

August 10, 1962

Velsicol Chemical Corporation
330 East Grand Avenue
Chicago 11, Illinois

Attention: Mr. Louis A. McLean, Secretary and General Counsel

Gentlemen:

Thank you for your letter of August 2, 1962 concerning Rachel Carson's book, SILENT SPRING.

We would appreciate your furnishing us with a more detailed explanation of the contentions with regard to the five specific statements which you allege are inaccurate.

You state that these are referred to merely by way of illustration, but not as a substantial enumeration. If you know of any other statements in the book which you believe to be untrue, please let us know immediately.

We do not, of course, intend by this letter to acknowledge the accuracy of the assertions in your letter but wish merely to gain all information available reflecting on the matter.

Yours sincerely,

William E. Spaulding

MES/0

Paul Brooks

Yours,

One thing she said interested me particularly, i.e., that she heard someone from Chicago tried to threaten the New York out of publishing the third installment. Do you suppose this was the same company? I'd appreciate it if you'd find this out for me tomorrow and let me know what the story is. If it was the Tolson Corporation, what action, if any, did the New York take?

Here are three copies of the letter from Tolson General Corporation: one for you, one for the New York, and one for Rachel's lawyer. I read her the main points over the telephone and even without her files on hand, she could remember pretty well the courses for the statements quoted. I asked her to run through the other references to Gardner and Hatcher and give me the courses as best she could so that we may judge the fairness of our ground before answering the letter. Of course most of the source documents are in Silver Spring, but I imagine she has most of this in her head.

Dear Rachel:

Mrs. Marie Rodell,
Marie Rodell and Paul Davis, Inc.,
15 East 45th St.,
New York 17, New York.

August 6, 1962.

THE
NEW YORKER

No. 25 WEST 43RD STREET
NEW YORK, 36, N. Y.



July 17, 1962

Confidential excerpt for
Miss Carson's information
only. Taken from letter
received by staff member.

UNIVERSITY OF CALIFORNIA
University Extension

Science and the Citizen
Engineering and Sciences Extension
Berkeley 4, California

July 7, 1962

I have enclosed a recent copy of our Science Guide. We are expanding in size and circulation so when we reprint the Bernstein piece early this fall it will appear in a larger issue. But I thought you might be interested in an incident that occurred relating to the Rachel Carson series the New Yorker is publishing. You will notice that on the front page we referred our readers to the first part of the series. This is our main function --- "guiding" people to other sources of science information.

The day following the appearance of this issue someone within the University made a confidential call to the University Public Information Officer in charge of science news releases. The substance of the call as relayed to us by P.I.O. (without telling us who the caller was) was to the effect that Rachel Carson is not a chemist, the University has a number of chemists working on insecticides, and this is a controversial question which it would be better not to discuss in a bulletin distributed by the University.

So, I'm sorry to say we did not abstract the second and third parts of the series in our next issues. I have no way of fighting this sort of censorship at the present time unfortunately. However, we are financed by National Science Foundation funds which are only administered by the University and before long we expect to separate the Guide from the University. In a way I'm glad this incident occurred because it provides me with an excellent argument in favor of establishing an independent journal of science criticism.

I thought this might be of interest to the editors of your magazine, though I imagine it's a very minor kind of annoyance compared to the economic pressures that must be exerted by chemical interests when you do a series like "The Silent Spring".

If it's of particular interest to Rachel Carson or anyone else you might relate this incident to her sometime. For the time being, I would prefer that it not become "public" information exactly. However, I doubt that I will be with the University when this particular grant has expired and after that it won't make any difference.

Sincerely,
(signed) John Martinson
Program Co-ordinator

West-Southport, Me.
Aug. 8, 1962

Dear Paul,

Your letter (or rather Valsicol's) didn't reach me yesterday because it didn't leave Boston until then; The Boston postmark is Aug. 7, West Southport 9 a.m. Aug 8th. We have no Special Delivery service here, but theoretically it may speed a letter between postoffices.

Marie said last night she was urging you to make only routine acknowledgement of the letter now, and I want to say again that I thoroughly concur in this view. Maurice Greenbaum will be back next week, and I have the greatest possible confidence in his legal judgement. I believe she said also that your lawyer (the one who read the manuscript) would also have returned by that time.

For your own reassurance meanwhile, I can indicate the sources of the statements challenged. New Yorker p. 42, volatility of chlordane, etc. -- see Bibliog. p. 303, ref. to pp 23-24, Van Cottingen. Probably also the following reference to Hearings.

Second question on this page, Bib. p 304, first reference (Clinical Memoranda).

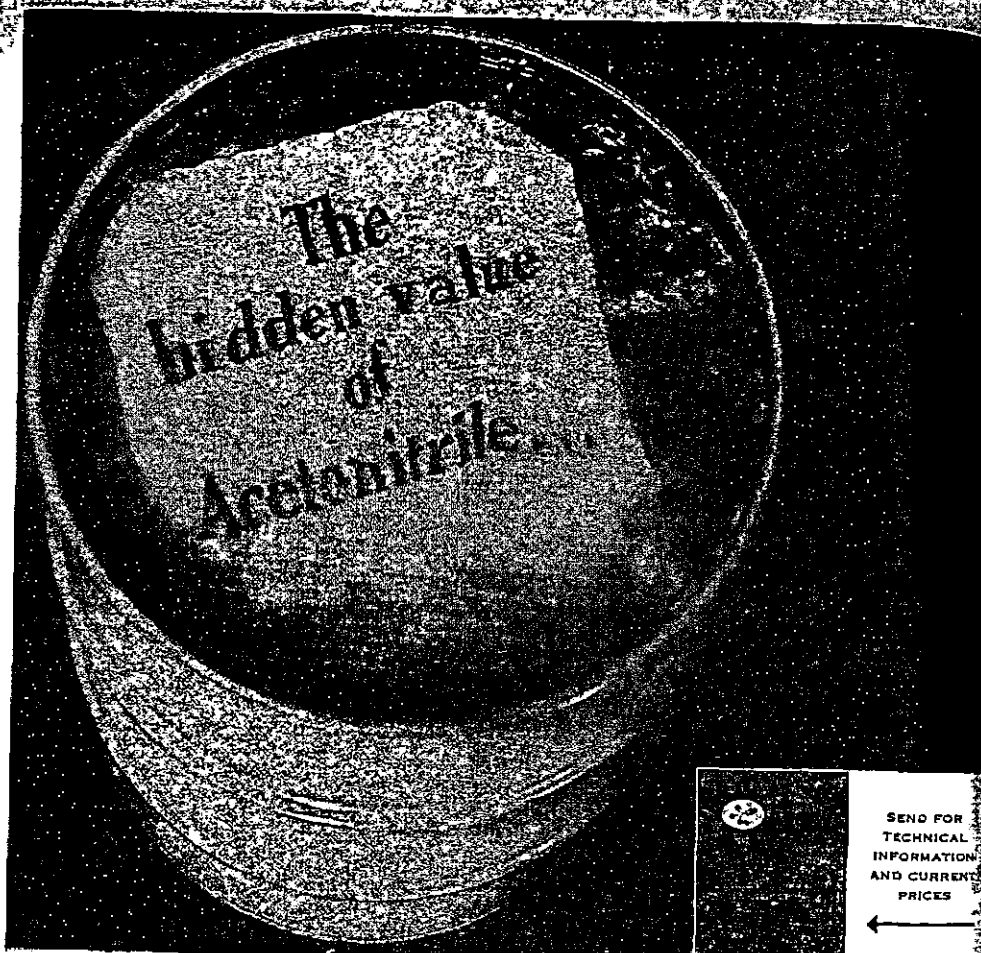
Toxicity of heptachlor epoxide to quail, data from Dr. James DeWitt, U.S. Fish and Wildlife.

N. Y. P. 88, see Bib p 311, ref to pp 80-61, Klostermeyer, etc. I am sure all the essential facts are there. However, I also had extensive correspondence with one of the companies (hop-growers) affected, and have a photo copy of a letter from Justice Ward, USDA, establishing the date on which Agriculture withdrew registration.

I don't think any of this should be given Valsicol now, and will ask you not to do so until Maurice approves. In haste,

Level -
F.Y.I
(I would be
point)
Paul

①
②
③
④



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EDITORIAL

II p 2136

Pesticides on Trial

Shortages of facts and excesses of emotion could deprive us of major benefits

Out of the atmosphere now developing about pesticides there may be little chance of evolving the optimum situation, or anything closely approaching it. Deadly poisons are in use as pesticides, it is true. But methods of controlling risk in their handling are known and are being improved. The present state is short of perfection, but work toward improvement goes on with vigor. Yet the emotional surge to be expected within a few months, pushed to new heights by the series, "Silent Spring," by Rachel Carson in the *New Yorker*, may put the best development of pesticides' usefulness nearly beyond our reach.

Favorable progress through the use of pesticides is easily documented. Known facts about unfavorable results from pesticides are limited, as is clear from Miss Carson's articles. Serious implications, in the absence of firm factual support, are flavored strongly with sensationalism.

Some wild animals are being killed. We place their value to humanity far below that of humans dying of starvation in areas where insects destroy crops that could keep them alive, or dying of disease where insects carry pathogens. The number of lives saved from destruction by malaria alone, through pesticial eradication of mosquitoes, is striking.

There can be no doubt that on the basis of factual evidence the balance of pesticides' contributions to humanity is heavily favorable. Carelessness and callousness that allow injury or harm are deplorable; strong measures should be taken against them. But such measures need not include outlawing the pesticides now occasionally misused. Control adequate for safe use is possible.

The potentially much more serious, long-term possibilities of damage from pesticides are not known. They are certainly a source of emotional as well as objective concern. Unless attention is given to them, the emotional is likely to outweigh the objective and perhaps prevent our ever establishing the facts.

Before this matter gets into the futile circus arena that can evolve in Congressional hearings, an appropriate branch of the Government, with full support from the pesticides industry, should set up an objective panel to evaluate the total available evidence. Where the evidence is clearly bad, it should be recognized, and corrective or preventive measures should be taken. Where it is clearly favorable, we should move for further progress as actively as possible.

A panel consisting of competent and respected individuals, including both scientists and non-scientists, all personally disinterested, should hear and weigh the evidence in this matter. To encourage frank discussion and prevent misuse of information presented, the hearings should be conducted in private. The panel should reach conclusions and make recommendations which would merit the highest public, governmental, and industrial respect. True progress in human welfare could be made upon such findings. In the emotional atmosphere now building, nothing constructive can be expected.

Richard L. Kernyon

to the problem of sharing our earth with other creatures there runs a constant theme, the awareness that we are dealing with life — with living populations and all their pressures and counterpressures, their surges and recessions. Only by taking account of such life forces and by cautiously seeking to guide them into channels favorable to ourselves can we hope to achieve a reasonable accommodation between the insect hordes and ourselves.

The current vogue for poisons has failed utterly to take into account these most fundamental considerations. As crude a weapon as the cave man's club, the chemical barrage has been hurled against the fabric of life — a fabric on the one hand delicate and destructible, on the other miraculously tough and resilient, and capable of striking back in unexpected ways. These extraordinary capacities of life have been ignored by the practitioners of chemical control who have brought to their task no "high-minded orientation," no humility before the vast forces with which they tamper.

The "control of nature" is a phrase conceived in arrogance, born of the Neanderthal age of biology and philosophy, when it was supposed that nature exists for the convenience of man. The concepts and practices of applied entomology for the most part date from that Stone Age of science. It is our alarming misfortune that so primitive a science has armed itself with the most modern and terrible weapons, and that in turning them against the insects it has also turned them against the earth.

Paul Brooks, The House of
Life: Rachel Carson at Work
 (Boston: Houghton Mifflin
 1972)

THE STORM

SILENT SPRING was serialized in *The New Yorker* beginning June 16, 1962, and instantly created a sensation throughout the country. The complete book was published on September 27. Perhaps not since the classic controversy over Charles Darwin's *The Origin of Species* just over a century earlier had a single book been more bitterly attacked by those who felt their interests threatened. Darwin's study challenged the entrenched power of the established church. By comparison, *Silent Spring* initially offended a relatively small (though very rich) segment of society, the chemical and other related industries (such as food-processing), and — in the federal government — the immensely powerful Department of Agriculture. But the fury with which it was attacked, the attempts to discredit that "hysterical woman" as she was called, have, I believe, deeper roots than a simple concern for profits or power on the part of special interest groups. Her opponents must have realized — as was indeed the case — that she was questioning not only the indiscriminate use of poisons but the basic irresponsibility of an industrialized, technological society toward the natural world. She refused to accept the premise that damage to nature was the inevitable cost of "progress." The facts she revealed were bad enough, but it was

the point of view behind them that was really dangerous, and must be suppressed.

The first attempt at suppression was made while *Silent Spring* was still at the printer's. Velsicol Corporation of Chicago claimed (on the basis of the *New Yorker* serialization) that an inaccurate statement had been made about one of their principal products, chlordane. They threatened suit if the text was published as it stood. However, when the publishers, convinced that the statement was correct, declined to change it, no more was heard of the matter.*

Though publication could not be stopped and the *New Yorker* serial extracts had already been the subject of over fifty newspaper editorials and some twenty columns, there remained the possibility of discrediting *Silent Spring* before it appeared in book form. Most of the individual companies left this task to the trade associations, such as the National Agricultural Chemicals Association, which took the lead by appropriating approximately a quarter of a million dollars "to improve the image of the industry." Its first effort was a publication entitled *Fact and Fancy*, which quoted from *Silent Spring* (without either credit or copyright permission) and supplied so-called "facts" to refute its statements. Monsanto Chemical Company, however, made its own unique contribution. Ignoring facts altogether, it ridiculed the book in a parody called *The Desolate Year*, depicting the horrors of a world without pesticides: something that Rachel Carson had specifically not recommended. "It is not my contention that chemical insecticides must never be used. I do contend that we have put poisonous and biologically potent chemicals indiscriminately into the hands of persons largely or wholly ignorant of their potentials for harm." (*Silent Spring*, page 12.)

* But more was heard about Velsicol. Just before she died, Rachel Carson learned that the enormous fish kills in the Mississippi, which had reached a climax in 1963, had been definitely traced by the Public Health Service to endrin, and specifically to the sewers of Memphis, where this poison — thirty times more deadly to fish than DDT — was found caked three feet thick. Since the only manufacturer of endrin in Memphis was Velsicol, their denials of responsibility were unconvincing.

The *New Yorker* series was barely on the newsstands before the trade journal *Chemical and Engineering News* launched a counterattack, without specifically referring to Rachel Carson. Under the headline "Pesticides Sales Pick Up" the editor wrote: "Federal-state spraying continues, but it has been hampered by the adverse publicity from conservationists who claim residues of the insecticide, dieldrin, kill birds and wild animals." The article quoted the director of New Jersey's Department of Agriculture, in connection with aerial spraying for gypsy moth control: "In any large scale pest control program in this area, we are immediately confronted with the objection of a vociferous, misinformed group of nature-balancing, organic-gardening, bird-loving, unreasonable citizenry that has not been convinced of the important place of agricultural chemicals in our economy."

Some of the least temperate reactions came from the agricultural journals and the state institutions whose agricultural research was heavily financed by the chemical industry. An editorial in the *American Agriculturist* presented a parody of the future in which a young boy and his grandfather "sat on opposite ends of a log in a forest clearing, cracking acorns and eating them greedily." Gramps explained that a book had come out called *Quiet Summer* expressing the views of "a number of people who believed that no chemical material should be used in agriculture . . . So now we live naturally. Your mother died naturally from malaria that mosquitoes gave her; your Dad passed away naturally in that terrible famine when the grasshoppers ate up everything; now we are starving naturally, because the blight killed those potatoes we planted last spring. I only wish the author of that book had stayed around to share the joys of living 'naturally' — but she made so much money as an author that she moved to a country where her book was banned. Farming there is still 'unnatural.' Please pass the acorns!"

Another magazine, *County Agent and Vo-Ag Teacher*, ran an article entitled, "How to Answer Rachel Carson." "We hope," wrote the editor, "you will use this information in talks before

groups on TV or radio, or in newspaper articles." The article refers the reader to "a kit of valuable information from the National Agricultural Chemicals Association" and "a devastating satire, written in the manner of Rachel Carson's book, describing a world in which no pesticides were allowed, titled *The Desolate Year*." On conclusion, it quotes the "chief horticulturist at Michigan State University" as saying: "Her book is more poisonous than the pesticides she condemns."

In short, the pesticide industry treated the challenge of *Silent Spring* as a problem in public relations, to be met by any means at hand. Yet not all the trade papers ignored the substance of the book while searching for clever ways to discredit it. For instance, *Agricultural Chemicals*, despite its orientation toward the industry, quoted Professor Moody Trevett of the University of Maine: "Miss Carson has posed some unanswerable questions as to what may happen to us in the next twenty years and this may be the time to sit down and do some serious thinking about the answers."

Of course, the organized opposition to *Silent Spring* was not confined to the chemical industry. Paradoxical as it might seem (since the problem of pesticides in prepared foods had been known for at least a decade), one of the most violent attacks came from the Nutrition Foundation, Inc., of New York City, which, in collaboration with the Manufacturing Chemists Association, reprinted and distributed a collection of the most unfavorable reviews. These included condemnations by Frederick T. Stare of the School of Public Health, Harvard University, and William J. Darby of Vanderbilt University. In the words of Paul Knight, a member of the staff of Secretary of the Interior Stewart L. Udall, who kept the Secretary informed on the continuing controversy over the book, they "reviewed *Silent Spring* in terms some of their fellow-chemists have characterized as polemical rather than scientific, prompting one nutritionist to remark that 'where the shot hit, the feathers fly.' This remark was made in reference to the fact that research on nutrition and processing in

many university laboratories is heavily supported by the food industry." In his review, Dr. Darby wrote: "This book should be ignored." Dr. Stare described it as "baloney."

The position of the American Medical Association in the controversy also seems surprising when one considers that some of Rachel Carson's strongest support came from specialists in public health, and that the largest number of letters she received, in cases where occupation was identifiable, were from physicians. Yet the *AMA News* for November 26, 1962, referred its readers to an "information kit," compiled by the National Agricultural Chemicals Association!

What of the popular press? On the whole, the reviews of *Silent Spring*, like the mail received by the author, were overwhelmingly favorable. There were, however, notable exceptions. *Time* magazine accused the author of trying to frighten the public by "using emotion-fanning words" and referred to her "oversimplifications and downright errors." Scientists, physicians and other technically informed people — according to *Time* — considered her case "unfair, one-sided, and hysterically overemphatic. Many of the scary generalizations — and there are lots of them — are patently unsound. 'It is not possible,' says Miss Carson, 'to add pesticides to water anywhere without threatening the purity of water everywhere.' It takes only a moment of reflection to show that this is nonsense." Today one may reflect for a moment on the fact that DDT is found hundreds of miles out to sea, even in the polar ice. The review concluded: "Many scientists sympathize with Miss Carson's love of wildlife, and even with her mystical attachment to the balance of nature. But they fear that her emotional and inaccurate outburst in *Silent Spring* may do harm by alarming the nontechnical public, while doing no good for the things that she loves." *

* On April 18, 1969, *Time* printed a photograph of Rachel Carson at the head of their new section entitled "The Environment." The accompanying article began as follows: "Pesticides such as DDT, parathion, aldrin and dieldrin are both ally and enemy to man. The chemicals annihilate predators: the aphids that plague

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- 231 Olga Owens Huckins, *Boston Herald*, January 29, 1958
 233 John Barkham, *Saturday Review Syndicate*, September 29, 1962
 233 RC to Olga Owens Huckins, October 3, 1962
 233 RC to DeWitt Wallace, *Reader's Digest*, February 1958
 234 RC to Marie Rodell, February 2, 1958
 235 Memorandum, A. A. Schaal and R. R. Bien to Herbert R. Mayes, *Good Housekeeping*, February 26, 1958
 235 *Silent Spring*, pp. 158-159
 236 RC to E. B. White, February 3, 1958
 237 E. B. White to RC, February 7, 1958
 237 RC to PB, February 21, 1958
 238 RC to Marjorie Spock, March 26, 1958
 238 Marjorie Spock and Mary Richards, "Portrait of Rachel" (unpublished)
 240 RC to PB, April 20, 1958
 240 C. J. Briejer, "The Growing Resistance of Insects to Insecticides," *Atlantic Naturalist*, July-September, 1958
 241 RC to PB, September 24, 1958
 241 RC to Edwin Way Teale, October 12, 1958
 241 RC to Marjorie Spock, November 6, 1958
 242 *Ibid.*, December 4, 1958
 242 RC to PB, February 14, 1959
 243 *Ibid.*

CHAPTER 17: MARSHALING THE EXPERTS

- 248 RC to Clarence Cottam, November 18, 1958
 249 Clarence Cottam to RC, November 21, 1958
 249 RC to Clarence Cottam, January 8, 1959
 250 *Ibid.*, October 30, 1959
 251 Clarence Cottam to RC, November 6, 1959
 252 RC to George J. Wallace, October 11, 1958
 253 Mrs. Eugene Meyer to RC, April 21, 1959
 254 M. M. Hargraves, M.D., to RC, April 30, 1958
 254 RC to Dr. Morton S. Biskind, December 3, 1959
 254 *Ibid.*, January 8, 1960
 255 *Silent Spring*, p. 225
 255 W. C. Hueper, M.D., to PB, June 18, 1969
 256 Robert A. Uihlein to F. L. Larkin, August 20, 1958

CHAPTER 18: THE END AND THE BEGINNING

- 257 RC to PB, June 3, 1959
 257 RC to Anne Ford, July 6, 1959
 257 *Ibid.*, August 7, 1959
 258 RC to PB, December 3, 1959

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- 258 RC to Marjorie Spock, December 30, 1959
 258 *Ibid.*, March 14, 1960
 259 *Ibid.*, June 19, 1959
 259 Mrs. Thomas Duff to PB, February 24, 1969
 260 RC to Dorothy Freeman, October 1959
 260 *Ibid.*, November 1959
 262 RC to PB, March 16, 1960
 263 RC to George C. Wallace, September 1, 1960
 263 RC to Mrs. F. L. Larkin, June 1, 1960
 263 RC to PB, September 27, 1960
 264 RC to C. Girard Davidson, June 8, 1960
 264 RC to Marie Rodell, April 23, 1959
 264 RC to Whitney Blake, February 17, 1960
 264 RC to Fon Boardman, March 14, 1961
 265 RC to PB, December 27, 1960
 266 RC to Marjorie Spock and Mary Richards, February 6, 1961
 266 RC to PB, March 1961
 266 RC to Dorothy Freeman, March 13, 1961
 268 RC to PB, June 26, 1961
 269 RC to Lois Crisler, August 19, 1961
 269 RC to Dorothy Freeman (?), September (?) 1961
 270 *Ibid.*, January 1962
 271 RC to Lois Crisler, January 23, 1962
 271 RC to Dorothy Freeman, January 23, 1962

CHAPTER 20: THE STORM

- 294n *New York Times*, January 16, 1965
 295 *Chemical and Engineering News*, July 2, 1962
 295 Gordon Conklin in *American Agriculturalist*, January 1963
 295 *County Agent and Vo-Ag Teacher*, November 1962
 296 Paul Knight, "A Case Study in Environmental Contamination" (unpublished)
 297 William J. Darby, M.D., in *Nutrition Reviews*, January 1963
 297 Frederick T. Stare, M.D., in *Chemical and Engineering News*, October 1962
 297 *Time*, September 28, 1962
 298 *Croplife*, February 1963
 299 Robert White-Stevens in "CBS Reports," "The Silent Spring of Rachel Carson," April 3, 1963
 299 RC to Dorothy Freeman, June 1962
 299 RC to Paul Knight, July 10, 1962
 299 Charles Simmons to RC, June 18, 1962
 300 RC, speech to the National Parks Association, October 2, 1962
 301 RC, speech to National Council of Women of the United States
 302 RC, speech to the Women's National Press Club, December 5, 1962

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NEWS

VOLUME 40, NUMBER 33

The Chemical World This Week

AUGUST 13, 1962

Industry Maps Defense to Pesticide Criticisms

Government also responds to charges against pesticides contained in Rachel Carson's New Yorker articles and forthcoming book

Moving gingerly, the pesticides industry is getting lined up to defend itself against the criticisms of Rachel Carson. Miss Carson's series of three articles, published in June in the *New Yorker*, is just a hint, the industry fears, of what is to come. Most industry men whom C&EN has talked feel Miss Carson presents facts accurately for the most part but comes to unwarranted conclusions from them and ignores the benefits of pesticides. Waiting for the other shoe to drop, the industry is now preparing for Miss Carson's book, "Silent Spring," which will be published Sept. 27 by Houghton-Mifflin.

Meanwhile, the Government is also concerned. In response, at least in part, to Miss Carson's articles, the Federal Council for Science and Technology has set up an *ad hoc* committee to review present government activities with respect to pesticides and other chemicals in the environment. The group will take advantage of work already done by federal agencies, cataloging existing research programs in the field, and pinpoint such gaps as may exist. Boisfeuillet Jones, special assistant for health and medical affairs to the Secretary of Health, Education, and Welfare, will head the committee. Mr.

Jones told C&EN last week that the membership of the committee has not been settled yet, but it will almost certainly include representatives from the Departments of Agriculture, Commerce, Defense, Interior, and HEW. He says all its members will be government personnel. Its report will be entirely for the use of the council. He hopes the committee can work fairly rapidly.

Mr. Jones says the Carson articles present "nothing new," that they are "highly dramatized presentations," but that they have aroused a great deal of public interest.

What She Says. In the *New Yorker* series, Miss Carson says that use of pesticides has killed or injured people, livestock and wildlife, as well as pests, is upsetting the balance of nature, and may be wrecking our "genetic heritage." She cites case after case of fish and bird kills following insecticide applications and cases of human deaths following use of pesticides. Her most scathing words are used against area-wide aerial spraying (which she terms "chemical rain," "chemical downpour," even "chemical fallout"). These campaigns have at times been not only harmful to wildlife, she says, but also



Rachel L. Carson
Her "Silent Spring" brings pesticide industry reply

Miss Carson's View of Pesticides and the Pesticides Industry

"My contention is not that moderate chemical controls should never be used under any circumstances but, rather, that we must reduce their use to a minimum and must as rapidly as possible develop and strengthen biological controls. I contend that we have put poisonous and biologically potent chemicals indiscriminately into the

hands of persons who are largely or wholly ignorant of the harm they can do. There is still a very limited awareness of the nature of the threat. This is an era of specialists, each of whom sees his own problem and is unaware of or indifferent to the larger frame into which it fits. It is also an era dominated by industry, in which the

right to make money, at whatever cost to others, is seldom challenged. We shall have no relief from this poisoning of the environment until our officials have the courage and integrity to declare that the public welfare is more important than dollars, and to enforce this point of view in the face of all pressures and all protests, even from

the public. On those occasions when the public is confronted with some obvious evidence of the damaging results of pesticide applications, has ventured to question the use of poisonous chemicals, it has been fed little tranquilizing pills of half truth. We ur-

gently need to put an end to these false assurances. It is the public that is being asked to assume the risks that the insect controllers calculate. The public must decide whether it wishes to continue on the present road, and it can do so only when it is in full pos-

session of the facts. In the French biologist Jean... The obligation to endure goes right to know."—Rachel Carson

Reprinted from *The New Yorker*, 30, 1962, by permission.

Scientists Take Issue with Miss Carson's Views

Dr. George C. Decker, entomologist, Illinois Natural History Survey:

"The 'Silent Spring' poses leading questions, on which neither the author nor the average reader is qualified to make decisions. I regard it as science fiction, to be read in the same way that the TV program 'Twilight Zone' is to be watched."

Dr. Edgar M. Adams, assistant director, biochemical research laboratories, Dow Chemical Co.

"Miss Carson has contrived what seems to be an accurate and full collection of every type of accident, misuse, question, and problem and presents them in a way to arouse concern and to create fears. The articles fail . . . to acknowledge

that people involved in research, in development, in the production and use of these substances are aware of the major she presents and are attempting to do something about the problems. . . . We are long past the point where such presentation can have constructive effects."

Dr. Arthur Rose, technical director, Applied Science Laboratories, Inc.:

"Chemists and the chemical industry should be outspoken in support of Rachel Carson's New Yorker criticisms in those cases where there has been an improper or dubious application of pesticides or herbicides. It is important that the industry develop a strong image of . . . opposing improper, unsafe, and questionable use."

ineffective against the pests they were meant to control. Pleading for a large-scale conversion to biological and other methods that would leave no residues on foods, she says: "As things stand now, we are little better off than guests of the Borgias." However, she claims that she is not against every use of pesticides (see quotation).

Trade Association Reaction. The National Agricultural Chemicals Association now has a position paper on the *New Yorker* articles and is making it available to anyone who asks for it. The Manufacturing Chemists' Association also has a policy statement (C&EN, Aug. 6, page 21). MCA's statement talks generally about chemicals and the environment, does not mention Miss Carson or her book specifically, although it does respond to some of her contentions.

However, MCA president John E. Hull says in a letter to member firms accompanying the statement that Miss Carson's articles, like many others before them, are a warning that thinking people are concerned about the misuse of chemicals and that for the most part they lack the information on which to base intelligent judgment. He believes the industry must bring the information to them as accurately, thoroughly, quickly, and objectively as possible. His group and NACA are now mapping plans to do so.

In general, the NACA statement makes these comments on the articles:

- They present one side of a very important subject.
- They present neither an accurate nor a complete idea of the importance of pesticide chemicals to the production of food and fiber or to the protection of public health.
- They allow readers to draw conclusions which are unwarranted in the light of scientific facts.

NACA's statement argues that two federal laws, the Miller Pesticides Amendment and the Federal Insecticide, Fungicide, and Rodenticide Act, provide adequate safeguards to the public health. It also recalls numerous investigations of the industry and the effects of its products by committees of Congress, the National Academy of Sciences, the U.S. Public Health Service, and governors' committees in many states. All of these, it says, concluded that pesticides must be used to produce food and fiber, that they must be and are being safety tested before use, and that they must be carefully and wisely applied.

NACA's new chief executive officer, Parke C. Brinkley, adds that "any harm that is caused by the use of pesticides is greatly overcompensated by the good they do." Formerly commissioner of agriculture for Virginia,

Mr. Brinkley took over at NACA on Aug. 1, succeeding L. S. Hitchner.

No Comment. Most producers of pesticides aren't commenting for publication about the Carson articles, preferring instead to let their trade associations carry the ball. The list of companies that refused C&EN's invitation to comment reads like a who's who for the pesticides industry.

Ten or 12 companies are preparing point-by-point rebuttals to the *New Yorker* series for their own use. They will take time, mean many man-hours of literature searching and writing.

Meanwhile, little has been heard in defense of pesticides from the government agencies which regulate the industry. The Department of Agriculture has made no official statement. Nor has the Food and Drug Administration. Unofficially, an FDA spokesman says the articles are obviously, perhaps also intentionally, one-sided. He says the cases Miss Carson cites are almost all cases of misuse, but he believes the articles could have a good effect, by warning of the dangers of misuse.

Delayed Response. Trade association statements lagged behind publication of the *New Yorker* series by a month or six weeks. Several reasons are behind the delay. One is a general feeling that it would be better to coordinate actions, to work as an in-

through the trade associations than to attempt a defense on a company-by-company basis. This time-consuming discussions, committee meetings, and circulating of statements to all concerned. In addition, industry has not been able to agree on whether or not to ignore attack. Many scientists and company officials feel that to engage in a public debate with Miss Carson may call even more attention to her points than they might otherwise give. Some also feel that Miss Carson's new book will not get the attention that her earlier book, "The Sea Around Us," received.

But there are others who feel she must be answered. Hobart O. Thomas of Stauffer Chemical, for one, says her articles "may mark the beginning of some serious problems for the chemical industry as well as the pesticides industry." He feels that if the public becomes frightened about its food supply and general health through "contamination" by chemicals, governments at all levels will push for unnecessarily increased regulation.

Large Audience. Those who say she must be answered point out that "The Sea Around Us," published in 1951, sold 2 million copies in the U.S., stayed on best seller lists for 86 straight weeks, has now been translated into 12 languages, was reissued as a paperback, and was even the title of a movie. Because that book earned so much praise for its scientific accuracy and fluent writing, they feel "Silent Spring" can be expected to command a large audience, and every major magazine and newspaper will feel compelled to review it. It's to be the October selection of the Book-of-the-Month Club. CBS is considering doing a special TV show on the topic sometime this fall.

Her agent, Mrs. Marie Rodell in New York, says that Miss Carson spent close to five years in the research and writing of "Silent Spring" and that the course of doing so she interviewed and corresponded with many industry and government officials and scientists.

The publisher says that 99% of the hundreds of letters coming in as a result of the *New Yorker* series are in favor of her viewpoint and 1% against. The *New Yorker* says its version, about half the book, was checked by many scientists and physicians before publication, including some in FDA, the Public Health Service, and the Department of Agriculture, but it would not name the individuals.

Stauffer, Avisco Agree To Acquisition Plan

Executives of Stauffer Chemical and American Viscose Corp. have worked out a \$175 million deal for Stauffer to buy Avisco's business. Excluded from the deal would be the 3.6 million shares of Monsanto common stock Avisco received in 1961 for its half interest in Chemstrand Corp. The acquisition must still be formally approved by directors and stockholders of both Stauffer and Avisco.

If approved, the deal would catapult Stauffer into the synthetic fiber field. And it would result in a company with total assets of about \$500 million, sales of about the same amount, and earnings of about \$25 to \$30 million. Last year, Stauffer netted \$17.4 million on sales of \$225.8 million; Avisco earned \$6.5 million (exclusive of Monsanto dividends) on sales of \$219.0 million. During the first half of this year, Stauffer's sales were up 2% from a year ago to \$121.0 million and its profits were 8% higher at \$10.2 million; Avisco's sales climbed 18% to \$119.4 million, while net operating income rose more than 200% to \$5.5 million.

No Surprise. The proposal comes as no surprise. Avisco has been talking merger with a number of companies in recent months, including Allied Chemical, FMC Corp., and Britain's Courtaulds, as well as with Stauffer (C&EN, July 30, page 29). But both Avisco and Stauffer had said earlier that nothing had come from their discussions.

Stauffer plans to issue 3,451,000 shares of its common stock, worth about \$110 million at present, and \$66 million worth of debentures for Avisco's assets. The offer is subject to adjustment for any cash retained by Avisco and to balance sheet adjustments at the date of acquisition.

In acquiring Avisco, Stauffer would get the largest U.S. rayon producer, second largest cellophane maker, and an important producer of cellulose acetate yarn. Avisco also recently started commercial production of Avicel, a microcrystalline cellulose for use in low-calorie foods.

Stauffer also would pick up a couple more joint ventures to add to its stable: Avisco's half interest in Ketchikan Pulp and its half interest in Avisun, producer of polypropylene resins and packaging film.

Stauffer has not said what it plans for the textile business. If the deal goes through, and Avisco retains its identity, it will essentially become a holding company owning Monsanto and Stauffer stock.

Avisco has been trying for some time to find a way to distribute its Monsanto stock to its stockholders (C&EN, May 14, page 19). But it has wanted to work out a way whereby the stockholders would be taxed on capital gains rather than ordinary dividend income. Acquisition of its operating assets by Stauffer could provide such a way. Avisco's Monsanto stock has a book value of \$78 million, but its present market value is about \$140 million.

Texas Grand Jury Indicts Maynard Wheeler

"I have never conspired with anyone to fix prices or to control markets." So said Maynard C. Wheeler, president of Commercial Solvents, following his indictment by a grand jury of Potter County (Amarillo), Tex., Aug. 3. Indicted with Mr. Wheeler was Billie Sol Estes. Mr. Estes' trial has been set for Oct. 29, but at press time no date had been set for Mr. Wheeler's trial.

The two men are charged with conspiracy to fix the price of ammonia in Potter County and with acting in restraint of trade by allegedly attempting to sell ammonia at low prices to reduce competition. These are criminal charges, as contrasted with the civil charges filed earlier in the Estes affair by Texas attorney general Will Wilson (C&EN, May 28, page 29).

In Texas, conviction on criminal charges of antitrust violations is punishable by imprisonment for from two to 10 years.

Commenting on the charges, Mr. Wheeler says, "The accusations against me apparently are based on testimony given at the so-called courts of inquiry in Texas, at which the attorney general selected the evidence which was introduced and we were not permitted to cross-examine the witnesses or to submit rebuttal evidence in our behalf. We will await disposition of these charges under proper judicial supervision, where we will be offered a fair opportunity to defend our reputation against these unwarranted attacks."

though many schools at present cannot afford transportation costs for their pupils, a few near the park have been able to do so. Interest in wildlife so engendered, however, is not long lasting, as pupils by and large have little enthusiasm for topics not directly leading to school certificate examination.

Because conservation is built upon a science of ecology, it is evident that a widespread general understanding among Ugandans of some basic principles of synecology is necessary if sound public policy with regard to wildlife resources is to have popular support. Further, much research needs to be undertaken in wildlife biology, and unless greater interest in wildlife is stimulated in secondary schools, it is going to be a low-prestige field. The implica-

tions for such a status for the future of conservation and its contribution to the economy of Uganda are obvious, and should not be overlooked by those responsible for the planning of curricula in Uganda.

Literature Cited

- Bere, R. M., 1962. *The Wild Mammals of Uganda*. Longmans Green & Co., Ltd., London, pp. 25-27; 75; 76.
- Grzimek, Bernhard. 1957. *No Room for Wild Animals*, trans. by R. H. Stevens, W. W. Norton & Co., New York, pp. 102-104.
- Huxley, Julian S. 1961. *The Conservation of Wild Life and Natural Habitats in Central and East Africa*. UNESCO, Paris, pp. 15; 109.
- International Bank for Reconstruction and Development. 1961. *The Economic*

Development of Uganda. Govt. Printer, Entebbe, p. 236.

- Mathews, D. O. 1962. *Some Economic Aspects of National Parks and Reserves in Relation to Tourism*. Panel Paper Section 2(b), First World Conf. on National Parks. International Union for Conservation of Nature and Natural Resources, Seattle, pp. 2; 4; 6-7.
- Moorehead, Alan. 1957. *No Room in the Ark*. Harper & Bros., New York, pp. 111-112.
- Petrides, George A., and Wendell G. Swank. 1958. Management of the Big Game Resource in Uganda, East Africa. *Trans. 23rd North American Wildlife Conf.* Wildlife Management. Inst. Washington, pp. 461-477.
- Trimmer, Col. C. D. 1962. Personal conversation.
- Uganda Game and Fisheries Dept. (Game Section). 1960. *Report for 1 July 1958-30 June 1960*. Govt. Printer, Entebbe.

XI International Botanical Congress Proposed Commemorative Stamps

The XI International Botanical Congress will meet at the University of Washington, in Seattle, August 24 - September 2, 1969. It will be the second time that the Congress has been held in this country; the first was held at Cornell University in 1926. To commemorate the occasion, it has been recommended that this country issues in full color, with accuracy and beauty, a selection of flower stamps to which all may point with pride.

Five stamp designs are proposed—one chosen as typical for each quadrant of the country plus a fifth depicting the Seal of the Congress.

Among other requirements, the Post Office Department strives to honor proposals that represent the greatest segment of our population. Hence, strong public endorsement is essential to success.

Persons and organizations interested in giving support to this endeavor are invited to contact Dr. William L. Stern, Chairman, Commemorative Stamp Committee, XI International Botanical Congress, Department of Botany, University of Maryland, College Park, Maryland 20740.

The examples selected for the four quadrants are:

XIth INTERNATIONAL



Northeastern United States The showy ladyslipper (*Cypripedium reginae*) is a well-known orchid, native of woodland bogs.

XIth INTERNATIONAL



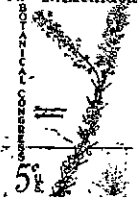
Southeastern United States The Franklinitia Tree (*Franklinitia atlantica*), discovered by Bartram in western Georgia, named for Franklin, and although now lost as a member of our native flora, is widely cultivated for its showy flowers.

XIth INTERNATIONAL



Northwestern United States The Douglas Fir (*Pseudotsuga menziesii*), perhaps the best known and most important timber tree in America, and while not important for its flowers, is distinguished by its unusual cones.

XIth INTERNATIONAL



Southwestern United States The Ocotillo, known also as Coachwhip and Vine-Cactus (*Fouquieria splendens*), is a showy desert shrub with scarlet flowers borne in great profusion.

Pesticides and the Environment

Louis A. McLean
Velsicol Chemical Corporation

Foreword

If history has taught us but one thing, it is this: no discussion of the environment is meaningful if it is limited to the tangible environment. The extremist Nazi theories of heredity that denied rights to non-Aryans and the extremist views of environment of Marx and Lenin that similarly denied rights to classes of people and degraded scientific thought, as typified by the teachings of Lyenko, both were implemented by creating an intangible environment of fear and propaganda. The crescendo of controversy over pesticides a few years ago also polluted the intangible environment with long-range, adverse effects.

On January 31 I spoke on this point at a meeting of the South Eastern Branch of the Entomological Society of America, before I had the opportunity to read Dr. Goodwin's paper published in the March issue of BioScience. I share Dr. Goodwin's concern for pollution of the tangible environment and agree with him that the heat of the controversy concerning pesticides a few years ago made frank discussion difficult. I differ with Dr. Goodwin, however, in his suggestion that the controversy served an overall useful purpose. In my January paper, which follows, I noted some of the continuing adverse effects of that controversy, which I hope will be of interest to the readers of BioScience.

I submit that the campaign of false fear against the use of modern pesticides has, is, and will cause deaths and sufferings greater than those of World War II. It has been over 12 years since a major new insecticide has been brought to market and this is due to unnecessary controversy. During this interim, daily deaths due to starvation and malnutrition have risen from 6000-7000 per day to over 12,000 per day, not to mention the millions who have died from vector-borne diseases. These lives could have been saved had the efforts devoted to controversy been used to encourage the discovery and wider use of insect controls. Each person who has played a part in the campaign of

fear must accept responsibility for his share of the unnecessary toll of human life, a toll that will continue and will increase because we are still handicapped by an environment polluted by that false campaign.

Now, for the moment, let us concern ourselves with contaminants of the physical environment, in the air, food, water, and soil. Nature is the prime polluter. Next, we, the public, pollute, with industry, then farming, well down the list. I do not propose that efforts to remedy follow order of importance. We should improve as we can. I do propose, however, that major factors be given major effort and that it is wrong to misdirect major effort to be insignificant.

Air Contaminants

The primary contaminants of the atmosphere are natural substances such as dusts, pollen, viruses, and bacteria. Went has stated that the volume of terpenes and esters released by pines and other trees and shrubs pollutes the atmosphere 1000% more than all man's fires, factories, and vehicles. The atmosphere also is the transportation medium of insect and bird-borne diseases.

After nature, man's daily living puts the second greatest burden on the atmosphere. For example, although the situation has vastly improved with changes in fuels and better furnaces and boilers (witness Pittsburgh), it was recently estimated that the automobile

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created an annual burden of 182½ billion pounds of carbon monoxide, a Class I toxicant. This does not include the even greater burden coming from furnaces, boilers, and other combustion devices. Compare this to approximately 700 million pounds of pesticides used annually, only a small fraction of which consists of Class I materials and only a minute fraction of that becoming available as atmospheric burden.

Traces of DDT appearing in atmospheric dusts have been overemphasized. A pound of DDT per acre is 3 ppm in the top inch of soil. The threshold value for DDT, the level at which a man may safely work, is 1 ppm. By simple mathematics, it is obvious it would be necessary for a man to breathe an impossible concentration of over ¼ solid earth before this safe level would be exceeded.

Food Contaminants

The primary contaminants of food are natural filths and disease organisms: salmonella, botulism, ergot, molds and fungi, toxins, and mycotoxins. The most common form of food poisoning is spread by rodent feces. Modern pesticides, in reducing insect and rodent contamination, made possible a purity standard for wheat, which became effective July 1, 1956, but which still permits 10,000 ppm insect damaged grain and approximately 160 ppm rodent pellets.

The FDA Market Basket studies prove that pesticides in our food are far below the level necessary for safety. The Human Fat studies prove that pesticides are not building up in the populace. Your food may be contaminated, however, if the bus boy fails to wash his hands, if the waitress sneezes on your plate, or if the restaurateur fails to control rodents and roaches in his cafe.

Far too many Americans have been convinced of special value in foods produced without the aid of agricultural chemicals. One publisher of such dogma boasts a monthly circulation of over 700,000 copies. For the benefit of those who do not appreciate the truth of the maxim of Paracelsus, "the dose solely makes the poison," it should be emphasized that foods grown without modern aids naturally contain toxic materials in harmless, negligible quantities, just as foods grown with modern

aids may contain harmless, negligible quantities of the same or other materials. I am not speaking of the fact that honey may be dangerous because the bee has fed on the azalea or lime flowers. I am not speaking of the fact that smoked or barbecued foods contain carcinogens, although one researcher has estimated that the carcinogens in a barbecued steak are equal to those gained from smoking 700 cigarettes.

Emphasis is given to the fact that foods grown with or without modern aids contain harmless quantities of materials, some necessary for good body function, but, nevertheless, materials harmful if overdosed. Before giving a partial list, may I make it extremely clear I am not suggesting that any of the foods listed are harmful if eaten in normal amounts. It is true, however, that the apple of day that keeps the doctor away contains mercury which we do not permit man to add to food. Crops grown in many areas contain arsenic, bromine, selenium, and fluorine. It is interesting to note, however, that fluorine, toxic if overdosed, is not only beneficial to the teeth and bones, but a study reported in last October 31st's issue of *JAMA* notes that those residing in high fluoride areas show significantly lower calcification of the aorta (Bernstein, et al., 1966). The following foods, regardless of how clean and primitively cultured, contain known toxic materials: cabbage and vegetables of the brassica family, spinach, rhubarb, soya beans, cotton seed, lathyrus beans, cassava, cereals, potatoes, beets, fruits, peanuts, callabash, tomatoes, oranges, rutabaga, turnips, salt, lactose, nutmeg, eggs, and any food containing Vitamins A, D, cobalt, riboflavin, folic acid, and Vitamin K. The latter recently has been noted as an effective insecticide for the control of carpet beetles. (For a description of the toxic action of materials involved in the majority of the items listed, see Durham, 1963; also, Spaulding, 1966.)

In short, Paracelsus was right and food faddists are wrong.

Water Contaminants

The primary contaminants of water are natural. They include such things as silt and the Red Tide. The latter alone kills more fish than all man-

generated wastes combined. They include toxins of algae and disease organisms, such as botulism and the disease known as Western Duck Disease. The record shows that the latter has killed countless numbers of waterfowl periodically for over 100 years. The botulism kill of waterfowl in Manitoba is estimated as equal to 50% of the legal harvest. Yet far too little is being done to study and control these ailments of fish and birds.

Sewage contamination of water is second to nature's contamination. There is no point in condemning grandfather because he did not provide separate storm and sanitary sewers, nor foresee the future possibility of plants for sewage disposal, nor anticipate that the growth of the nation would make past practices obsolete. He had his hands full providing a base on which future generations could build. The enormity of the sewage problem, however, is illustrated by the fact that the estimate for merely separating storm and sanitary sewers, without one cent for disposal plants, is \$30 billion, 15 times the estimate for the most expensive type of new Panama Canal.

To further illustrate, the Ohio River Valley Sanitation Commission last year released figures demonstrating the progress made in its eight-state area to correct the sewage problem and what is being accomplished to treat industrial wastes. Sewage was being acceptably treated in only 68.5% of the communities. Treatment facilities were acceptable in 84.2% of the industries. Of the municipalities, 19.3% did not have disposal facilities in construction. Only 0.7% of the industries had no facilities programed.

Soil Contaminants

The primary contaminants of soil are natural. The soil teems with nematodes, larvae, bacteria, viruses, and numerous toxins. It contains metallic poisons, while usually in harmless amounts, nevertheless placing in dusts and foods quantities of these elements exceeding the limits permitted for pesticide residues.

Considering every aspect of the physical environment—the air we breathe, the water we drink, the food we eat, and the soil—we learn that we should first be concerned with nat-

ural contaminants. If we stop to reflect, we note that man's progress has always been based on overcoming natural factors, and using and bending those factors to his benefit. This will continue to be true for generations to come.

Importance of Natural Contaminants

It is not wrong to urge a reduction of man's insults on the environment. Certainly accomplishments will continue to be made in this area before we eliminate all of nature's insults. It is wrong, however, to pretend that natural contaminants are not of prime importance demanding prime corrective action. It is wrong to beat the "work horse" pesticides time and again with heavy clubs of accusation, to strike with a new club as each old club breaks of false grain and overstrain.

Some years ago Marie Curie stated, "Nothing in life is to be feared, it is only to be understood." The truth of her words is now being demonstrated. You will recall the many efforts of recent years to discredit all those who spoke of the necessity, value, and safety of pesticides. Such accusations were typified in a speech of the late Miss Carson made to the Women's National Press Club in December, 1962. In the colorful language with which she was gifted, she stated that scientific information here was screened to serve the "gods of profit and production." She accused the medical profession, control officials, and the scientists of our colleges and universities of having been purchased by industry. Such efforts to discredit all informed research were not without effect. Millions of dollars were appropriated and studies thrust upon many inexperienced in residue detection. Some of those studies were designed to gain additional and useful information, but many were designed to duplicate studies already performed by qualified researchers. The poison had been injected into the intangible environment—that experienced men of medicine and science could not be trusted. But, as Marie Curie could have predicted, as men of other specialties gained knowledge, they would have less fear of pesticides in the physical environment.

I remember a conversation of a few years ago with a good friend of mine, a sanitary engineer, who shortly before

had become interested in pesticides as pollutants. Knowing he had been accustomed to thinking in terms of ton-loads of solids and tens of thousands of coliform bacteria in water and was about to face the problem of measuring pesticides in parts per billion, I said that he would soon recognize the prime importance of natural pollutants and the secondary importance of the wastes that we, the people, create by our daily living, and the relative insignificance of pesticide contamination. He asked me, with some amusement, if I were attempting to drag a "red herring" across his path of inquiry. I responded that the herring was not red and it was not a herring, it was a whale.

A few months ago I had occasion to speak with him again. He said he had learned to appreciate what I meant. He said the thing that finally brought home to him the true meaning of parts per billion was an announcement that the Federal budget for 1967 was then estimated at approximately \$125 billion. He said it suddenly dawned on him that if he were a Congressman or Senator and had been responsible for reducing the budget by a part per billion—\$125 saved by laying off one secretary for one week—he doubted that his efforts would gain him much public acclaim.

Pesticides Not Significant Pollutants

Numerous studies have been released in the past 12 months verifying the fact that pesticides are not significant pollutants in the physical environment. I am certain you are familiar with the studies released by USDA negating the accusation that continued use of insecticides had caused them to build to high levels in the soil. Many water monitoring studies indicate no significant presence. Such studies as that of Luckmann (Luckmann, et al., 1966) in emphasizing the lack of presence of pesticides in 20 major watersheds in Illinois "using specially designed equipment that can detect one-billionth of a gram" further confirm this.

The one-two importance of nature, then citizen activity, is recognized with greater frequency. Last September 18, for example, the Chairman of the Chicago Plan Commission noted that only about 10% of the dustfall in Chicago could be traced to industry; the balance came from windblown dust, traffic,

open fires, rubbish, and poor fuel and home heating plants.

Ribicoff Report

There is a happy similarity between the words of Marie Curie and a statement appearing in the final Report on Pesticides of the Senate Committee on Government Operations (the Ribicoff Committee).

You will recall a few years ago those hearings provided a forum whereby many with variant and anti-pesticide views gained nationwide publicity. Their predictions of coming disaster engendered unnecessary fears in the minds of many. The calm, sage advice of informed experts, appearing at the same forum, largely went unheralded. It is noteworthy, therefore, that the Report, in commenting on the benefit-risk equation, observed that the quantity and quality of information available to scientists and administrators in government, academic institutions, and private industry was "far more extensive than was generally recognized. Thus, predictions of impending disaster aroused great anxiety, not because there was insufficient evidence available to challenge these prophecies, but because the public was simply not sufficiently aware of the existence of this information."

In short, the Report concluded that all the furor of 3 years ago was unnecessary. The fears implanted in the minds of many were unfounded. Regrettably, fears implanted in the mind are not easily erased by a report, even if the report were to be given the publicity of the original false accusations. And fears and concern, even if unfounded, remain damaging to the health and well-being of those obsessed with fear.

Unfortunately, those purposeful and compulsive anti-chemical critics, who, by tongue and pen, spread the poison of false fear prior to, during, and since those Senate hearings will not be quieted by the Committee's conclusions that the anxieties they raised were unnecessary and were based on the ignorance of those making the false accusations.

Two Types of Critics

Long ago it became apparent that the pesticide controversy was led by two types of critics—purposeful and compulsive. The purposeful include

those who use the controversy to sell natural foods at unnatural prices, to give color to their books, writings, and statements, to gain notoriety, or in any way to profit from the controversy. The compulsive were described by Sigmund Freud in *Totem and Taboo* as neurotics, driven by primitive, subconscious fears to the point that they see more reality in what they imagine than in fact. If you read medical journals (Stare, 1966; Bernard, 1965; Marmor et al., 1960), you will learn that the same purposeful and compulsive types, the anti-pesticide people, in almost every instance hold numerous beliefs in nutritional quackery and medical health programs. The compulsive see simplicity as purity, feel rejected by mankind and man-endorsers such as science, medicine, and business. They are not able to adjust to the assaults on the ultimate socially or in business, and especially the ego-shattering fact that we all grow older. Thus while they seek youth and purity in the simple and primitive, they suffer increasing fear of loss of health and physical powers. While presenting a holier-than-thou attitude, they are actually preoccupied with the subject of sexual potency to such an extent that sex is never a subject of jest.

The anti-pesticide leader, as distinguished from the fair-minded person who is merely misinformed about pesticides, can almost always be identified by the numerous variant views he holds about regular foods, chlorination and fluoridation of water, vaccination, public health programs, animal experiments, food additives, medicine, science, and the business community, or by his insistence that insecticides should be mislabeled "biocides."

I have taken advantage of other forums to urge the chemical industry, its associations, and the chemical trade publications to list, below the names of anti-pesticide leaders, the number of other variant views they have expressed. I hope such a listing will become available and will be furnished to you, so that you may aid in letting the public know the total thinking of those who guide anti-pesticide criticism.

It is important for all to understand the total thinking of this group, the fact that compulsive critics inherently are

crusaders against man-endorsers. They will continue attempts to create issues, hearings, inquiries, and lawsuits as long as they can gain attention. Through their publications, through their associations, they currently campaign against public spraying and public health programs. They offer propaganda kits, how to organize protest against fluoridation, against public health programs, against public spray programs. They offer to supply affidavits of "experts" outside their field of expertise. They urge court action to enjoin such programs, authorized by knowledgeable experts and authorities, who may be judged into issuing an injunction. Judges cannot take the time to hold hearings, comparable to those of the Senate Committee, to also conclude that the "predictions of impending disaster" are based on ignorance. The leaders of the anti-chemical cult have attempted to subvert the good purposes of legitimate wildlife organizations, unmindful of the loss of privilege those organizations might suffer if led into activities to foment litigation — activities dangerously like those common law offenses termed *malum in se*, barratry, champerty, and maintenance.

The total thinking of the leaders of the anti-chemical cult is anti-social, whether they consciously recognize it or not. Nowhere is this better illustrated than in their opposition to public spraying and to public health programs. Obviously, opposition to mosquito control during an encephalitis epidemic does not show a true concern for man. The anti-social purpose, however, is rarely confessed. Quite to the contrary, those who obstruct public spraying argue that the authorities and the medical men do not know what they are doing and the argument is always made that there is a danger to wildlife that should be prevented at all costs. The problem, therefore, is not one simply of explaining the benefits of pesticides and chemicals generally to man's health and to production of man's food. The problem is to keep the public informed also of modern agriculture's benefits to wildlife, including its chemical tools, and to let the public know that the farmers' chemical tools are seldom misused and the benefits to wildlife have far outweighed the few unfortunate misuses.

Campaign of Fear

Earlier I stated, "each person who has played a part in the campaign of fear must accept responsibility for his share of the unnecessary toll of human life, a toll that will continue and will increase because we are still handicapped by an environment polluted by words unduly harsh, the predictions, alarmist, but the fact is opposite. Twelve thousand people per day dying of starvation and malnutrition is over four million human lives each year. And there is no possibility of stopping a progression of this figure in less than 10 years after first-line efforts are made to increase food production throughout the world and here at home. To this progressive figure must be added the millions who will die from vector-borne diseases because of failure to develop new controls and utilize existing controls. Each individual who has fostered the campaign of false fear must recognize his responsibility for creating an intangible environment, or a political environment if you prefer that term, which has delayed realistic action by authorities and the development and full use of new pesticides and those on hand.

We all know that modern insecticides have been and are the key to increased crop yields. Without the crop insurance they provide, fertilizers, better varieties, and other investments to increase yields cannot be hazardous. Had it not been for the practical doubling of our per-acre yields since the advent of modern pesticides, we would have long since been hungry and would have paid exorbitant prices for the poor diet. A constant theme of the anti-pesticide campaign, however, has been that we are a nation of unending surplus — that if the bugs ate half the crop, the nation would be benefited. Only a month or so ago, one of the natural foods publications remarked that our trouble was that we grow too much, store too much, and give away too much. Now, it is not difficult to criticize past administration of aid programs, but morality and our self-interest demands that we do everything reasonably possible to aid the hungry to provide for themselves; and to gain a degree of health and well-being so that they may have the will and ability for self-defense.

It has long been obvious to those who made inquiry that the surplus here would end and that it never existed on a world basis. It is to be regretted that the more realistic approach to food aid adopted at the last session of Congress is all likelihood will not be implemented by the funds provided. Our year-age daughters spend approximately one-fifth of this amount on beauty aids. We have delayed too long in realistically providing incentives to our farmers, and we have added unnecessarily to their costs by unrealistic restrictions on their uses of modern pesticides. This is true despite the fact that for two decades there was not one instance of illness resulting from permitted uses of pesticides, including those later restricted. It is officially recognized that although over half of the 60 million acres removed from production by reason of our increased yields have recently been authorized for production this year, much of that land will not be so used because incentives are not there. The incentives are not there because of the intangible environment created by the false propaganda of per-petal surplus.

You, who are a part of the academic world, see another result of the campaign against the farmer, his chemical We, who have special knowledge of the

tools, and the agriculture-connected sciences. Efforts to paint the farmer as a wanton rube have poisoned the minds of many urban people and their children. Despite the increase in urban populations, urban candidates for study in the agricultural sciences diminish. It is no wonder, when such a student is told (as one I know was told) that the only respectable job for an entomologist is in a museum classifying insects. What has the world lost in genius and discovery this past decade because impressionable youth has been discouraged from entering the agriculture-connected sciences?

The food crisis is the greatest material problem mankind has ever faced. It follows that every person who has worked to pollute the intangible environment, which pollution has increased and prolonged this problem, has incurred a crushing responsibility. Every moral person bears an obligation to foster efforts to alleviate hunger not only in India but also in friendly nations of this hemisphere. All freedom-loving people have a self-interest and a lower tax interest in directing aid so that hungry peoples may provide food and health for themselves to gain the will to defend personal freedoms.

We, who have special knowledge of the

need for every type of insect control as the key to increased food production, have a special obligation to urge and demand the fullest realistic employment of all insect controls, as well as the use of other pesticides, fertilizers, and development of better seed. Each of us has an obligation to speak out, to do something to cleanse the intangible environment of its pollution. This is the starting place.

References

Bernard, V. W. 1965. Why people become the victims of medical quackery. *Am. J. Public Health*, 55: 1142-1147.
Bernstein, D. S., N. Sadowsky, D. M. Hegsted, C. D. Guri, and F. J. Stare. 1966. Prevalence of osteoporosis in high- and low-fluoride areas in North Dakota. *J. Am. Med. Assoc.*, 198: 499-504.
Durham, W. J. 1963. Pesticide residues in foods in relation to human health. *Residue Rev.*, 4: 63-66.
Luckmann, W. H., and E. Press. 1966. Tap water. *III. Nat. Hist. Surv. Rept.* No. 48, Oct., 1966.
Marmor, I., V. W. Bernard, and P. Ottenberg. 1960. Psychodynamics of group opposition to health programs. *Am. J. Orthopsychiatry*, 30: 310-342.
Spaulding, R. C. 1966. Toxic hazards associated with food. *Roy. Soc. Health J.*, 86: 131-135.
Stare, F. J. 1966. Nutritional quackery. *The New Physician*, June, 1966.

In Brief

pen—too dark? Wipe with a moistened swab. Using a light behind the slide while coloring will be helpful in your preparation. Finish the slide by mounting between glass plates.
I can hear most of you researchers right now. "Gaudy!" "Oscenations!" The first time you use these slides should correct your dubious feelings. The initial reaction from the audience will tell you that you kept their attention and got your everything from quiet murmurs to gasps, and I'm not exaggerating one iota. Increased discussion will let you know that you kept their attention and got your point(s) across. Questions on how you prepared your slides will be the final evidence in support of adequate slide preparation.

A few minutes and a few pennies will enhance your presentation markedly. Why not give it a try?

Colored Lantern Slides

Jessup M. Shively, University of Nebraska

Papers at local, regional, and national meetings are a major conveyance of scientific information. The slides that accompany these presentations are often inadequate. The slide problem was recently discussed by O. W. Richards in *BioScience* (Dec. 1966).

The two principal faults of scientific slides are insufficient size and overcomplexity. Size shouldn't create problems. Simply make all of the components of the drawing for the slide larger. Richards gives good size guidelines. Complex (considerable quantities of different information) slides are often necessary to convey the desired amount of information in the short time period normally allowed for papers. Lack of clarity often results. Each slide should be kept as simple as possible, but if you do have a complex slide, it is important to indicate or mark the different ideas or information in some way.

Color can be used effectively in this capacity. One color can be used to stress the major point(s) of your slide, or several colors will differentiate between several types or kinds of data on the same slide. In addition, vivid colors will attract attention.

The procedure that I use for preparing colored slides is inexpensive and takes very little additional slide preparation time. Prepare your drawing (large enough?) in the conventional manner (lettering set or tape method advised)—typing is generally not adequate. Prepare or have prepared a 3/4 x 4 inch copy-negative (high contrast process film) of your drawing. Using felt-marker pens (water soluble dyes), color in the desired clear areas (gel slide). Color density may give you a problem at first. Check in a projector by taping temporarily between glass plates — too light? Go over again with the

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July 02 1962



VELSICOL CHEMICAL CORPORATION

330 East Grand Avenue / Chicago-11, Illinois / U.S.A.

August 2, 1962

Houghton-Mifflin Company
2 Park Street
Boston 7, Massachusetts

Attention: Mr. William S. Spaulding,
President

Gentlemen:

We are advised you intend to publish a book authored by Rachel Carson, substantially following the statements of three articles, which recently appeared in "The New Yorker" magazine, entitled, "Silent Spring".

We wish to call several matters to your attention from legal and ethical standpoints.

From a legal standpoint, we call to your attention the fact that several of the chemicals named, including, for example, aldrin, chlordane, dieldrin, endrin, and heptachlor, are patented chemicals. Chlordane and heptachlor are manufactured solely by this company. You no doubt are familiar with the fact that disparagement of products manufactured solely by one company creates actionable rights in the sole manufacturer. Misstatements, stated as fact, and not as opinion, regarding chlordane and heptachlor appeared in the articles which ran in "The New Yorker". By way of illustration, but not as a substantial enumeration, your attention is called to the following misstatements: At page 42 of the June 16, 1962, issue of "The New Yorker", it is stated that chlordane is "quite volatile" and that "poisoning by inhalation is a definite risk to anyone handling it". Without going into an explanation of the laws of physical chemistry, we call your attention to the fact that it is officially recognized that the air will not sustain sufficient vapors of chlordane to reach a threshold limit.

On the same page, reference is made to a man who accidentally spilled a "25% solution of chlordane" on his skin and died within forty minutes. The solution involved in that unfortunate industrial accident many years ago contained an additional active ingredient in greater percentage.

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On the same page it is stated that laboratory tests on quail showed that heptachlor epoxide is from two to four times as toxic as heptachlor. Unless the author's source for this statement is other than we expect, she has confused feeding tests of heptachlor on one hand and tissue analyses run for epoxide on the other. As a practical matter, however, fully scientific tests show the relative toxicity of heptachlor and heptachlor epoxide as substantially the same.

At page 86 of the same issue the author has accepted as fact the allegations of plaintiffs in litigation as to the "advice" of insecticide manufacturers and "damage" to hops, which allegations have been denied and are unsupported in this pending litigation. For your information, the news made by these hop growers in the spring of '55 and the spring of '56 preceded the U.S.D.A. approval for use of heptachlor formulations on hop lands. The subsequent withdrawal of that approval by the U.S.D.A. in 1959 was taken properly as a precaution, in view of the litigation which had been filed, and not as a prejudging of the plaintiffs' allegations.

Elsewhere the author attributes "all the unpleasant attributes" of DDT to chlordane. The inaccuracy of any such broad statement should be obvious to you. These are but a few of many inaccurate and misleading statements made regarding chlordane and heptachlor.

The articles as they appear in "The New Yorker" present larger questions of ethics and morality. We refuse to believe that publishers generally are willing to publish anything to make a dollar. Inferences that the chemical industry is not required to, and does not make exhaustive tests to determine the effectiveness of pesticides, their toxic potentials, and, if used in connection with food crops, additional long-range studies to determine the residues and the safety of same on food crops, but, on the contrary, introduces untried pesticides for the sake of making a quick dollar, are untrue and unfair.

The simple truth is that pesticides and other agricultural chemicals are essential if we are to continue to enjoy the most abundant and purest foods ever enjoyed by any country of this world. As stated by the A.M.A. Council on Foods and Nutrition, in the J.A.M.A. issue of November 18, 1961, page 749:

The Council on Foods and Nutrition recognizes the contributions that chemical substances in food production, processing, and preservation have made to the quality and quantity of the American food supply. While many chemical additives are essential to efficient agricultural production, others are vital to the manufacture of food products. There is no reason to believe that the present use of chemicals in foods is endangering the health of people.

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Responsible manufacturers have made careful safety tests before the introduction of new chemicals, and the Food and Drug Administration is diligently and effectively protecting consumers from presence of hazardous chemicals under existing Federal laws."

"Organic" farming cannot maintain this abundance of food because of a lack of sufficient volume of organics. Biological controls of pests are effective in only isolated instances. In the meantime, man must use his intelligence to weigh the balance of nature in his favor to assure an adequate food supply and protect against disease. The false idea that some benign balance of nature exists, overlooks the fact that no benign balance of nature protected the dinosaur, the hairy mammoth, nor does it provide adequate food and protection from disease in those many areas of this world where great sacrifices are being made by the members of the World Health Organization and agricultural advisers, who have started to use pesticides there to the substantial benefit of those people.

It is true there have been, and will continue to be, misuses of pesticides just as there are misuses of aspirin, the most frequently misused solid or liquid, and just as there are misuses of all materials, such as the recent misuse of salt instead of dextrose in infant formulas, as pointed out by Dr. Wayland J. Hayes of the United States Public Health Service in the July, 1961 issue of the "Archives of Environmental Health", published by the American Medical Association.

"For over 20 years, the death rate in the United States associated with accidental poisoning by solids and liquids has varied from 0.6 to 1.2 per 100,000 population. In recent years, it has usually been 0.9 per 100,000 population. This represents a considerable improvement over rates of 3.4 to 5.2 recorded between 1900 and 1909. Conley reported that 7.8% to 12.8% of poisoning cases each year from 1946 to 1955 were caused by pesticides. The value found by Short in an especially careful study of the 1956 statistics fell within this range. Thus, the death rate from pesticides in the United States is approximately 0.09 per 100,000. Of the 152 deaths caused by all pesticides in 1956, 104 were caused by compounds introduced before DDT--54 attributed to arsenic alone. Only 35 deaths definitely were associated with new synthetic compounds, although some of the 13 other deaths caused by unidentified pesticides were probably caused by synthetics. Of the 35 deaths, 16 were caused by organic phosphorus insecticides. During 1956, children up through the age of 9 years accounted for 94 deaths from pesticides (62%); 78, or just over one-half of the total number, were in children 3 years of younger. These figures,

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similar to those reported by Conley for 1946 to 1955, suggest that it is most important to consider poisoning in connection with children and important to consider the other pesticides, as well as the newer ones, in every case of suspected poisoning.

It is unfair to state or imply that modern pesticides, which have largely replaced the old ones, are endangering the population of the present instance of suicides and gross accidents as indicated by the above. It is unfair to imply that the authorities in approving directions for use, fail to allow for the margin of error. It is unfair, for example, to over-emphasize a gross industrial accident involving a solution of chloroform and other chemicals in relation to infer that similar incidents may occur from the normal use of chloroform formulations, which have been used as a disinfectant, for example, ever since the late 1800s, during which period they have been more widely used in millions of households, applications, for vermin control and in hospitals and public buildings than any other.

The pesticides industry spends substantial sums of money to educate the public in the use of pesticides, as directed. Publications which do not understand the distinction between toxicity and hazard, publications which quote authority opinions of scientists made out of their field of knowledge, publications which falsely attribute safety to actually occurring pesticides, publications which quote out of context (such as Dr. Lehmann's 1950 statement regarding chloroform, at which time another brand with impurities was in existence, which brand went out of existence shortly thereafter, as is recognized by Revision 1 of Interpretation 19 issued under the Federal Insecticide, Fungicide and Rodenticide Act), do a disservice to the public in establishing a misbelief that our laws are inadequate and that pesticide labels have little meaning and that Government and industry members are not interested in safety.

Unfortunately, in addition to the sincere expressions of opinions by natural food eaters, Audubon groups and others, Europe must deal with sinister influences, whose attacks on the chemical industry have a dual purpose: (1) to create the false impression that all business is grasping and immoral, and (2) to reduce the use of agricultural chemicals in this country and in the countries of western Europe, so that our supply of food will be reduced to east-European parity. Many innocent groups are financed and led into attacks on the chemical industry by these sinister parties. In some other instances, fictitiously signed letters and mimeographs independently are circulated, as was true approximately two years ago in California. Governor Brown was led by such papers to appoint a special investigative committee, which

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committee then learned that the flood of documents, which had been sent to all newspapers, health departments, and legislators of the state, were fictionally signed.

We have gone to some length to point out a few of the inaccurate and deceptive statements made as to chlordane and heptachlor and, in addition, had A.M.A. Council on Foods and Nutrition and Dr. Wilton D. Snyder of the United States Public Health Service, to investigate the matter. We discussed with him and to acquaint you to some extent with the unfortunate consequences which will result if heptachlor is distributed as a body substantially as it has been distributed. We would appreciate your letting us know whether or not you should publish this information. We will be glad, however, that any information or illustrations and reports of our agents and staff.

Sincerely yours,

NATIONAL NUTRITIONAL CORPORATION
[Signature]

1000 17th Avenue
New York, New York
and General Counsel

LAWSON

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