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The Conclusion

The evidence was in: competent witnesses had clearly outlined the disastrous physical properties of DDT, its persistence, solubility in lipids, broad biological activity, and surprising mobility. They had outlined the consequences of these properties: the fact that DDT was being stored in body fat and in the fatty layers of the nervous system; that DDT was not remaining restricted to the pests it was set out to eradicate but was also affecting beneficial insects, fish, and birds; and that concentrations of DDT could now be found throughout the biosphere from the phytoplankton of the oceans to the penguins of the Antarctic, and could be found in alarming proportions in human mother's milk.

Witnesses had testified about the physiological effects of DDT: They showed that DDT was inducing the liver to produce nonspecific enzymes which, in turn, could degrade steroid hormones or could interfere with the pharmacological activity of drugs administered as part of medical treatment. In addition, they showed that DDT was affecting the transmission characteristics of the nervous system and had been found to mimic the action of certain hormones.

Witnesses had directly linked biologically-concentrating DDT to the lack of reproductive success in fish, mortality in fish fry, population crashes in the golden eagle, Bermuda petrel, peregrine falcon, and other raptorial birds, and had linked the spraying of elms with DDT to nervous symptoms and population declines in robins.

With this evidence in hand, on May 21, 1969, almost six months after the first testimony had been given, Hearing Examiner Van Susteren adjourned the Madison proceedings and retired to prepare his findings of fact and conclusions of law, neither of which was published until a year later. The public did not deliberate as long; aroused by the overwhelming evidence so thoroughly broadcast by an awakened press, they demanded results. And results they got; in the Department of Agriculture;* in the Department of the Interior; in the

*The effect of the ruling by this department has been diluted by the subsequent appeal of the five largest manufacturers of DDT.

regulatory legislation of state, local and foreign governments; and in further law suits instigated by Yannacone and other concerned lawyers and environmental groups.

Therefore, many may feel that Van Susteren's ruling, published symbolically, on May 21, 1970, is anticlimactic. However, it does represent the first judicial consideration of the evidence for and against the continued use of DDT. It lacks the emotional involvement of the partisans and advocates at the courtroom drama, but substitutes the impartial retrospection and judicial review of the testimony of all witnesses. The ruling* follows:

DDT, including one or more of its metabolites in any concentration or in combination with other chemicals at any level, within any tolerances, or in any amounts, is harmful to humans and found to be of public health significance. No concentrations, levels, tolerances, or amounts can be established. Chemical properties and characteristics of DDT enable it to be stored or accumulated in the human body and in each trophic level of various food chains, particularly the aquatic, which provides food for human consumption. Its ingestion and dosage therefore cannot be controlled and consequently its storage is uncontrolled. Minute amounts of the chemical, while not producing observable clinical effects, do have biochemical, pharmacological, and neurophysiological effects of public health significance.

No acute or chronic levels of DDT which are harmful to animal or aquatic life can be established. For the reasons above set forth, a chronic level may become an acute level. Feeding tests, laboratory experiments, and environmental studies establish that DDT or one or more of its analogs is harmful to raptors and waterfowl by interfering with their reproductive process and in other birds by having a direct neurophysiological effect.

Feeding tests or experiments and environmental studies establish that DDT at chronic low levels is harmful to fish by reducing their resistance to stress.

DDT and its analogs are therefore environmental pollutants within the definitions of Sections 144.01 (11) and 144.30 (9), Wisconsin Statutes, by contaminating and rendering unclean and impure the air, land, and waters of the state and making the same injurious to public health and deleterious to fish, bird, and animal life.

With the federal government and the general populace alerted to the DDT problem and with Van Susteren's opinion registered, it would be easy to become cocky about the pesticide problem. But is this justified? Just what alternatives are there to DDT, and are these alternatives any "safer" than the chlorinated hydrocarbons?†

Many of the substitutes used today in place of DDT are organophosphates, compounds with the requisite short life span but with a drawback—they are highly toxic to mammals and to many lower

*The entire opinion appears in the appendix, pages 191 to 206.

†The following discussion is summarized from Robert van den Bosch, "Prescribing for the environment," *Pesticides*, A Scientists' Institute for Public Information Workbook (New York, 1970): 3-8.

animals including not only the insect pests they are designed to eliminate but also their predators. So, once again, the old problem returns, the pesticide is knocking out natural biological controls, is causing outbreaks of previously innocuous insects, and is hastening the development of resistant strains. The ecological problem here is clear; what may be less obvious and equally important to the farmer is the economic problem that arises as resurgence, eradication of beneficial insects, and secondary outbreaks force increasingly larger and more frequent doses of pesticides—at an increasingly higher cost.

Obviously, what is needed is the development of pesticides with greater ecological selectivity. However, this will be difficult as such schemes directly oppose the present aims of the pesticide industry: to produce a product with as wide use as possible so that development and marketing costs can be met and a reasonable profit be made.

Better recommendations for pesticide use form another element in the environmental prescription. At present, pesticide industry salesmen, by necessity, serve as “diagnostician, therapist, and pill dispenser” often without the technical competence necessary to perform any one of the functions adequately and always with an economic conflict of interest that would make dispassionate analysis impossible.

Finally, more-enlightened procedures for screening and registering pesticides are needed to replace the present narrow standards of performance (killing efficiency) and safety to human health (the length of time the pesticide remains on a particular crop and the hazard that its residues will cause). In broadest terms, registration officials must know whether the percentages of insects killed are economically justified, and whether the problems engendered by the use of the pesticide will be greater than those solved.

Thus, it is obvious that new legislation is necessary if we are to accommodate the needs of modern society for intensive agricultural practices with high yields at low cost, and at the same time protect our fragile biosphere. Obviously, chemical pesticides have a place in modern agriculture but because they are inherently toxic they must be regulated. Therefore the challenge facing modern government is to develop ecologically sophisticated, socially relevant, politically feasible environmental legislation.