

crop than he would have done had the birds been absent. This, I think explains the absence of severe grasshopper outbreaks in the districts referred to.

There are very few birds that do not take advantage of a locust outbreak. Grouse find the insects especially palatable and several people are now learning to associate abundance of grasshoppers with the rearing of large families of grouse and this undoubtedly applies to several other birds.

It is, however, to those birds which congregate into flocks that we must look to most for help. I have already mentioned gulls in this respect, another is found in the crow. The crow is very fond of grasshoppers at any time and as the evidence shows, feeds its young largely upon them when they are sufficiently numerous. Indeed it is no exaggeration to state that a family of six crows would consume at least three bushels of grasshoppers in a season which would mean preventing about 9,000,000 of the insects' eggs from being laid.

In our grasshopper campaign of 1920 we ran across many instances of crows gathering in locust areas for feeding purposes. They were especially noticeable along roadways where fence or telephone poles afforded convenient resting places for their sentries. There is probably another reason for the crows gathering along roadways which is explained as follows: The outbreak of locusts referred to was made up of several species of which two were of special importance. These interestingly enough, have a marked difference in their choice of breeding sites, the one known as the Lesser-migratory locust choosing stubble fields or areas of semi-cultivation for egg-laying while the other, known as the Road-side locust, (*Camnula pellucida*) prefers the grassy road-sides for breeding purposes. On account of this habit the last-named insect is naturally massed within a comparatively small space which the crows have learnt to take advantage of.

Returning to the contention that birds frequently neutralize their usefulness in destroying noxious insects by eating the parasites at the same time, we have here at least a case where that was not so to any marked extent. Parasites of adult grasshoppers have been of small importance owing to their scarcity. Egg parasites, however, give far greater promise of eventually bringing the insects under

control. Here then we have a case where the destruction of adult locusts by birds will reduce the possible egg supply and oblige the insect feeding upon them to gather upon what remain, thus giving a far greater assurance of reducing the pest quickly.

I will conclude with one more example which, though not conclusive, provides at least strong circumstantial evidence in favour of the birds involved. Some twelve miles from my home at Treesbank, Man., is a pretty little village surrounded by hills and trees, where crows have bred rather freely in the past. A few years ago, however, prominent citizens of this place came to the conclusion that the crows were greatly reducing the bird life, especially game birds, which the citizens looked upon as their own special privilege to kill. In consequence of this belief, these people inaugurated crow-destroying competitions in which they formed sides of equal number, those bringing in the greatest number of crows and their eggs winning a prize, which the losers had to pay. The result of this annual competition in crow destruction has had a marked effect upon crow life in the vicinity without apparently producing very noticeable results in the direction expected. What interests us here, however, is this. The district, which is a grain-growing one, was infested by a severe and isolated outbreak of grasshoppers last year, while surrounded areas where crows had been protected escaped. As I said above, this may be a coincidence, but since the region is no more suitable for grasshoppers than others nearby, such would hardly seem to be the case.

In the preceding remarks no effort has been made to plead the cause of birds, the evidence has merely been given as it was presented to me in the field. I have said nothing of the aesthetic side, yet few can depict anything more beautiful than a flock of gulls following a ploughman, flying with their graceful curves within a few inches of his head and darting down with a characteristic little flutter to pick up the insect newly exposed. To see them flying over the lakes is equally pleasing, and we ought surely to be thankful in realizing that such perfect creatures are our friends. This can be said with almost equal justice of many other birds, which, if they are not as pleasing to look upon, make up for that by a sweeter song or some other characteristic which should endear them to us.