

### POISONING RODENTS—AND THEN?

IN a recent Associated Press dispatch I was accredited with the unqualified statement that the grasshopper "plague" of the past summer, in parts of the Middle West, was attributable to the virtual elimination of rodents over large areas as a result of concerted poison campaigns. The error which I wish to correct was the failure to quote my original statement that the occurrence of such plagues of insects is one of the results to be expected from rodent elimination. Every biologist, of course, realizes that the factors determining the occurrence of grasshoppers in unwanted numbers are exceedingly complex. Doubtless there are dozens of partial checks rather than a single controlling agent. If there be added an item favorable to their increase, or if there be subtracted one that is unfavorable, there will be just that many more grasshoppers, but no one can predict with reason whether the increase will be one or a thousand per cent.

Certainly the majority of rodents are partially insectivorous. At least some, and presumably all, of the western ground squirrels are very fond indeed of catching and eating grasshoppers. In the treeless parts of the West where insectivorous birds are scarce it is likely that rodents constitute the greatest active check (as contrasted with parasites, disease and adverse meteorological conditions) with which grasshoppers have to contend. But of course this has not been proven, for no extensive investigation has been made to determine what part rodents play in the destruction of harmful insects.

I venture to state that it is universally believed by biologists that as rodents are now being virtually exterminated over large areas by means of poison, their places will be taken by other, and possibly more destructive, forms of life. In a communication to Senator Walcott during 1930 I predicted that the continuance of a federal policy for the elimination of rodents over enormous areas would result in plagues of insects, such as grasshoppers, and the great increase of certain undesirable weeds. In rebuttal, those desirous of arguing to the contrary will at once point out that plagues of grasshoppers have always occurred, from time to time, in many parts of the world. True, of course. It is merely wished to indicate that after the elimination of rodents from an area plagues of grasshoppers will undoubtedly be more frequent and more severe than formerly.

The experience of certain parts of California, poisoned several years ago with distressing thoroughness, now indicates that to the prediction of insect plagues should be added the likelihood of mouse plagues, paradoxical as this may seem. The explanation of this is probably as follows.

Under modern methods of poisoning the mortality of rodents may approach 100 per cent. and certainly reach the point at which it is impossible for local carnivores to make a living, providing of course, all these have not already been poisoned on their own account. At any rate, those remaining must either starve or emigrate, practically to the last individual. On the surface, then, it seems that all rodents and all carnivores are gone, and everything should be lovely. The insidious point, however, is that within every farm house and barn are a few house mice (*Mus*), and in a number of garden patches, not poisoned out of consideration for poultry, is an occasional meadow mouse (*Microtus*) and deer mouse (*Peromyscus*). These, finding the surrounding country untenanted, radiate and, their natural enemies being absent, multiply prodigiously. Unless other factors are unfavorable, in a few years there will be a mouse plague, more damaging to the farmer than if the status quo had been maintained. So, as a sequel to extensive poisoning of rodents (California alone has used over 14,000,000 pounds of poisoned grain and 6,000,000 of carbon bisulphide in the last 10 years) in its present thoroughness we may expect an increase in grasshoppers and more mouse plagues. But rodents do an enormous amount of damage and must be controlled where too destructive. The solution seems particularly clear. Rodents should be rigorously dealt with precisely where damage is being inflicted, and they, with their natural enemies, left alone as completely as practicable on waste land or where little loss is being suffered. Above all, no effort should be made entirely to exterminate rodents over wide areas, even when the process is couched in a less harsh and more soothing term than that of "extermination."

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### TREATMENT FOR POISONING BY "POISON IVY"

THE poison in *Rhus toxicodendron* and other poisonous species of *Rhus* is in the form of an oil. Dissolving the oil and throwing it away before it has time to be much absorbed into the skin is the logical treatment and is completely effective, if used promptly, and is a help even after the skin lesions are well developed. Prepare a hundred or more pinches of absorbent cotton. Use a small saucer of alcohol, 70 per cent. to 95 per cent. strength. Change the alcohol frequently. Dip a small pinch of the cotton in the alcohol and with it sop up the poisonous oil that may be upon the skin and then promptly throw it away. Do not allow any drying of the alcohol. For a small patch of the poison repeat the procedure fifty times or so. At first do not rub, but