CHAPTER 6

Studies as an Excuse for Inaction: The Saga of 2,4,5-T

Background

In 1962 the publication of Rachel Carson's *Silent Spring*[1] touched off a tremendous debate over the environmental and health impact of the use of pesticides. Among other dangers, she pointed out the likelihood that some of the chemicals being used as pesticides were carcinogenic, teratogenic, and/or mutagenic (capable of producing cancer, birth defects, and/or gene defects, respectively). The subsequent report on pesticides of the President's Science Advisory Committee recommended that tests for these effects be conducted on laboratory animals.[2] Accordingly, in summer 1963 the National Cancer Institute (a division of the federal government's National Institutes of Health) contracted with the independent Bionetics Research Laboratories in Bethesda, Maryland to perform such studies.[3] After the studies had been commissioned, however, the research stretched out over years with no published results.

One of the chemicals which Bionetics was commissioned to study was the herbicide 2,4,5-trichlorophenoxyacetic acid, commonly known as 2,4,5-T. The U.S. Army had tested this chemical during World War II for possible use as a defoliant–i.e., to remove concealing foliage.[4] The war ended before it could be used, however. After the war the chemical was introduced into the domestic market as a weed and brush killer. By 1965 it had become so popular that 13 million pounds of 2,4,5-T were being manufactured annually in the United States.[5]

Army testing of 2,4,5-T as a defoliant continued after World War II, with large-scale field tests being conducted in Puerto Rico and Thailand. Finally, the Vietnam War presented an opportunity for the military use of defoliants. From a

small beginning in 1961 their use expanded rapidly until the period 1967-1969, when about 2,500 square miles of South Vietnamese forest were being defoliated yearly–about 90 percent using "Agent Orange," a 50-50 mixture of 2,4,5-T and another popular herbicide, 2,4-D.[6] Because of the density of the jungle and in order to have quick results, about ten times as much herbicide was used per acre in South Vietnam as is recommended for domestic use. Indeed, most of the U.S. production of 2,4,5-T was being dumped on Vietnam, and for a time it was difficult to obtain the chemical for domestic purposes.[7] Production was rapidly expanded, however, and by 1968 about 42 million pounds were being produced annually in the United States–more than double the 1966 figure of 18 million pounds.[8]

The Bionetics Reports

In June 1966, while the use of 2,4,5-T was still increasing in Vietnam, the Bionetics Research Laboratories informed the National Cancer Institute (NCI) that its tests on pregnant mice injected with small amounts of 2,4,5-T resulted in greatly increased numbers of birth defects.[9]

The reaction of the NCI was remarkable. Instead of warning the public or the responsible government agencies of the possible danger, the Institute sent the matter back to Bionetics for further study. Surgeon General Jesse Steinfeld later attempted to justify this action by stating that "at that point we did not know whether the results produced by injection were significant. The 2,4,5-T had not been fed."[10] Bionetics apparently was not pressed for further results, however, and two years passed before a second report was delivered to the NCI. The conclusion: 2,4,5-T was also teratogenic in mice when administered orally.[11]

Still the government hardly stirred. According to Surgeon General Steinfeld's later account, on January 30, 1969,

> a special preliminary report on the teratogenicity of 2,4,5-T [was made available] at a meeting of scientists from the National Institutes of Health with representatives of the regulatory agencies, Consumer Protection and Environmental Health Services, the National Academy of Sciences, and the chemical industry, attended also by Drs. Phillippe Shubik and Samuel Epstein [two outside scientists].[12]

The meeting did not result in any action, however. The report was passed on the National Institute of Environmental Health Sciences, which according to Steinfeld then spent nine more months conducting "extensive statistical analyses" on the data.[13] (This assertion mystifies us. Having seen the data, we do not see how it would be possible for a competent statistician to spend more than a few days making all reasonable statistical checks for significance of the Bionetics data.[14]

The Mrak Commission

By 1969 seven years had passed since the publication of *Silent Spring*, and the lack of government efforts to tighten the regulation of pesticide use had become obvious. As a result pressure from environmental groups began to mount, stimulating in turn increased resistance from the chemical industry and the political representatives of agriculture. The debate over the banning of DDT became the principal battleground, and the next development in our story of 2,4,5-T was triggered by an incident in that fight.

In April 1969 the Food and Drug Administration (FDA) seized 34,000 pounds of frozen Lake Michigan coho salmon because the fish contained in their fat higher levels of DDT than the limits set by the FDA for meat. This action angered the Republican governors of the states adjoining Lake Michigan as well as Republican House Minority Leader Gerald Ford (Mich.), in whose district the hapless salmon shipper resided. In response to the protests of these important gentlemen and to the rising level of controversy about pesticides in general, Secretary of Health, Education, and Welfare Robert Finch immediately set up a Commission on Pesticides and Their Relationship to Environmental Health. (The commission became known popularly as the Mrak Commission after its chairman Dr. Emil Mrak, Chancellor Emeritus of the University of California at Davis.)[15] The Mrak Commission set up in turn various panels, one of which, the teratology panel, was concerned with assessing the dangers of birth defects resulting from human exposure to various pesticides.

In August 1969—more than three years after Bionetics Research Laboratories had first reported to the government that 2,4,5-T was teratogenic—the teratology panel of the Mrak Commission asked for Bionetics' findings. The request was refused on the grounds that the analysis was not yet complete.[16] On September 24, the panel was finally given the desired information. According to the cochairman of the panel, Dr. Samuel Epstein, this was accomplished "by pulling teeth."[17] On the basis of Bionetics' findings, the teratology panel of the Mrak Commission later recommended in its report that use of 2,4,5-T and a number of other pesticides which had been shown to be teratogenic "be immediately restricted to prevent risk of human exposure."[18]

The Bionetics Report Becomes Public

It is not clear how long the Bionetics results and the Mrak Commission recommendations would have remained secret had it not been for Anita Johnson, who worked with a group sponsored by consumer advocate Ralph Nader studying the food regulation activities of the FDA during the summer of 1969. In going through FDA files, Miss Johnson happened upon a copy of the preliminary report of the Bionetics findings. In September she mentioned the

report to a friend, a graduate student in biology at Harvard, who in turn mentioned it in early October to Harvard biologist Matthew Meselson.[19]

Meselson had been deeply involved in the national debates over the United States' stance on chemical and biological warfare, and was already concerned about the teratogenic potential of herbicides. Furthermore, his attention had been called to disturbing stories in South Vietnamese newspapers claiming extraordinary rashes of birth defects in areas which had been defoliated.[20] But, when he tried to get copies of the Bionetics reports, he was informed that they were "confidential and classified".[21]

Meselson soon got copies of the Bionetics reports via an unofficial route. The implications of their findings seemed so serious to him that he immediately informed Lee DuBridge, the President's science advisor.[22] A few weeks later the Nixon administration somehow learned that reporter Bryce Nelson of the *Los Angeles Times* was about to break the story. On October 29, 1969, Nelson was called by the White House just as he was finishing his article[23] and was told that DuBridge had just released a statement in which he announced that, because of the Bionetics findings, "a coordinated series of actions are being taken by the agencies of Government to restrict the use of the weed-killing chemical, 2,4,5-T. . . . The actions taken will assure safety of the public while further evidence is being sought."[24] The major actions announced by DuBridge were as follows:

> The Department of Agriculture will cancel registrations of 2,4,5-T for use on food crops effective January 1, 1970, unless by that time the Food and Drug Administration has found a basis for establishing a safe legal tolerance in and on foods. . . .
>
> The Departments of Agriculture and Interior will stop use in their own programs of 2,4,5-T in populated areas or where residues from use could otherwise reach man.
>
> The Department of Defense will restrict the use of 2,4,5-T to areas remote from the population.[25]

On December 5, the Mrak commission report was released.[26]

Dow Chemical Counterattacks

The Department of the Interior carried out the commitment made for it by DuBridge, terminating the use of 2,4,5-T under its control.[27] By January 1, 1970, however, neither the Department of Agriculture nor the Department of Defense had acted to restrict the use of 2,4,5-T in the United States or in South Vietnam. In response to inquiries both departments justified their inaction by stating that it now appeared probable that a contaminant—2,3,7,8-tetrachlorodibenzoparadioxin, commonly known as "dioxin"—and not the chemical 2,4,5-T itself, had caused the teratogenic effects observed in the Bionetics

tests.[28] Therefore, the argument went, if the manufacturers changed their production techniques to minimize this impurity, continued use of 2,4,5-T would be acceptable. This thesis with which the Departments of Agriculture and Defense justified their inaction had been put forward by the Dow Chemical Company, one of the major manufacturers of 2,4,5-T.

The Dow counteroffensive was organized by Dr. Julius E. Johnson, Dow Vice President and Director of Research and a member of the Mrak Commission. (Such conflict-of-interest situations are not uncommon on government advisory committees.) On November 7 he had presented the dioxin theory to the Commission, but was unable to influence its conclusion that 2,4,5-T is a teratogen. Johnson then met on November 25 with officials of the National Cancer Institute and made arrangements for Dow to conduct a new study of the teratogenicity of 2,4,5-T for the NCI with a sample containing much less dioxin than that used by Bionetics. On December 1 he met with DuBridge and informed him of this agreement.[29]

On January 12, 1970, six weeks after designing the study, Dow communicated its findings to the Department of Health, Education, and Welfare (HEW) and the Department of Agriculture, claiming confirmation of its contention that "purified" 2,4,5-T does not cause birth defects. This claim stimulated scientists at both the Food and Drug Administration and the National Institutes of Health to undertake their own tests of the Dow theory.[30]

On February 24 the results of the government studies were presented in a meeting at the Food and Drug Administration.[31] Contrary to the Dow results, the government studies showed that even purified 2,4,5-T was as potent a teratogen as thalidomide, a sedative whose use by pregnant women in Europe in the period 1954-1962 resulted in the birth of thousands of children lacking complete arms and legs. (The dioxin impurity was found to be up to 100,000 times more potent, however. Since the Bionetics sample contained about 30 parts per million dioxin, the effects of the dioxin and those of the 2,4,5-T which it contained were probably roughly comparable.) The discrepancy between Dow's and the government's tests was subsequently partially explained by the facts that: (1) the Dow experimenters administered dosages of 2,4,5-T considerably smaller than those used in the government tests and in most of the Bionetics tests, and (2) Dow scientists had redefined for their own purposes the meaning of the term *teratogenic* to exclude certain effects which the government scientists considered to be birth defects.[32]

It should be noted that it took the government and Dow scientists only six weeks each to execute experiments designed to test the theory which Dow had put forward in defense of continued use of 2,4,5-T. These tests were essentially identical to the Bionetics study, the completion of which had been delayed more than three years by the sponsoring governmental agency after the preliminary results had given evidence of a potentially serious public health hazard. It is hard to imagine better evidence that the government had dragged its feet on the Bionetics results than the almost unseemly haste with which it moved when the possibility was raised that the suspected chemical might be exonerated.

The Congressional Investigation

Both the Departments of Agriculture and Defense clung to the Dow theory for some weeks after it had been deflated. And the White House displayed no inclination to galvanize them into action.

In February 1970, Representative Richard McCarthy (D.-N.Y.), a leading opponent of the use of chemical and biological warfare techniques, wrote to the President's science advisor asking him why the government's commitment to restrict 2,4,5-T by January 1 had not been honored. DuBridge replied:

> The October 29 announcement that you referred to was a statement of the actions that were planned to be taken by the various units of the Federal Government in relation to the 2,4,5-T. It was not a directive to the agencies for the simple reason that statutory responsibility for these decisions rests in the separate agencies.[33]

Representative McCarthy's reception of this explanation was understandably somewhat skeptical:

> This is obviously a retreat from the position taken by the White House on October 29. As I read the statement at that time it was in the form of a directive that the departments will do such and such, now we find that the White House is backing off from this and is saying that the statutory authority rests with the agencies.
>
> It seems to me that the President of the United States has authority—the ultimate authority over these agencies.[34]

On the same day (February 10) that Representative McCarthy received DuBridge's letter, Senator Philip Hart (D.-Mich.) announced that he would conduct hearings on the status of 2,4,5-T. Senator Hart's two days of hearings were held on April 7 and 15. This public exposure appears to have stirred the administration out of its paralysis once again. On the second day of hearings, Surgeon General Steinfeld began his testimony with the announcement that

> new information reported to HEW on Monday, April 13, 1970, indicates that 2,4,5-T and its contaminant dioxins may produce abnormal development in unborn animals. Nearly pure 2,4,5-T was reported to cause birth defects when injected at high doses into experimental pregnant mice, but not in rats.[35]

Steinfeld was apparently trying to give the appearance of efficiency by saying that HEW had only learned of the teratogenicity of 2,4,5-T two days before. In fact, as we have already noted, these results had been reported at a meeting at the FDA (an agency within HEW) on February 24. (The rat experiment to which he referred was that by Dow, the experiment on mice by the National Institute of Environmental Health Sciences. Steinfeld did not mention an experiment done with hamsters at the FDA, which had also shown that purified 2, 4, 5-T causes birth defects.) It is also of interest that the government experiment which Steinfeld cited—that done by injection of mice with 2,4,5-T—was identical with the experiment done at Bionetics nearly four years before and labeled as being

of uncertain significance by the government because (in Steinfeld's own words) "the 2,4,5-T had not been fed".

After announcing his "new information," Steinfeld proceeded to announce the restrictions which the government was imposing on the use of 2,4,5-T as a result: He announced

> the immediate suspension by Agriculture of the registrations of the liquid formulations of the weed killer, 2,4,5-T, for use around the home and for registered uses on lakes, ponds, and ditch banks.... The Department of Agriculture intends to cancel registered uses of non-liquid-formulations of 2,4,5-T around the home and on all food crops for human consumption... for which it is presently registered.... These actions do not eliminate registered uses of 2,4,5-T for control of weed and brush on range, pasture, forests, rights of way and other non-agricultural land.[36]

The impact of this announcement was less dramatic than it might sound. The unaffected category of uses comprised about 75 percent of domestic usage of 2,4,5-T.[37] As for the "restrictions" on the remaining domestic uses, the public announcement did not make clear the significance of the distinction between the terms "suspension of registration" and "cancellation of registration."

Surely a majority of citizens hearing the announcement that the "registered uses of non-liquid formulations of 2,4,5-T around the home and on all food crops for human consumption" had been "canceled" would come to the conclusion that they need no longer worry about pregnant women being exposed to 2,4,5-T in their food or from weed killers applied to lawns. In fact, however, "cancellation" permits the use of pesticides until the chemical companies have exhausted a lengthy administrative appeal procedure. Only those few uses of 2,4,5-T for which the registration had been "suspended" were immediately affected, since "suspension" had the effect of outlawing these uses of the pesticide until the manufacturer could establish that they were safe. The choice between "suspension" and "cancellation" was made by the Agriculture Department according to whether or not, in its judgment, a use of 2,4,5-T was an "imminent hazard to the public."[38]

Another consequence of the administration's public disavowal of the Dow contaminant theory was that, on April 15, the Defense Department announced that Deputy Secretary of Defense David Packard had "temporarily suspended the use of 2,4,5-T for military operations pending further evaluation."[39]

The PSAC Review

One of the witnesses whom Senator Hart invited to appear at his hearings on the *Effects of 2,4,5-T on Man and the Environment* was the government official who had first made the Bionetics results public—Lee DuBridge, the President's science advisor. Instead of appearing in person, however, DuBridge sent a brief

statement. The only new information which it contained was that, following his hurried announcement in October 1969 of government restrictions on the use of 2,4,5-T, DuBridge had appointed a panel of scientists under the President's Science Advisory Committee (PSAC) "to review all that is known about 2,4,5-T."[40] The statement continued: "This panel has prepared a report on the subject which I expect to make available within a few weeks."[41]

In fact, it was more than a year later before DuBridge's successor, Edward David, Jr., released the *Report on 2,4,5-T*—and then only after revelations by a group of independent scientists of the destruction resulting from the defoliation program in Vietnam had forced termination of the program in December 1970. The discussion in the PSAC report of the risks and benefits of domestic 2,4,5-T use seems reasonably objective—although critics have pointed out some crucial omissions.[42] The discussion of the use of 2,4,5-T in the South Vietnam defoliation program can only be characterized as a "whitewash."

The report discussed three aspects of the defoliation program: its military usefulness; the maximum possible amount of exposure of pregnant South Vietnamese women to 2,4,5-T and the possible teratogenic consequences of that exposure; and the ecological impact of the defoliation program.

The entire discussion of the military usefulness of the defoliation program was devoted to excerpts from testimony in which Rear Admiral W. E. Lemos had defended the program before a Congressional committee. The excerpts—which consist almost entirely of anecdotes concerning improvements in security in a few local areas as a result of the defoliation programs—seem almost irrelevant on the scale of justification required for a program which resulted in the defoliation of almost 10 percent of South Vietnam.[43] The report does not even mention the political impact in Vietnam of the defoliation program.

Regarding the possibility that use of 2,4,5-T had caused birth defects in Vietnam, the report dismissed what evidence there was with a sentence:

> The lack of accurate epidemiological data on the incidence and kinds of birth defects in the Vietnamese population before or since the military use of defoliants precludes any estimate as to whether an increase in birth defects has occurred.[44]

The panel did not recommend that an attempt be made to collect such data. This initiative was taken later by independent scientists under the auspices of the American Association for the Advancement of Science. (See Chapter 11.) The panel then turned to theoretical "calculations of potential human exposures from sources such as drinking water or direct fall-out." From these calculations the panel concluded that the exposure of pregnant women to 2,4,5-T through their food or water could approach the levels at which birth defects had been caused in mice and rats. Each time it arrived at such a conclusion the panel quickly retreated, however, emphasizing how improbable it was for any individual to have suffered such an exposure. No mention was made of the possibility that birth defects in humans might be caused at lower levels of exposure than in rodents. (After the thalidomide disaster, it had been learned

that the teratogenetic effect of equal proportions of thalidomide is 100 times greater on humans than on rats and 700 times greater than on hamsters.[45])

Finally, turning to the discussion in the report of the ecological impact of the defoliation program in South Vietnam, we find—nothing. Under the chapter heading "Some Ecological Effects" we find a listing of almost trivial items, such as that "when cottontail rabbits were given a choice of either 2,4,5-T treated vegetation or untreated, the rabbits consumed almost none of the treated vegetation"[46]; but we find not a single mention of the ecological impact of the defoliation and partial destruction of one-third of South Vietnam's jungle and the complete destruction of more than 20 percent of South Vietnam's mangrove forests by defoliation.

How can one account for the bias of the PSAC report on the subject of defoliation? One observer interviewed by the Washington correspondent of *Nature* magazine offered the explanation that "it was not the habit of PSAC to buck the Joint Chiefs of Staff, at least not under DuBridge."[47] Whatever the true explanation, the PSAC report on 2,4,5-T is further evidence of the decline of PSAC following the contemptuous treatment given its advice on the deployment of the Sentinel antiballistic missile system in 1967.

The Advisory Committee on the Chemical Companies' Appeal

The decision of the Agriculture Department to "cancel" rather than "suspend" the registration of 2,4,5-T for use on food crops was appealed by two of the manufacturers of 2,4,5-T, Dow Chemical and Hercules Corporation.[48] The appeal procedure required yet another advisory committee, appointed from a list of scientists provided by the National Academy of Sciences (NAS). (The NAS acted with apparent lack of concern for conflict of interest, including on its list of nominees one employee each of Dow Chemical and Monsanto, two of the three American chemical companies manufacturing 2,4,5-T.[49]) When the advisory committee finally reported its recommendations on May 7, 1971, it was not to the Secretary of Agriculture but instead to the Administrator of the newly created Environmental Protection Agency (EPA), which had taken over the responsibility for registering pesticides. The advisory committee report gave 2,4,5-T a clean bill of health—provided that the dioxin contamination was reduced to specified low levels.

One member of the advisory committee, Theodore Sterling, an Assistant Professor of Biostatistics at Washington University in St. Louis, disagreed and filed a minority report. Sterling agreed that it had not been established that 2,4,5-T was a public health hazard, but he also felt that it was premature to exonerate the chemical. He therefore concluded:

> The Surgeon General was justified in feeling that a prudent course of action must be based on the decision that exposure to this herbicide may present an imminent hazard to women of child-bearing age. Hence, we [the advisory committee] can only recommend that the registration of 2,4,5-T be suspended and/or cancelled for use around the home, recreation areas, and similar sites and on all crops intended for human consumption. However, use of 2,4,5-T may be permitted under certain conditions for uses in forestation and rights of way.[50]

Sterling's dissent had no impact within the EPA. Staff scientists reviewed the report and appear to have endorsed the conclusions of the majority.

The EPA Advisory Report is Leaked

EPA Administrator William Ruckelshaus presumably would have implemented the advisory committee's recommendations in due course if the report had not been leaked to outside scientists, some of whom found themselves in much closer accord with Sterling's conclusions than with those of the committee's majority. On July 14, 1971, a group of these scientists organized by the Committee for Environmental Information and Ralph Nader's Center for the Study of Responsive Law held a news conference in Washington, D.C., in which they presented criticisms of the advisory report substantially the same as Sterling's.[51]

This time the EPA administration apparently heard the criticisms for it responded by turning for advice to scientists outside the agency—notably to scientists in the Food and Drug Administration who had conducted many of the experiments on the teratogenicity of 2,4,5-T. (It should be noted that, while the Agriculture Department-EPA advisory committee had not consulted these scientists, it *had* consulted with spokesmen for the manufacturers of 2,4,5-T. The advisory committee had even been presented with the results of a new study commissioned from the Bionetics Research Laboratories by one of the petitioners, the Hercules Corporation. This new study, represented as a replication of the original Bionetics study using purified 2,4,5-T, reported no birth defects. An investigation revealed an "error," however: in its "repeat study" Bionetics had used dosages of 2,4,5-T more than ten times smaller than those used in the original experiment.[52]) Following these consultations, Ruckelshaus decided to reject the advisory committee report and to go on to the next stage of the appeals procedure: public hearings.[53] At the time of this writing the hearings—after being delayed by a Dow Chemical Company lawsuit for two years[54]—are scheduled to begin in April 1974.

Thus we see how, more than ten years after Rachel Carson's first warning and five years after the first Bionetics report on the teratogenicity of 2,4,5-T, after the Mrak Commission report, the PSAC panel report, and the EPA advisory committee report, the government was still asking for advice as to what measures, if any, it should take to restrict 2,4,5-T. Meanwhile, the chemical

companies continued to sell the chemical to whomever would buy it. It should also be noted that, although debate focused on 2,4,5-T, this chemical was only one of ten found to be teratogenic by Bionetics in the small sample of pesticides that it tested. Hence the title of our chapter.

NOTES

1. Rachel Carson, *Silent Spring* (Boston: Houghton Mifflin Co., 1962).
2. U.S., Executive Office of the President, Office of Science and Technology, *Use of Pesticides*, a Report of the President's Science Advisory Committee (Washington D.C.: Government Printing Office, May 1963). See also pp. 43-45 above.
3. Testimony of Dr. Jesse Steinfeld, Surgeon General, Department of Health, Education, and Welfare, before the U.S. Congress, Senate, Committee on Commerce, *Effects of 2,4,5-T on Man and the Environment* (hereafter referred to as *Effects of 2,4,5-T*), 91st Congress, 2nd Session, April 7 and 15, 1970. In this testimony will be found a chronology of government activities with regard to the determination of the teratogenicity of 2,4,5-T, along with Steinfeld's explanatory remarks (pp. 178-180).
4. Arthur Galston, "Warfare with Herbicides in Vietnam," in *Patient Earth*, edited by John Harte and Robert Socolow (New York: Holt, Rinehart and Winston, 1971), pp. 139-140.
5. U.S., Executive Office of the President, Office of Science and Technology, *Report on 2,4,5-T*, A report of the Panel on Herbicides of the President's Science Advisory Committee (Washington, D.C.: Government Printing Office, March 1971), p. 26.
6. Thomas Whiteside, *Defoliation* (New York: Ballantine, 1970), p. 1. Military Assistance Command figures for yearly total acreage defoliated and acreage of crop destruction in South Vietnam for 1962 through the first quarter of 1969 are given on p. 85. More complete figures are given in Chapter, reference 55.
7. *Report on 2,4,5-T*, p. 29.
8. Ibid. p. 26.
9. Steinfeld, *Effects of 2,4,5-T*, pp. 178-180.
10. Ibid.
11. Ibid.
12. Ibid.
13. Ibid.
14. The Bionetics results were first released in U.S., Department of Health, Education, and Welfare, *Report of the Secretary's Commission on Pesticides and Their Relationship to Environmental Health* (hereafter referred to as *Report of the Secretary's Commission on Pesticides*), (Washington, D.C.: Government Printing Office, December 1969), pp. 665-674. See also K. Diane Courtney, D. W. Gaylor, M. D. Hogan, H. L. Falk, R. B. Bates, and I. Mitchell, "Teratogenic Evaluation of 2,4,5-T," *Science* 168 (1970): 864.
15. James Singer, "DDT Debate Warms Up Again: Should the Government Restrict Its Use?" *National Journal*, 1 (1969): p. 1. John E. Blodgett of the Congressional Research Service in an unpublished manuscript, *Federal Ad Hoc Committees on Pesticides, 1955-1969* (July 1972), pp. II-11, II-12, describes in greater detail some of the pressures on Finch at this time. They included Government Accounting Office (GAO) reports, which described how the Department of Agriculture was ignoring HEW's advice about pesticide regulation, a Nader Summer Study Group investigation into the food protection activities of HEW's Food and Drug Administration, and, of course, the Bionetics Laboratories results.

Blodgett quotes one of Finch's aides as saying, "It was a political expedience sort of thing—Finch was being clobbered from all sides on pesticides safety."
16. Dr. Paul Kotin, Director of the National Institutes of Health, defended this refusal in his testimony in *Effects of 2,4,5-T*, pp. 94-97.
17. Quoted by Whiteside, *Defoliation*, p. 19.
18. *Report of the Secretary's Commission on Pesticides*, pp. 657-658.
19. Whiteside, *Defoliation*, p. 21.
20. Ralph Blumenthal, "U.S. Shows Signs of Concern Over Effect of 9-Year Defoliation Program in Vietnam," *New York Times*, March 15, 1970, p. 14, stated: "Vietnamese newspapers have been suspended for publishing articles about birth defects allegedly attributed to defoliants, and the public Health Ministry declines to provide any statistics on normal and abnormal births."
21. Quoted in Whiteside, *Defoliation*, pp. 21-22.
22. Ibid.
23. Bryce Nelson, private communication. See also Bryce Nelson, "Herbicide Order on 2,4,5-T Issued at Unusually High Level", *Science* 166 (1969): 977.
24. Quoted in Whiteside, *Defoliation*, pp. 94-95.
25. Ibid.
26. *Report of the Secretary's Commission on Pesticides.*
27. Testimony of Harrison Wellford, Center for Study of Responsive Law, Washington, D.C., in *Effects of 2,4,5-T*, pp. 7-8.
28. Department of Agriculture: Testimony of Dr. Ned D. Bayley, Director of Science and Education, Department of Agriculture, *Effects of 2,4,5-T*, p. 35. Department of Defense: inserted into the record, U.S. Congress, House, Committee on Armed Services, *Hearings on Research, Development, Testing, and Evaluation Program for Fiscal Year 1971* (hereafter referred to as *Hearings on 1971 RDT and E*) 91st Congress, 2nd Session, March 10-25, 1971, Part II, Appendix, pp. vii-viii.
29. Testimony of Dr. Julius E. Johnson, Vice President and Director of Research, Dow Chemical Company, *Effects of 2,4,5-T*, pp. 374-377.
30. Testimony of Surgeon General Steinfeld, *Effects of 2,4,5-T*, pp. 178-180.
31. Ibid.
32. Testimony of Dr. Samuel S. Epstein, co-chairman of the teratology panel of the Secretary's Commission on Pesticides, in *Effects of 2,4,5-T*, pp. 409-411. See also Nicholas Wade, "Dow Redefines Word It Doesn't Like," *Science* 176 (1972): 262.
33. DuBridge's letter and McCarthy's comments are reprinted in *Effects of 2,4,5-T*, p. 144.
34. Ibid.
35. The news release from which Dr. Steinfeld read these quotes is reprinted in *Effects of 2,4,5-T.*
36. Ibid.
37. Jamie Heard, "Restrictions on Controversial 2,4,5-T Fail to Satisfy Weed Killer's Critics", *National Journal*, April 25, 1970, p. 872.
38. Federal Insecticide, Fungicide and Rodenticide Act (7 U.S.C. 135) as amended in 1964. See Chapter 10 and the presentation of the legal battle over DDT for a more detailed discussion of these fine distinctions.
39. *Hearings on 1971 RDT and E*, Part II, Appendix, pp. vii-viii.
40. DuBridge's statement may be found reprinted in *Effects of 2,4,5-T*, pp. 452-455.
41. Ibid.
42. "PSAC Hiccoughs Over 2,4,5-T," *Nature*, May 28, 1971, p. 210.
43. *The Effects of Herbicides in South Vietnam: Summary and Conclusions* (Washington: National Academy of Sciences, 1974) p. 5-6.
44. *Report on 2,4,5-T*, p. 3.
45. Testimony of Samuel Epstein, M.D., U.S. Congress, Senate, Government Operations Committee, *Hearings on Chemicals and the Future*, 92nd Congress, 1st Session, April, 1971, p. 51.

46. *Report on 2,4,5-T*, p. 65.
47. "PSAC Hiccoughs Over 2,4,5-T," *Nature*.
48. Epstein, *Hearings on Chemicals and the Future*.
49. Nicholas Wade, "2,4,5-T Committee: Bias Untested, Academy Embarrassed", *Science* 173 (1971) p. 611.
50. U.S. Environmental Protection Agency, *Report of the Advisory Committee on 2,4,5-T*, May 7, 1971, p. 69.
51. Constance Holden, "Critics Weigh EPA Herbicide Report, Find it Wanting," *Science* 173 (1971) p. 312; see also: Committee for Environmental Information, "Critique of the Report of the Advisory Committee on 2,4,5-T," *Environment*, September 1971, p. 24.
52. Nicholas Wade, "Decision on 2,4,5-T: Leaked Reports Compel Regulatory Responsibility", *Science* 173 (1971) pp. 610-615.
53. Terri Aaronson, "Gamble", *Environment*, September 1971, p. 21.
54. Dow Chemical Co. v. Ruckelshaus, 477 F. 2d 1317 (C.A. 8th Cir. 1973).

CHAPTER 7

The Politician's Helper: Legitimizing the Cyclamates Decision

It is discouraging to find such conduct among public officials at the very time we are trying to impress upon our young people the importance of law and order.

—Representative L. H. Fountain on releasing the report of his subcommittee on federal regulation of cyclamate sweeteners.[1]

Advisory reports can be suppressed when their results are unwelcome or they can be commissioned as alternatives to facing up to unpleasant decisions, but at least the reports themselves are potentially useful if they get into the right hands—or are they? The case of the Medical Advisory Committee on Cyclamates illustrates dramatically that the advisory system itself can easily be corrupted. In this case, a government official who apparently wanted to give a political decision the appearance of technical legitimacy put together a committee of "experts" who obediently found reasons to tell him—and the public—what he wanted to hear.

Cyclamates were first used commercially as an artificial sweetener of foods in the early 1950s—primarily in special diets for the treatment of such conditions as diabetes. But in the 1960s their use became much more widespread, as the food industry conducted massive TV advertising campaigns extolling "diet" foods and soft drinks while panning over the contours of beautiful slim women.