

problems of accidental poisoning, basically, is not a toxicological one, except perhaps in connection with the development of methods of treating poisoning by pesticides.

It is a matter of public education, and perhaps some regulation of the availability of pesticides, or using better psychology in labeling pesticides. For example, instead of the statement on the label "harmless when used according to instructions", the label might read "harmful *unless* used according to instructions". I understand that some new labeling requirements for pesticides are now being imposed in the United States to provide better protection for the consumer and the general public.

But as far as human health is concerned in relation to pesticides there is in many people's minds a much bigger problem than that of accidental poisoning. This problem looms bigger in some people's minds than in others, but I have the impression that the more one knows about toxicology the smaller it looms. However, the main question involved in this problem cannot be answered by the best informed toxicologist. That is the question of the possible effects of pesticide residues consumed with the food for a life time. Is the population being slowly poisoned? Is there some insidious unrecognized toxic action? Will cancer develop in large numbers of people, or has it developed already from eating pesticides? Is there another thalidomide episode lurking among our pesticides?

It is likely that many people have ingested D.D.T., for example, for as long as 15 years, though we are not aware of any deleterious effect. But, fifteen years is not a life time of a human being and, furthermore, in testing pesticides on animals, we are not certain that the life times of the rat, mouse, or dog are toxicologically equivalent to the life time of man. And even if we agree to assume that they are, we still do not know whether man is more sensitive or more resistant on the long term basis than any of these experimental animals. These questions cannot be answered conclusively on sound scientific grounds in the present state of our knowledge. However, on the basis of our present knowledge we can afford to be optimistic rather than pessimistic. The results of our present methods of toxicologic investigation still give us much confidence as far as the safety of man is concerned. Though much public concern has been generated by uninformed or irresponsible writers about the possibility of a relation between pesticide residues in food and the increase in the incidence of heart disease, cancer, and various diseases of unknown cause, there is still no evidence at all that implicates pesticides as a factor in the cause of such illnesses in the population.

We have been assured by a recent study of the food and drug administration that pesticide residue tolerances are not being exceeded on food in the grocery stores of the United States. These tolerances are established in the first place on the basis of extensive long term toxicity testing in different species of animals, including studies on behaviour, growth, reproduction, life span, function, tissue and cell structure. With the sum total of this information, plus knowledge of the consumption patterns of the foods involved the tolerance is set at a level far below that estimated to produce a deleterious effect. Furthermore, any pesticide which is put into use and achieves practical value in agriculture usually receives continuing attention in toxicologic investigation. Such further studies frequently include the absorption from the intestinal tract, distribution in the body, the manner of excretion, the mechanism of toxic action and the chemical changes which the pesticide undergoes in the body. Information also soon becomes available of the effects on man as the result of incidental exposure in the manufacture or operational use of the pesticide. In some cases very valuable experimental work is done with man himself as the experimental subject. As a result of such extensive studies we know