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[1962]

A Fable for Tomorrow

THE BRIEF FABLE *with which Carson opens* Silent Spring *is one of the most memorable in contemporary nonfiction and elicited more controversy than almost any other part of the book. Many scientists were appalled that Carson dared begin a book about the science of chemical pesticides with an allegory about the environmental pollution of an imaginary town. Some simply ignored the fact that it was a fable and attacked Carson because the town was not accurately described, while others accused her of writing science fiction throughout. By contrast, most literary critics praised her use of the fable as a brilliant rhetorical device and a creative way of introducing the disturbing subject of the deliberate poisoning of the earth.*

Carson realized her first chapter, originally titled "The Rain of Death," might be too formidable and used the fable as a device to engage the nonscientific reader. In early drafts, Carson gave her town a name, Green Meadows, and centered the action on a young man who returns home after many years only to find his town devastated by ecological havoc. At the urging of her publisher, she rewrote the fable making it clear that the town was a composite of

many communities and became the voice of the fable's narrator. The opening paragraphs recall the once bucolic town of Springdale, Pennsylvania, where Carson grew up, which was subjected to an earlier kind of industrial pollution.

THERE WAS ONCE A TOWN in the heart of America where all life seemed to live in harmony with its surroundings. The town lay in the midst of a checkerboard of prosperous farms, with fields of grain and hillsides of orchards where, in spring, white clouds of bloom drifted above the green fields. In autumn, oak and maple and birch set up a blaze of color that flamed and flickered across a backdrop of pines. Then foxes barked in the hills and deer silently crossed the fields, half hidden in the mists of the fall mornings.

Along the roads, laurel, viburnum and alder, great ferns and wildflowers delighted the traveler's eye through much of the year. Even in winter the roadsides were places of beauty, where countless birds came to feed on the berries and on the seed heads of the dried weeds rising above the snow. The countryside was, in fact, famous for the abundance and variety of its bird life, and when the flood of migrants was pouring through in spring and fall people traveled from great distances to observe them. Others came to fish the streams, which flowed clear and cold out of the hills and contained shady pools where trout lay. So it had been from the days many years ago when the first settlers raised their houses, sank their wells, and built their barns.

Then a strange blight crept over the area and everything began to change. Some evil spell had settled on the community: mysterious maladies swept the flocks of chickens; the cattle and sheep sickened and died. Everywhere was a shadow of death. The farmers spoke of much illness among their families. In the

town the doctors had become more and more puzzled by new kinds of sickness appearing among their patients. There had been several sudden and unexplained deaths, not only among adults but even among children, who would be stricken suddenly while at play and die within a few hours.

There was a strange stillness. The birds, for example – where had they gone? Many people spoke of them, puzzled and disturbed. The feeding stations in the backyards were deserted. The few birds seen anywhere were moribund; they trembled violently and could not fly. It was a spring without voices. On the mornings that had once throbbed with the dawn chorus of robins, catbirds, doves, jays, wrens, and scores of other bird voices there was now no sound; only silence lay over the fields and woods and marsh.

On the farms the hens brooded, but no chicks hatched. The farmers complained that they were unable to raise any pigs – the litters were small and the young survived only a few days. The apple trees were coming into bloom but no bees droned among the blossoms, so there was no pollination and there would be no fruit.

The roadsides, once so attractive, were now lined with browned and withered vegetation as though swept by fire. These, too, were silent, deserted by all living things. Even the streams were now lifeless. Anglers no longer visited them, for all the fish had died.

In the gutters under the eaves and between the shingles of the roofs, a white granular powder still showed a few patches; some weeks before it had fallen like snow upon the roofs and the lawns, the fields and streams.

No witchcraft, no enemy action had silenced the rebirth of new life in this stricken world. The people had done it themselves.

* * *

This town does not actually exist, but it might easily have a thousand counterparts in America or elsewhere in the world. I know of no community that has experienced all the misfortunes I describe. Yet every one of these disasters has actually happened somewhere, and many real communities have already suffered a substantial number of them. A grim specter has crept upon us almost unnoticed, and this imagined tragedy may easily become a stark reality we all shall know.

What has already silenced the voices of spring in countless towns in America? This book is an attempt to explain.

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[1962]

Women's National Press Club Speech

SILENT SPRING WAS SERIALIZED *in three summer issues of the* New Yorker *in 1962 and published in late September. The high level of public interest that surrounded the book included notice by President John F. Kennedy, who convened a special panel of the President's Science Advisory Committee to look into the problem, the introduction of legislation in several states seeking to halt the spraying of pesticides without citizen notification, and general uproar in the agricultural chemical industry and among government scientists.*

Carson took many of her critics in stride, but she could not abide those that damned the book without having read it. As debate grew more acrimonious in the fall of 1962, Carson's public remarks grew sharper, culminating in her appearance at the Women's National Press Club in December. In this speech, Carson attacked the smugly self-satisfied chemical industry and exposed their counterparts in industry-funded research institutions.

With national television cameras rolling, Carson charged that basic scientific truths were being compromised "to serve the gods of profit and production."

MY TEXT THIS AFTERNOON is taken from the *Globe Times* of Bethlehem, Pa., a news item in the issue of October 12. After describing in detail the adverse reactions to *Silent Spring* of the farm bureaus in two Pennsylvania counties, the reporter continued: "No one in either county farm office who was talked to today had read the book, but all disapproved of it heartily."

This sums up very neatly the background of much of the noisier comment that has been heard in this unquiet autumn following the publication of *Silent Spring*. In the words of an editorial in the *Bennington Banner*, "The anguished reaction to *Silent Spring* has been to refute statements that were never made." Whether this kind of refutation comes from people who actually have not read the book or from those who find it convenient to misrepresent my position I leave it to others to judge.

Early in the summer – as soon as the first installment of the book appeared in the *New Yorker* – public reaction to *Silent Spring* was reflected in a tidal wave of letters – letters to Congressmen, to newspapers, to Government agencies, to the author. These letters continue to come and I am sure represent the most important and lasting reaction.

Even before the book was published, editorials and columns by the hundred had discussed it all over the country. Early reaction in the chemical press was somewhat moderate, and in fact I have had fine support from some segments of both chemical and agricultural press. But in general, as was to be expected, the industry press was not happy. By late summer the printing presses of the pesticide industry and their trade associations had begun to pour out the first of a growing stream of booklets designed to protect and repair the somewhat battered image of pesticides. Plans are announced for quarterly mailings to opinion leaders and for monthly news stories to newspapers, magazines, radio, and television. Speakers are addressing audiences everywhere.

It is clear that we are all to receive heavy doses of tranquilizing information, designed to lull the public into the sleep from which *Silent Spring* so rudely awakened it. Some definite gains toward a saner policy of pest control have been made in recent months. The important issue now is whether we are to hold and extend those gains.

The attack is now falling into a definite pattern and all the well-known devices are being used. One obvious way to try to weaken a cause is to discredit the person who champions it. So the masters of invective and insinuation have been busy: I am a "bird lover – a cat lover – a fish lover" – a priestess of nature – a devotee of a mystical cult having to do with laws of the universe which my critics consider themselves immune to.

Another piece in the pattern of attack largely ignores *Silent Spring* and concentrates on what I suppose would be called the soft sell, the soothing reassurances to the public. Some of these acknowledge the correctness of my facts, but say that the incidents I reported occurred some time in the past, that industry and Government are well aware of them and have long since taken steps to prevent their recurrence. It must be assumed that the people who read these comforting reports read nothing else in their newspapers. Actually, pesticides have figured rather prominently in the news in recent months: some items trivial, some almost humorous, some definitely serious.

These reports do not differ in any important way from the examples I cited in *Silent Spring*, so if the situation is under better control there is little evidence of it.

What are some of the ways pesticides have made recent news?

1. The *New York Post* of October 12 reported the seizure by the Food and Drug Administration of more than a quarter of a million pounds of potatoes – 346,000 pounds to be exact – in the Pacific Northwest. Agents said they contained about 4 times the permitted residues of aldrin and dieldrin.
2. In September, Federal investigators had to look into the charge that vineyards near the Erie County thruway had been damaged by weed-killer chemicals sprayed along the highway. Similar reports came from Iowa.
3. In California, fumes from lawns to which a chemical had been applied were so obnoxious that the fire department was called to drench the lawns with water. Thereupon the fumes increased so greatly that 11 firemen were hospitalized.
4. Last summer the newspapers widely reported the story of some 5000 Turkish children suffering from an affliction called *porphyria* characterized by severe liver damage and the growth of hair on face, hands, and arms, giving a monkey-like appearance to victims. This was traced to the consumption of wheat treated with a chemical fungicide. The wheat had been intended for planting, rather than for direct consumption. But the people were hungry and perhaps did not understand the restriction. This was an unplanned occurrence in a far part of the world but it is well to remember that large quantities of seed are similarly treated here.
5. You will remember that the bald eagle, our national emblem, is seriously declining in numbers. The Fish and Wildlife Service recently reported significant facts that may explain why this is so. The Service has determined experimentally how much DDT is required to kill an eagle. It has also discovered that eagles found dead in the wild have lethal doses of DDT stored in their tissues.
6. This fall also, Canadian papers carried a warning that woodcock being shot during the hunting season in New Brunswick were carrying residues of heptachlor and might be dangerous if used as food. Woodcock are migratory birds. Those that nest in New Brunswick winter in the southern United States, where heptachlor has been used extensively in the campaign against the fire ant. The residues in the birds were 3 to 3.5 ppm. The legal tolerance for heptachlor is ZERO.
7. Biologists of the Massachusetts Fish and Game Department have recently reported that fish in the Framingham Reservoir on the outskirts of Boston contain DDT in amounts as high as 75 ppm, or more than 10 times the legal tolerance. This is, of course, a public water supply for a large number of people.
8. One more item – an Associated Press dispatch of November 16th: a sad commentary on technology gone wrong. A Federal Court Jury awarded a New York State farmer *$12,360* for damages to his potato crop. The damage was done by a chemical that was supposed to halt sprouting. Instead, the sprouts grew inward.

We are told also that chemicals are never used unless tests have shown them to be safe. This, of course, is not an accurate statement. I am happy to see that the Department of Agriculture plans to ask the Congress to amend the FIFRA to do away with the provision that now permits a company to register a pesticide under protest, even though a question of health or safety has been raised by the Department.

We have other reminders that unsafe chemicals get into use – County Agents frequently have to amend or rescind earlier advices on the use of pesticides. For example, a letter was recently sent out to farmers recalling stocks of a chemical in use as a cat-

tle spray. In September, "unexplained losses" occurred following its use. Several suspected production lots were recalled but the losses continued. All outstanding lots of the chemical have now had to be recalled.

Inaccurate statements in reviews of *Silent Spring* are a dime a dozen, and I shall only mention one or two examples. *Time*, in its discussion of *Silent Spring*, described accidental poisonings from pesticides as *very rare*. Let's look at a few figures. California, the only state that keeps accurate and complete records, reports from 900 to 1000 cases of poisoning from agricultural chemicals per year. About 200 of these are from parathion alone. Florida has experienced so many poisonings recently that this state has attempted to control the use of the more dangerous chemicals in residential areas. As a sample of conditions in other countries, parathion was responsible for 100 deaths in India in 1958 and takes an average of 336 deaths a year in Japan.

It is also worthy of note that during the years 1959, 1960, and 1961, airplane crashes involving crop-dusting planes totaled 873. In these accidents 135 pilots lost their lives. This very fact has led to some significant research by the Federal Aviation Agency through its Civil Aeromedical Unit – research designed to find out *why* so many of these planes crashed. These medical investigators took as their basic premise the assumption that spray poisons accumulate in the pilot's body – inside the cells, where they are difficult to detect.

These researchers recently reported that they had confirmed two very significant facts: 1. That there is a causal relation between the build-up of toxins in the cell and the onset of sugar diabetes. 2. That the build-up of poisons within the cell interferes with the rate of energy production in the human body.

I am, of course, happy to have this confirmation that cellular processes are not so "irrelevant" as a certain scientific reviewer of *Silent Spring* has declared them to be.

This same reviewer, writing in a chemical journal, was much annoyed with me for giving the sources of my information. To identify the person whose views you are quoting is, according to this reviewer, *name-dropping*. Well, times have certainly changed since I received my training in the scientific method at Johns Hopkins! My critic also *profoundly disapproved* of my bibliography. The very fact that it gave complete and specific references for each important statement was extremely distasteful to him. This was *padding* to impress the uninitiated with its length.

Now I would like to say that in *Silent Spring* I have never asked the reader to take *my* word. I have given him a very clear indication of my sources. I make it possible for him – indeed I invite him – to go beyond what I report and get the full picture. This is the reason for the 55 pages of references. You cannot do this if you are trying to conceal or distort or to present half truths.

Another reviewer was offended because I made the statement that it is customary for pesticide manufacturers to support research on chemicals in the universities. Now, this is just common knowledge and I can scarcely believe the reviewer is unaware of it, because his own university is among those receiving such grants.

But since my statement has been challenged, I suggest that any of you who are interested make a few inquiries from representative universities. I am sure you will find out that the practice is very widespread. Actually, a visit to a good scientific library will quickly establish the fact, for it is still generally

the custom for authors of technical papers to acknowledge the source of funds for the investigation. For example, a few gleaned at random from the *Journal of Economic Entomology* are as follows:

1. In a paper from Kansas State University, a footnote states: Partial cost of publication of this paper was met by the Chemagro Corporation.
2. From the University of California Citrus Experimental Station: The authors thank the Diamond Black-Leaf Co., Richmond, Virginia, for grants-in-aid.
3. University of Wisconsin: Research was also supported in part by grants from the Shell Chemical Co., Velsicol Chemical Corporation and Wisconsin Canners Association.
4. Illinois Nat. Hist. Survey: This investigation was sponsored by the Monsanto Chem. Co. of St. Louis, Mo.

A penetrating observer of social problems has pointed out recently that whereas wealthy families once were the chief benefactors of the Universities, now industry has taken over this role. Support of education is something no one quarrels with – but this need not blind us to the fact that research supported by pesticide manufacturers is not likely to be directed at discovering facts indicating unfavorable effects of pesticides.

Such a liaison between science and industry is a growing phenomenon, seen in other areas as well. The AMA, through its newspaper, has just referred physicians to a pesticide trade association for information to help them answer patients' questions about the effects of pesticides on man. I am sure physicians have a need for information on this subject. But I would like to see them referred to authoritative scientific or medical literature – not to a trade organization whose business it is to promote the sale of pesticides.

We see scientific societies acknowledging as "sustaining associates" a dozen or more giants of a related industry. When the scientific organization speaks, whose voice do we hear – that of science? or of the sustaining industry? It might be a less serious situation if this voice were always clearly identified, but the public assumes it is hearing the voice of science.

What does it mean when we see a committee set up to make a supposedly impartial review of a situation, and then discover that the committee is affiliated with the very industry whose profits are at stake? I have this week read two reviews of the recent reports of a National Academy of Sciences Committee on the relations of pesticides to wildlife. These reviews raise disturbing questions. It is important to understand just what this committee is. The two sections of its report that have now been published are frequently cited by the pesticide industry in attempts to refute my statements. The public, I believe, assumes that the Committee is actually part of the Academy. Although appointed by the Academy, its members come from outside. Some are scientists of distinction in their fields. One would suppose the way to get an impartial evaluation of the impact of pesticides on wildlife would be to set up a committee of completely disinterested individuals. But the review appearing this week in *The Atlantic Naturalist* described the composition of the Committee as follows: "A very significant role in this committee is played by the Liaison Representatives. These are of three categories. A.) Supporting Agencies. B.) Government Agencies. C.) Scientific Societies. The supporting agencies are presumably those who supply the hard cash. Forty-three such agencies are listed, including 19 chemical companies comprising the massed might of the chemical industry. In addition, there are at least 4

trade organizations such as the National Agricultural Chemical Association and the National Aviation Trades Association."

The Committee reports begin with a firm statement in support of the use of chemical pesticides. From this predetermined position, it is not surprising to find it mentioning only *some* damage to *some* wildlife. Since, in the modern manner, there is no documentation, one can neither confirm or deny its findings. *The Atlantic Naturalist* reviewer described the reports as "written in the style of a trained public relations official of industry out to placate some segments of the public that are causing trouble."

All of these things raise the question of the communication of scientific knowledge to the public. Is industry becoming a screen through which facts must be filtered, so that the hard, uncomfortable truths are kept back and only the harmless morsels allowed to filter through? I know that many thoughtful scientists are deeply disturbed that their organizations are becoming *fronts* for industry. More than one scientist has raised a disturbing question – whether a spirit of lysenkoism may be developing in America today – the philosophy that perverted and destroyed the science of genetics in Russia and even infiltrated all of that nation's agricultural sciences. But here the tailoring, the screening of basic truth, is done, not to suit a party line, but to accommodate to the short-term gain, to serve the gods of profit and production.

These are matters of the most serious importance to society. I commend their study to you, as professionals in the field of communication.

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[1963]

A New Chapter to *Silent Spring*

AS CARSON LEARNED OF FURTHER INCIDENTS *of pesticide damage and injury from other scientists and from the letters she received from readers, she included this new information every time she spoke in public. Her speeches during this last year of her life reflect her moral conviction that "no civilization can wage relentless war on life without destroying itself, and without losing the right to be called civilized."*

Her address to the women of the Garden Club of America in January, 1963, opened a new, aggressively political phase of the pesticide struggle. Here Carson focused specifically on the economic and political forces that prevented changes in pesticide policy, and she urged individuals to demand change in their communities, encouraging grassroots activities to reform the system.

She also addressed the stream of propaganda that had issued from pesticide trade groups, misinformation that hid their true links to industry behind bland affiliations to research organizations or educational institutions. The speech reveals Carson as a tough and trenchant political infighter who understood the nature of her

opposition, and who wisely directed her message to concerned individuals, such as the activist women of the nation's garden clubs.

I AM PARTICULARLY GLAD to have this opportunity to speak to you. Ever since, ten years ago, you honored me with your Frances Hutchinson medal, I have felt very close to The Garden Club of America. And I should like to pay tribute to you for the quality of your work and for the aims and aspirations of your organization. Through your interest in plant life, your fostering of beauty, your alignment with constructive conservation causes, you promote that onward flow of life that is the essence of our world.

This is a time when forces of a very different nature too often prevail – forces careless of life or deliberately destructive of it and of the essential web of living relationships.

My particular concern, as you know, is with the reckless use of chemicals so unselective in their action that they should more appropriately be called biocides rather than pesticides. Not even their most partisan defenders can claim that their toxic effect is limited to insects or rodents or weeds or whatever the target may be.

The battle for a sane policy for controlling unwanted species will be a long and difficult one. The publication of *Silent Spring* was neither the beginning nor the end of that struggle. I think, however, that it is moving into a new phase, and I would like to assess with you some of the progress that has been made and take a look at the nature of the struggle that lies before us.

We should be very clear about what our cause is. What do we oppose? What do we stand for? If you read some of my industry-oriented reviewers you will think that I am opposed to any efforts to control insects or other organisms. This, of course, is

not my position and I am sure it is not that of The Garden Club of America. We differ from the promoters of biocides chiefly in the means we advocate, rather than the end to be attained.

It is my conviction that if we automatically call in the spray planes or reach for the aerosol bomb when we have an insect problem we are resorting to crude methods of a rather low scientific order. We are being particularly unscientific when we fail to press forward with research that will give us the new kind of weapons we need. Some such weapons now exist – brilliant and imaginative prototypes of what I trust will be the insect control methods of the future. But we need many more, and we need to make better use of those we have. Research men of the Department of Agriculture have told me privately that some of the measures they have developed and tested and turned over to the insect control branch have been quietly put on the shelf.

I criticize the present heavy reliance upon biocides on several grounds: First, on the grounds of their inefficiency. I have here some comparative figures on the toll taken of our crops by insects before and after the DDT era. During the first half of this century, crop loss due to insect attack has been estimated by a leading entomologist at 10 percent a year. It is startling to find, then, that the National Academy of Science last year placed the present crop loss at 25 percent a year. If the percentage of crop loss is increasing at this rate, even as the use of modern insecticides increases, surely something is wrong with the methods used! I would remind you that a non-chemical method gave 100 percent control of the screwworm fly – a degree of success no chemical has ever achieved.

Chemical controls are inefficient also because as now used they promote resistance among insects. The number of insect species resistant to one or more groups of insecticides has risen from about a dozen in pre-DDT days to nearly 150 today. This

is a very serious problem, threatening, as it does, greatly impaired control.

Another measure of inefficiency is the fact that chemicals often provoke resurgences of the very insect they seek to control, because they have killed off its natural controls. Or they cause some other organism suddenly to rise to nuisance status: spider mites, once relatively innocuous, have become a worldwide pest since the advent of DDT.

My other reasons for believing we must turn to other methods of controlling insects have been set forth in detail in *Silent Spring* and I shall not take time to discuss them now. Obviously, it will take time to revolutionize our methods of insect and weed control to the point where dangerous chemicals are minimized. Meanwhile, there is much that can be done to bring about some immediate improvement in the situation through better procedures and controls.

In looking at the pesticide situation today, the most hopeful sign is an awakening of strong public interest and concern. People are beginning to ask questions and to insist upon proper answers instead of meekly acquiescing in whatever spraying programs are proposed. This in itself is a wholesome thing.

There is increasing demand for better legislative control of pesticides. The state of Massachusetts has already set up a Pesticide Board with actual authority. This Board has taken a very necessary step by requiring the licensing of anyone proposing to carry out aerial spraying. Incredible though it may seem, before this was done anyone who had money to hire an airplane could spray where and when he pleased. I am told that the state of Connecticut is now planning an official investigation of spraying practices. And of course on a national scale, the President last summer directed his science advisor to set up a committee of

scientists to review the whole matter of the government's activities in this field.

Citizens groups, too, are becoming active. For example, the Pennsylvania Federation of Women's Clubs recently set up a program to protect the public from the menace of poisons in the environment – a program based on education and promotion of legislation. The National Audubon Society has advocated a 5-point action program involving both state and federal agencies. The North American Wildlife Conference this year will devote an important part of its program to the problem of pesticides. All these developments will serve to keep public attention focused on the problem.

I was amused recently to read a bit of wishful thinking in one of the trade magazines. Industry "can take heart," it said, "from the fact that the main impact of the book (i.e., *Silent Spring*) will occur in the late fall and winter – seasons when consumers are not normally active buyers of insecticides [. . .] it is fairly safe to hope that by March or April *Silent Spring* no longer will be an interesting conversational subject."

If the tone of my mail from readers is any guide, and if the movements that have already been launched gain the expected momentum, this is one prediction that will not come true.

This is not to say that we can afford to be complacent. Although the attitude of the public is showing a refreshing change, there is very little evidence of any reform in spraying practices. Very toxic materials are being applied with solemn official assurances that they will harm neither man nor beast. When wildlife losses are later reported, the same officials deny the evidence or declare the animals must have died from "something else."

Exactly this pattern of events is occurring in a number of areas now. For example, a newspaper in East St. Louis, Illinois,

describes the death of several hundred rabbits, quail and songbirds in areas treated with pellets of the insecticide, dieldrin. One area involved was, ironically, a "game preserve." This was part of a program of Japanese beetle control.

The procedures seem to be the same as those I described in *Silent Spring*, referring to another Illinois community, Sheldon. At Sheldon the destruction of many birds and small mammals amounted almost to annihilation. Yet an Illinois Agriculture official is now quoted as saying dieldrin has no serious effect on animal life.

A significant case history is shaping up now in Norfolk, Virginia. The chemical is the very toxic dieldrin, the target the white fringed beetle, which attacks some farm crops. This situation has several especially interesting features. One is the evident desire of the state agriculture officials to carry out the program with as little advance discussion as possible. When the Outdoor Edition of the *Norfolk Virginian-Pilot* "broke" the story, he reported that officials refused comment on their plans. The Norfolk health officer offered reassuring statements to the public on the grounds that the method of application guaranteed safety: The poison would be injected into the ground by a machine that drills holes in the soil. "A child would have to eat the roots of the grass to get the poison" he is quoted as saying.

However, alert reporters soon proved these assurances to be without foundation. The actual method of application was to be by seeders, blowers and helicopters: the same type of procedure that in Illinois wiped out robins, brown thrashers and meadowlarks, killed sheep in the pastures, and contaminated the forage so that cows gave milk containing poison.

Yet at a hearing of sorts concerned Norfolk citizens were told merely that the State's Department of Agriculture was committed to the program and that it would therefore be carried out.

The fundamental wrong is the authoritarian control that has been vested in the agricultural agencies. There are, after all, many different interests involved: there are problems of water pollution, of soil pollution, of wildlife protection, of public health. Yet the matter is approached as if the agricultural interest were the supreme, or indeed the only one.

It seems to me clear that all such problems should be resolved by a conference of representatives of all the interests involved.

I wonder whether citizens would not do well to be guided by the strong hint given by the Court of Appeals reviewing the so-called DDT case of the Long Island citizens a few years ago.

This group sought an injunction to protect them from a repetition of the gypsy moth spraying. The lower court refused the injunction and the United States Court of Appeals sustained this ruling on the grounds that the spraying had already taken place and could not be enjoined. However, the court made a very significant comment that seems to have been largely overlooked. Regarding the possibility of a repetition of the Long Island spraying, the judges made this significant general comment: ". . . it would seem well to point out the advisability for a district court, faced with a claim concerning aerial spraying or any other program which may cause inconvenience and damage as widespread as this 1957 spraying appears to have caused, to inquire closely into the methods and safeguards of any proposed procedures so that incidents of the seemingly unnecessary and unfortunate nature here disclosed, may be reduced to a minimum, assuming, of course, that the government will have shown such a program to be required in the public interest."

Here the United States Court of Appeals spelled out a procedure whereby citizens may seek relief in the courts from unnecessary, unwise or carelessly executed programs. I hope it will be put to the test in as many situations as possible.

If we are ever to find our way out of the present deplorable situation, we must remain vigilant, we must continue to challenge and to question, we must insist that the burden of proof is on those who would use these chemicals to prove the procedures are safe.

Above all, we must not be deceived by the enormous stream of propaganda that is issuing from the pesticide manufacturers and from industry-related – although ostensibly independent – organizations. There is already a large volume of handouts openly sponsored by the manufacturers. There are other packets of material being issued by some of the state agricultural colleges, as well as by certain organizations whose industry connections are concealed behind a scientific front. This material is going to writers, editors, professional people, and other leaders of opinion.

It is characteristic of this material that it deals in generalities, unsupported by documentation. In its claims for safety to human beings, it ignores the fact that we are engaged in a grim experiment never before attempted. We are subjecting whole populations to exposure to chemicals which animal experiments have proved to be extremely poisonous and in many cases cumulative in their effect. These exposures now begin at or before birth. No one knows what the result will be, because we have no previous experience to guide us.

Let us hope it will not take the equivalent of another thalidomide tragedy to shock us into full awareness of the hazard. Indeed, something almost as shocking has already occurred – a few months ago we were all shocked by newspaper accounts of the tragedy of the Turkish children who have developed a horrid disease through use of an agricultural chemical. To be sure, the use was unintended. The poisoning had been continuing over a period of some seven years, unknown to most of us. What made

it newsworthy in 1962 was the fact that a scientist gave a public report on it.

A disease known as toxic porphyria has turned some 5,000 Turkish children into hairy, monkey-faced beings. The skin becomes sensitive to light and is blotched and blistered. Thick hair covers much of the face and arms. The victims have also suffered severe liver damage. Several hundred such cases were noticed in 1955. Five years later, when a South African physician visited Turkey to study the disease, he found 5,000 victims. The cause was traced to seed wheat which had been treated with a chemical fungicide called hexachlorobenzene. The seed, intended for planting, had instead been ground into flour for bread by the hungry people. Recovery of the victims is slow, and indeed worse may be in store for them. Dr. W. C. Hueper, a specialist on environmental cancer, tells me there is a strong likelihood these unfortunate children may ultimately develop liver cancer.

"This could not happen here," you might easily think.

It would surprise you, then, to know that the use of poisoned seed in our own country is a matter of present concern by the Food and Drug Administration. In recent years there has been a sharp increase in the treatment of seed with chemical fungicides and insecticides of a highly poisonous nature. Two years ago an official of the Food and Drug Administration told me of that agency's fear that treated grain left over at the end of a growing season was finding its way into food channels.

Now, on last October 27, the Food and Drug Administration proposed that all treated food grain seeds be brightly colored so as to be easily distinguishable from untreated seeds or grain intended as food for human beings or livestock. The Food and Drug Administration reported: "FDA has encountered many shipments of wheat, corn, oats, rye, barley, sorghum, and alfalfa seed in which stocks of treated seed left over after the

planting seasons have been mixed with grains and sent to market for food or feed use. Injury to livestock is known to have occurred.

"Numerous federal court seizure actions have been taken against lots of such mixed grains on charges they were adulterated with a poisonous substance. Criminal cases have been brought against some of the shipping firms and individuals.

"Most buyers and users of grains do not have the facilities or scientific equipment to detect the presence of small amounts of treated seed grains if the treated seed is not colored. The FDA proposal would require that all treated seed be colored in sharp contrast to the natural color of the seed, and that the color be so applied that it could not readily be removed. The buyer could then easily detect a mixture containing treated seed grain, and reject the lot."

I understood, however, that objection has been made by some segments of the industry and that this very desirable and necessary requirement may be delayed. This is a specific example of the kind of situation requiring public vigilance and public demand for correction of abuses.

The way is not made easy for those who would defend the public interest. In fact, a new obstacle has recently been created, and a new advantage has been given to those who seek to block remedial legislation. I refer to the income tax bill which becomes effective this year. The bill contains a little known provision which permits certain lobbying expenses to be considered a business expense deduction. It means, to cite a specific example, that the chemical industry may now work at bargain rates to thwart future attempts at regulation.

But what of the nonprofit organizations such as the Garden Clubs, the Audubon Societies and all other such tax-exempt groups? Under existing laws they stand to lose their tax-exempt

status if they devote any "substantial" part of their activities to attempts to influence legislation. The word "substantial" needs to be defined. In practice, even an effort involving less than 5 percent of an organization's activity has been ruled sufficient to cause loss of the tax-exempt status.

What happens, then, when the public interest is pitted against large commercial interests? Those organizations wishing to plead for protection of the public interest do so under the peril of losing the tax-exempt status so necessary to their existence. The industry wishing to pursue its course without legal restraint is now actually subsidized in its efforts.

This is a situation which the Garden Club, and similar organizations, within their legal limitations, might well attempt to remedy.

There are other disturbing factors which I can only suggest. One is the growing interrelations between professional organizations and industry, and between science and industry. For example, the American Medical Association, through its newspaper, has just referred physicians to a pesticide trade association for information to help them answer patients' questions about the effects of pesticides on man. I would like to see physicians referred to authoritative scientific or medical literature – not to a trade organization whose business it is to promote the sale of pesticides.

We see scientific societies acknowledging as "sustaining associates" a dozen or more giants of a related industry. When the scientific organization speaks, whose voice do we hear – that of science or of the sustaining industry? The public assumes it is hearing the voice of science.

Another cause of concern is the increasing size and number of industry grants to the universities. On first thought, such support of education seems desirable, but on reflection we see that

this does not make for unbiased research – it does not promote a truly scientific spirit. To an increasing extent, the man who brings the largest grants to his university becomes an untouchable, with whom even the University president and trustees do not argue.

These are large problems and there is no easy solution. But the problem must be faced.

As you listen to the present controversy about pesticides, I recommend that you ask yourself – Who speaks? – And Why?