson spends two pages discussing the Hawk Mountain, Pennsylvania, counts of migrating raptorial birds. Table 2 summarizes the actual total counts of raptors made there during the years before and during the greatest usage of DDT in North America. Obviously, very few of them decreased in numbers during those years. The numbers of migrating hawks (and eagles) increased from 9,291 in 1946 to 16,163 in 1963, but with considerable fluctuation in intervening years.

*Page 120.* Carson explains the lack of young birds by saying: “... [The reproductive capacity of the birds has been so lowered by some environmental agent that there are now almost no annual additions of young to maintain the race. Exactly this sort of situation has been produced artificially in other birds by various experimenters, notably Dr. James DeWitt of the U.S. Fish and Wildlife Service. Dr. DeWitt’s now classic experiments on the effects of a series of insecticides on quail and pheasants have established the fact that exposure to DDT or related chemicals, even when doing no observable harm to the parent birds, may seriously affect reproduction. ... For example, *quail into whose diet DDT was introduced throughout the breeding season survived and even produced normal numbers of fertile eggs. But few of the eggs hatched*”[emphasis added].

Carson gives no indication of *how many* might be considered as “few eggs hatching.” Perhaps she thought that her readers would never see the rather obscure journal in which DeWitt’s results were published in 1956, the *Journal of Agriculture and Food Chemistry*. Otherwise, she surely would not have so badly misrepresented DeWitt’s results! The dosage he fed the quail was 100 parts per million in all their food every day, which was roughly 3,000 times the daily DDT intake of humans during the years of the greatest DDT use!

The quail did not just hatch “a few” of their eggs, as DeWitt’s data clearly reveal (Table 3). As the published data from DeWitt’s experiments show, the “controls” (those quail with no DDT) hatched 83.9 percent of their eggs, while the DDT-fed quail hatched 75 to 80 percent of theirs. I would not call an 80 percent hatch “few,” especially when the controls hatched only 83.9 percent of their eggs.

Carson either did not read DeWitt’s article, or she deliberately lied about the results of DeWitt’s experiments on pheasants, which were published on the same page. The “controls” hatched only 57.4 percent of their eggs, while the DDT-fed pheasants, (dosed with 50 ppm of DDT in all of their food during the entire year) hatched 80.6 percent of theirs. After two weeks, the DDT chicks had 100 percent survival, while the control chicks only had 94.8 percent survival, and after 8 weeks the DDT chicks had 93.3 percent survival while the control chicks only had 89.7 percent survival. *It was false reporting such as this that caused so many leading scientists in the United States to take Rachel Carson to task.*

*Page 122.* Carson says various birds have been storing up the DDT in the tissues of their bodies. “And like the grebes, the pheasants, the quail, and the robins, they are less and less able to produce young and to preserve the continuity of their race.”

According to DeWitt’s work, *which Carson cited as her source*, the birds that were fed exceedingly high levels of DDT every day hatched nearly as many of their eggs (in quail) to 27 percent *more* of their eggs (in pheasants). The great increases in the numbers of robins were documented in the comments above, in reference to page 118. Carson’s claim, therefore, that those three kinds of birds are less and less able to produce young is remarkably false—and insulting to the reader.

Page 125. Carson writes: “‘Pheasant sickness’ became a well-known phenomenon: birds ‘seek water, become paralyzed and are found on the ditch banks and rice checks quivering,’ *according to one observer*” [emphasis added]. “One observer” is not very credible as a source of scientific information. Is this the best source a science writer like Rachel Carson could supply?

Carson cited Robert L. Rudd and Richard E. Genelly, in an article in *The Condor* magazine, as the source for the information that follows: “The ‘sickness’ comes in the spring, at the time the rice fields are seeded.” This statement is misleading. The sickness may have come in the spring, but it was *not* in the rice fields. Instead, it was in outdoor pens where the birds were held captive, and all of their food contained rice “treated at the rate of one and one-half pounds of DDT per 100 pounds.” Rudd and Genelly state in *The Condor* (March 1955): “This value is equivalent to 15,000 parts per million DDT in the diet.”

This amount represents the highest dosage of DDT I have ever heard of in any experimental animal, and I cannot understand why they would use such an extreme concentration. This means that 1.5 percent of every bite of food was “poison.”

And what were the results of this remarkable feeding experiment? As reported in *Condor*, page 418, four of the birds died “after four or five days” with severe tremors. One died on the tenth day, but never showed any symptoms prior to death. The remaining seven pheasants survived and five of them showed no symptoms. One of the survivors had “slight tremors” and the other had “slight incoordination.” This is a remarkable lack of poisoning, considering the astronomical amount of DDT in their food! I could only surmise that the survivors must have eaten very little of the poisoned food. (Rudd did not measure the amounts ingested, but simply placed the food in the pen.)

Carson writes that “the concentration of DDT used [in the fields] is many times the amount that will kill an adult pheasant.” In his article, Rudd concluded that it was “clear that DDT-treated grain is *or can be* lethal to grain-eating birds,” but he also stated, “*This mortality may be entirely eliminated by applying chemical and seed separately*” (emphasis added). It appears that Carson’s misleading report of Rudd’s conclusion was designed to deceive the reader regarding DDT hazards in the environment.

The text continues in this vein for another 172 pages, with chapter heads such as “Rivers of Death,” “The Human Price,” “The Rumbblings of an Avalanche,” and “Beyond the Dreams of the Borgias.” I trust that this partial analysis of Carson’s deceptions, false statements, horrible innuendoes, and ridiculous allegations in the first 125 pages of *Silent Spring* will indicate why so many scientists expressed opposition, antagonism, and perhaps even a little rage after reading Carson’s diatribe. No matter how deceitful her prose, however, the influence of Carson’s *Silent Spring* has been very great and it continues 30 years later to shape environmentalist propagand and fund-raising as well as U.S. policy.

*J. Gordon Edwards, professor of entomology at San Jose State University in California, has taught biology and entomology there for 43 years. He is a long-time member of the Sierra Club and the Audubon Society and is a fellow of the California Academy of Sciences.*