

One Hundred Years of Entomology And the Future

WITHOUT THE BENEFITS of the past 100 years of research in entomology and insect control and the application by the American public of the knowledge gained therefrom our annual per acre yields of crops and livestock probably would be half or less of those of today. In addition, thousands of our people now living would be dead and hundreds of thousands would be ill from the diseases insects carry.

This statement may seem extreme to those who have paid little or no attention to insect control. But in the light of knowledge of the farmer's problem of much less than a century ago and of the accomplishments of the past decade it is quite plausible. Similarly, the importance of the entomologist to our economy and welfare is not appreciated by most of the general public. Entomology was recognized one hundred years ago as an economically important science—the first state entomologist was appointed in 1854. Yet the men practicing the science have had relatively little recognition during that period.

The concept of the battle of man *vs.* insects for domination of the earth is an old idea that has been glamorized to varying degrees by many speakers and writers. Probably no human has been without personal contact with the insect nuisance. Herbert Hoover contributed a touch of color to the picture recently on his 80th birthday when he commented that the first money he earned came from picking bugs off potatoes.

But the scientists who have been learning and teaching how to fight the insects effectively have been in the background until recently. Since the discovery of DDT almost sensational accomplishment in the killing of insects turned a spotlight on this group, in which the entomologist is the key man. He cooperates with the chemist, the agronomist, the botanist, the plant physiologist, and many other specialists. As this cooperation becomes closer the approach to insect killing is becoming more accurate more scientific, and more effective. It is moving toward direct insect control according to Herbert H. Ross of the Illinois State Natural History Survey who is now president of the Entomological Society of America. In response to our request for Dr. Ross' comment on the next 25 years of entomology he has written the following:

"In the last decade entomologists have found a new weapon of unusual potency in the battle with the insects, that is the array of highly toxic synthetic insecticides. Thus we now have insecticide formulations so toxic that a few drops will do more work than quarts or gallons of some of the older materials. The combination of high insect kill and reduced per acre cost of treatment means not only higher savings on high acre-yield crops, but also that it is now economically feasible to plan chemical con-

trol for low acre-yield crops such as pasture, range, and small grains which formerly were treated only under emergency insect outbreaks. This same group of chemicals gives us the first promising soil insecticides we have ever had for widespread use on foodstuffs.

"I would be surprised if these two potentialities were not extended in the next two decades to revolutionize many aspects of forest management and range and pasture management. In addition they give promise of finally achieving preventive treatment for many pests which are a continuing heavy drain on the high annual value crops such as cotton, corn, and fruit.

"The biggest problems of the next 25 years will without much doubt originate in and develop from the extension of the chemical control efforts. Some of these are on us now—insects becoming resistant to certain insecticides, reduced plant vigor due to certain pesticide formulations, and unexpected and often serious problems arising from disturbance of the ecological balance of the habitat. To solve these problems will necessitate a continuing study of all factors which help us to keep insects to a minimum—ecology, toxicology, even applied evolution (it has already been started!), and the physiology and taxonomy which are their foundation.

"In short, in the next 25 years we may really put some control in insect control. For the word control doesn't mean "kill 'em by the millions"—it means "keep the population level where you want it." Our present day "control" methods are a tacit admission that the insects are out of our control! But as we approach this goal of control, we will find that to get closer to it we need to know more and more about the ecology of food production. Obtaining appropriations to finance this program will be one of the biggest problems the entomologists have encountered.

"The new insecticides of this decade have shown us for the first time the vastness of the losses caused by insects each year, now known to be at least 7 to 8 billion dollars for agricultural products alone.

"These figures are difficult to comprehend. But when people begin to realize that every man, woman, and child in the United States pays nearly \$100 a year to the insects (no deductions for dependents) and that only 30 cents per capita is being spent on research investigations to do something about it, perhaps the problem of financial support won't be so difficult."