

With respect to birds the dangerous dosage was not reached until you reached 2 pounds per acre; and with respect to fish the dangerous dosage was not reached until you reached 0.5 pound per acre. These original decisions were based partly on what was felt to be all right for wildlife, what was considered to be insignificant mortality—which is a variable thing—and in ignorance of a secondary effect over and above the immediate effect. The secondary effect, of course, is the accumulation of D.D.T. through the food chain, with which you are familiar. We found horrible examples arising of what has been described as needless havoc, for example, in Dutch elm disease control or the attempt to delay the spread of Dutch elm disease by the use of D.D.T., which is used in this case not at 1 to 2 pounds per acre but at 1 to 2 pounds per tree, a fantastically high dosage. This resulted, in towns where elms were almost the exclusive shade tree, in the destruction of all the insect food for birds, and leaving only resistant bird foods such as earthworms. Earthworms, of course, were so contaminated with D.D.T. from the soil that a certain number—generally about a hundred—were sufficient to kill a robin. So there were deaths of birds, particularly robins, in these towns in the mid-western States where elms were almost the exclusive shade tree. This of course is offensive and is hard on the robins. If it can be avoided, naturally it should be; and it can be avoided by the substitution of D.D.T. by something which is almost as good against the elm bark beetle, which is the target, and which is not so persistent and is much more non-toxic to birds. That is methoxychlor. The substitution of methoxychlor, which was started about last year in Michigan, has now spread to Canada. The only trouble is that it costs more.

Other examples in Canada concern woodcock in New Brunswick, where one wildlife worker has detected a loss in reproductive success of these birds in D.D.T. sprayed areas, and he associates it with the experiments done at Laurel, Maryland by the U.S. Wildlife Service on pheasant and quail which have shown a reduction in reproductive success by feeding D.D.T. and dieldrin. He considers this degree of reproductive success in the woodcock is due to the D.D.T. When their body fat is examined it is found that the main chlorinated hydrocarbon in that body fat is not D.D.T. but heptachlor, a cyclodiene insecticide which is not used in New Brunswick at all—except perhaps on one farm—but which is freely used, along with analogous cyclodiene compounds, where woodcock go in the winter, namely the cotton-growing states bordering the gulf of Mexico. I will not say more but perhaps you will draw your own conclusions looking into this matter. The fish and wildlife service, were curiously enough, unable to confirm that there is any loss of reproductive success in woodcock, and so the problem becomes rather difficult. Another example concerns the bald eagle. One fact is sure: the nests which the eagles make now seldom have eggs, and those eggs which are produced seldom hatch. When those eggs are examined chemically they will be found to have a high amount of D.D.T. in them. Therefore a case should be made out, with regard to a bird such as the bald eagle which eats a great amount of fish before its gonads are mature, that it could have accumulated from the fish, which in turn have accumulated it from creeks draining agricultural areas, enough chlorinated hydrocarbon insecticides to cause either the non-lay or the non-hatch of such eggs. This is under active study by the U.S. fish and wildlife service, but they have been unable to reach any conclusions. They have also pointed out, in all fairness, that another of the reasons for the lack of reproductive success of the bald eagle is that suburbia has actually chivvied it out of most of its nesting sites.

It is clear that the widespread spraying of what might be called safe insecticides could have secondary effects which result not from one spraying but