

its danger; just like using cyanide in the old days. But now we have a tremendous range of organophosphorus insecticides—scores of them—and at least six of them are less toxic and some of them tend to be twenty times less toxic than aspirin itself. Indeed, one of them, malathion, has been used at the rate of twelve sprays per year to eradicate the Mediterranean fruit fly in Florida successfully without a single bird corpse having been found.

Thus we have now an arsenal of true insecticides, the key to whose development has been primarily that of maximum insecticidal efficacy and minimum human and higher-animal hazard. With these, as we know well, the situation in agriculture has been transformed. It is very difficult to set precise figures on this, but perhaps it is sufficient to say that with D.D.T. alone the entire crop of corn and of potatoes on this continent was increased by 60 per cent.

Now, of course, the question of residues and hazards in food to human consumers presents itself for consideration. This is a very interesting situation because frankly neither in the United States, in the United Kingdom nor in Canada have there been any cases of symptoms of poisoning of people who have consumed foods for sale by the regular outlets under present government regulations.

It is a fact that much of the so-called pesticide controversy has been a controversy because there are indeed no cases or instances to provide the quantitative levels on which you can come to some general practical conclusion. Thus indeed it becomes a controversy because the data simply is not there. Only two cases have been reported of over-application to a crop which has been eaten, and both of these were local; they did not come through the main outlets and they were both in the United States. I believe that one concerns nicotine on a crop called mustard greens—and the other of toxaphene on chard.

We all know by now that most of us at our age contain a certain amount of D.D.T. in our body-fat. The average American has been stated to carry about five parts per million according to the U.S. public health service. The figure quoted in the report on pesticides of the United States President's advisory committee is 12 parts per million. The average figure obtained in the United Kingdom is 2 parts per million. What does this mean? Presumably the only way you can find out what this means is to find people who have in their body fat very much more. We can go, for example, to those who apply D.D.T., to the applicators, and the average for them runs at about between 10 and 20 parts per million in their body fat. We can find extremes in those people who spend their working days formulating insecticides, and there the amount of D.D.T. in their body fat is of the order of 200 with an outside case of 650 parts per million. They were in normal health.

Experimentally therefore obviously the thing to do would be to feed humans with contaminations of D.D.T. which are of the order of 200 times that which they normally encounter in the American diet, and to see what happens to them. Indeed this was done in the state penitentiary at Tallahassee, Florida, by toxicologists of the U.S. public health service, and they found that over a period of 18 months of taking such diets those men remained in perfect health. They accumulated up to about 250 to 300 parts per million of D.D.T. in their body fat after about 10 months, and then, for the remainder of the period, it levelled off because the body was excreting and detoxifying enough to keep it at a stable level. There are other points on this, but perhaps I should not burden you at the present time unless you wish to ask about it.

I suppose that another way of finding out whether pesticides as used are bad for the population is to go to particular areas of our continent where they use large amounts of them, as, for example, the apple-growing regions of Oregon