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VOL. XXVIII.

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No. 9.

LIST OF TACHINIDÆ FROM THE PROVINCE OF QUEBEC.*

BY J. D. TOTHILL.

The following list contains 49 species of Tachinidæ from the province of Quebec. A number of the species were captured at Ottawa, but as this place is only separated from the province of Quebec by the Ottawa river, it is certain that all these species must occur in the neighbouring portions of Quebec and for this reason it seems advisable to include them in the present list.

It is certain that this list represents only a very small proportion of the Tachinidæ that must occur in this large province. Many of the most common species, for instance *Tachina mella* Walk. and *Frontina frenchii* Will., do not appear in the list. This means that collectors in this province, either amateur or professional, would be well repaid by turning their attention to the group.

The list has been compiled from two sources: (1) the collection of the Entomological Branch at Ottawa, and (2) records contained in literature. In the case of records from the former source the precise locality is stated and this is followed by the collector's name in parenthesis. In the case of records from the latter source the name of the person responsible for the original record is given; in all cases where the record appears in Aldrich's Catalogue of N. A. Diptera (1905), reference is made to the original publication containing the record. The references are made by a letter index.

The majority of the species in the present list were originally recorded by Mr. G. Chagnon in his "List of Canadian Diptera" which appeared in the *Entomological Student*, Philadelphia, Vol. II, 5-8 and 13-15; and by Dr. T. W. Fyles, in his "Quebec Diptera," which appeared in the *Canadian Entomologist*, XXXV, p. 234, August, 1903. These records are embodied in Aldrich's "Catalogue," so that in the present list no specific reference has been made to the above two papers.

*Contribution from the Entomological Branch, Department of Agriculture, Ottawa.

The order adopted is that of J. M. Aldrich.

Cistogaster immaculata Macq. P. Q.—Fyles (a).

Gymnosoma fuliginosa Desv. Montreal—Chagnon (a)
Ottawa, (Col. by W. Metcalfe).

Alophora ancoventrif Will. Ottawa, (Col. by J. D. Tothill).

Alophora diversa Coq. Montreal, (Col. by Beaulieu)—Gibson (c) 1911, p. 17.

Alophora magnipennis Johnson. Ottawa—J. Fletcher (b).

St. Hilaire, P. Q., (Col. by Beaulieu)—Gibson (c) 1911, p. 17.

Alophora nitida Coq. Sherbrooke, P. Q.—Aldrich (a).

Cryptomeigenia theutis Walk. Montreal—Chagnon (a);
Ottawa, (Col. by A. Gibson).

Eulasiona comstockii Town. Chelsea, P. Q., (Col. by J. Fletcher).

Admontia degeerioides Coq. Montreal—Chagnon (a); Ottawa,
(Col. by J. Fletcher).

Clausicella johnsoni Coq. Ottawa—J. Fletcher (b) 1906,
p. 102.

Hypostena variabilis Coq. Montreal—Chagnon (a); Ottawa,
(Col. by W. Metcalfe).

Polidea areos Walk. Montreal—Chagnon (a).

Æstrophasia calva Coq. Ottawa—Harrington (b) 1902,
p. 101.

Cyrtophlæba horrida Coq. Montreal—Chagnon (a); Ottawa,
(Col. by W. Metcalfe).

Plagia americana Van der Wulp. Ottawa, (Col. by A. Gibson).

Ocyptera dosiades Walk. Montreal—Chagnon (a).

Varichæta aldrichii Town. Ottawa, (Col. by A. Gibson).

Linnæmyia picta Meig. Rigaud P. Q.—A. Gibson (b) 1911,
p. 17.

Exoristoides harringtoni Coq. Ottawa—Aldrich (a).

Exorista chelonæ Rond. Chelsea, P. Q., (Col. by J. D. Tothill).

Exorista eudryæ Town. Ottawa, (Col. by J. Fletcher).

Exorista futilis O. S. Ottawa, (Col. by J. Fletcher and A. Gibson).

Exorista nigripalpis Town. Ottawa, (Col. by J. Fletcher);
Chicoutimi, P. Q., (Reared at Ottawa from larvæ of *Tortrix fumiferana*);
Maniwaki, P. Q., (Col. by A. Gibson and G. E. Sanders).

Exorista pyste Walk. Chicoutimi, P. Q., (Reared at Ottawa
from larvæ of *Tortrix fumiferana*).

Exorista vulgaris Fall. P. Q.—Fyles (a); Maniwaki, P. Q.,

(Col. by A. Gibson and G. E. Sanders): Chicoutimi, P. Q., (Reared at Ottawa from larvæ of *Tortrix fumiferana*); Ottawa, (Col. by H. Groh.)

Phorocera lophyri Town. Ottawa—Aldrich (a).

Phorocera saundersii Will. Ottawa, (Col. by J. Fletcher).

Frontina tenthredinidarum Town. Ottawa, (a).

Sturmia albifrons Walk. Ottawa, (Col. by J. Fletcher).

Sturmia inquinata V. d. W. Ottawa, (Col. by A. Gibson)

Sturmia nigrita Town. Rigaud, P. Q.—A. Gibson (c) 1911, p. 17.

Masicera eufitchiæ Town. Ottawa, (Col. by A. Gibson).

Masicera myoidea Desv. Ottawa, (Col. by C. H. Young). Meach Lake, P. Q.,—J. Fletcher (c) 1907, p. 21.

Tachina simulans Meig. Ottawa, (Col. by W. Metcalfe); Montreal—Chagnon (a).*

Tachinomyia robusta Town. Ottawa, (Col. by J. A. Letourneau).

Blepharipeza adusta Lœw. Ottawa, (Col. by A. Gibson).

Blepharipeza leucophrys Wied. Meach Lake, P. Q., (Col. by A. Gibson).

Winthemia quadripustulata Fab. Ottawa, (Col. by W. Metcalfe and Bro. Germain).

Metachæta helymus Walk. Montreal—Chagnon (a). Ottawa, (Col. by A. Gibson).

Phorichæta sequax Will. Ottawa, (Col. by A. Gibson).

Gonia capitata DeGeer. P. Q.—Fyles (a); Ottawa, (Col. by W. Metcalfe and J. Fletcher).

Spallanzinia hesperidarum Will. Montreal—Chagnon (a).

Cuphocera fucata V. d. W. Montreal—Chagnon (a).

Peleteria prompta Meig. Montreal—Chagnon (a); Ottawa, (Col. by A. Gibson); Aylmer, P. Q., (Col. by H. Groh.)

Archytas analis Fab. Montreal—Chagnon (a); Ottawa, (Col. by J. Fletcher).

Echinomyia algens Wied. Quebec—Van der Wulp (a); Ottawa, (Col. by J. Fletcher and A. Gibson).

Echinomyia florum Walk. P. Q.—Fyles (a).

Saundersia signijera Walk. Montreal—Chagnon (a); Ottawa, (Col. by W. Metcalfe and J. D. Tothill). Dr. Fletcher, in 1904, reported the species as "unusually common at Ottawa" (b) 1904, p. 78.

Bombyliomyia abrupta Wied. Quebec—Van der Wulp (a);

*In Aldrich's Catalogue of N. A. Diptera this species is recorded from Ottawa, and, for the record, reference is made to Coquillett's 'Revision' p. 119. In this 'Revision' the only Canadian locality given is Toronto so that an error has evidently been made in transcription.

Montreal—Chagnon (a); Meach Lake, P. Q., (Col. by A. Gibson); Ottawa, (Col. by J. Fletcher).

Literature cited:

(a) Aldrich, J. M., Catalogue of North American Diptera, 1905.

(b) Reports of the Entomological Society of Ontario.

(c) James Fletcher and Arthur Gibson. "The Entomological Record" to 1912.

BOOK NOTICES.

THE HOUSE-FLY, *MUSCA Domestica* Linn. ITS STRUCTURE, HABITS, DEVELOPMENT, RELATION TO DISEASE AND CONTROL. By C. Gordon Hewitt, D. Sc., F. R. S. C., Dominion Entomologist. Cambridge: at the University Press, 1914. Price 15 shillings net.

This book of 382 pages which has just been received, is undoubtedly the most comprehensive and complete volume which has yet appeared on the extremely common insect, which is abundant, unfortunately, everywhere, *viz.*, the House-fly. No insect of late years has received such world-wide attention as has the species here discussed. This, of course, has been owing to its relation to the spread of disease. The book is not intended as a popular treatise on the subject, but it has been prepared largely for the use of entomologists, medical men, health officers and others who would be interested scientifically in the matter presented. The volume is divided into six parts, *viz.*, Part I—The Structure and Habits of the House-fly; Part II—The Breeding Habits; Life-history and Structure of the Larva; Part III—The Natural Enemies and Parasites of the House-fly; Part IV.—Other Species of Flies Frequenting Houses; Part V—The Relation of House-flies to Disease; Part VI—Control Measures. Three full page coloured plates and 104 text figures illustrate the volume. Students of the subject, everywhere, will welcome the appearance of this important book. It will undoubtedly be a valuable work of reference for many years to come.

BIRD HOUSES AND HOW TO BUILD THEM. In view of the interest which is now being taken in the protection of our native insectivorous birds in various parts of Canada, the United States Department of Agriculture, Farmers' Bulletin No. 609, bearing the title, "Bird Houses and How to Build Them", will prove of much interest. This bulletin of 19 pages, prepared by Mr. Ned. Dearborn, Assistant Biologist, discusses briefly many forms of bird houses, nesting boxes, etc. Food shelters are also described. Forty-eight illustrations are given.

COMMISSION OF CONSERVATION; FIFTH ANNUAL REPORT.
This very useful report was recently issued.

In his annual address, the Chairman of the Commission, Hon. Clifford Sifton, discusses the Commission's activities with respect to waters and water-powers, minerals, public health, agriculture, fisheries and fur-bearing animals and forests, indicating clearly and succinctly a number of the problems that had been grappled with and the advances that had been made in their solution.

Several articles appear in the report which are of special interest to naturalists. Mr. J. Walter Jones treats in detail of the progress in fur-farming in Canada during the past year. The work of the Committee on Fisheries was confined, during 1913, chiefly to the development of the oyster industry. Hon. A. E. Arsenault describes the new method of leasing oyster beds in Prince Edward Island. This method was advocated by the Commission two years ago, and will do much to regenerate the oyster industry in the Maritime Provinces. An exceedingly interesting paper on the "Protection of Migratory Birds" is given by a leading American authority, Mr. W. S. Haskell, who urges Canada to join with the United States in providing sanctuaries for these birds.

Considerable advance has been made in the conservation of forests during the year. The Commission has co-operated with the Board of Railway Commissioners and the several provincial and Federal forest services concerning the prevention of forest fires, with the result that much has been done to prevent forest fires along railway lines, especially in Western Canada. In addition to the report of the chief forester, Mr. Clyde Leavitt, there are addresses on forestry by Dr. B. E. Fernow and Mr. R. H. Campbell.

The report contains a number of splendid illustrations and gives in concise form much information that is of value to all Canadians interested in the conservation of our natural resources.

MEETING OF THE BOTANICAL BRANCH.

The Botanical Branch held the first of its bi-monthly winter meetings at the residence of Mr. R. B. Whyte, on Saturday evening, November 14. The meeting was in charge of Mr. W. T. Macoun, Dr. M. O. Malte, and Mr. G. H. Clark. There were also present the following members: Messrs. Attwood,

Ami, Buck, Criddle, Davis, Fryer, Gibson, Macmillan, Newman, Tully and the host, Mr. R. B. Whyte.

The subject dealt with was "Possibilities for Home Grown Seed in Canada" with particular reference to root and vegetable crops.

Mr. Macoun in opening the discussion stated that both Mr. Clark and Dr. Malte, as well as himself, had already given the subject considerable attention, having prepared articles, etc., for the press in which attention had been drawn to the point that there was a strong probability that shortages of certain seeds would be felt in Canada for at least the two following seasons, owing to the fact that Germany and France, the regular sources of supply, would not be able to fill orders as heretofore.

Summarizing the pros and cons of the case for Canadian grown seed, and other interesting points relating to the plants the seed of which, could or could not be grown to advantage, it was noted that (1) Home grown seed often produced more vigorous plants; (2) earlier fruits; (3) the suitability of localities for certain crops was an essential factor; (4) the question of the high cost of labour militated somewhat against home production; (5) about one dozen of the important plant families were represented by the most important of the popular garden and field vegetables; the asparagus and onion for instance, representing the Lily family; (6) nearly all of the present vegetables have been cultivated for a long time, and in some cases it was possible to trace modern species to a common origin. The modern cabbage, kale, and cauliflower were known to have come from one original type. Mr. Macoun in closing, again referred to the question of proper locality and stated that while he thought certain seed, like that of melons, might be produced most profitably in sections of the country, like British Columbia, yet he felt confident that in time most seeds now raised in Europe could be raised to advantage in Canada.

Dr. Malte dealt more particularly with forage roots such as mangels, turnips and sugar beets. He pointed out that the original wild form of such root crops consisted of a creeping form found on the sand of the coastal regions of Europe. This, without doubt, accounted for the fact that such crops possessed a liking for alkali soils and flourished in coast districts. In raising beet seed it must be kept in mind that different varieties cross fertilize very freely. Mangels too, in most cases were not yet fixed in types. When swedes and white turnips are grown side by side, it has been found that cross fertilization will influence the resultant roots, and that as a result many malformations of the roots follow. In some instances such malformations have been mistaken for the effect of Club Root.

Plasmodiophora brassicæ.

From certain experiments which had been carried on at Yarmouth, N. S., it has been found that excellent seed of roots can be grown there. Eleven hundred pounds of seed per acre is about the average for mangels.

Mr. Clark discussed the methods adopted by the seedsmen in buying and distributing seed. He also stated how it was that seed-growing in such places as Waterloo County, Ontario, came to be started in Canada some years ago. It was a result of judicious help given by the federal Government. He further pointed out the fact that the sub-vention offered this year by the Government should help in the production of more home grown seed. The last few years over 1,200,000 pounds of mangel seed have been imported into this country, each year, much of which might be grown here. The subject provoked considerable discussion by the members.

F. E. B.

THE VALUE OF SOME MAMMALS AND BIRDS AS
DESTROYERS OF NOXIOUS INSECTS.*

BY NORMAN CRIDDLE.

In these days of specialization, we are apt to overlook the close relationship that other classes or orders hold in the economies of nature. Yet, as our work proceeds we find that its scope must of necessity be widened to take in, at least, an elementary understanding of other things. The student, for instance of lepidoptera will find it necessary to learn something of botany so that he may recognize the various plants acting as unwilling hosts, or being fertilized through the agencies of the insects visiting them. He will also require some knowledge of hymenopterous insects and of diptera, which in their larval life sometimes live as uninvited guests within the caterpillars.

Then again, there are the birds and mammals which often play a not unimportant part in the control of insect outbreaks. As these last seldom receive their due in entomological journals, I have decided to select them for my theme, trusting that the outcome will not prove altogether without interest.

In the year 1913, being busily engaged in the task of collecting June beetles (*Lachnosterna* spp.) for breeding purposes, I had occasion to visit nightly a favourite locality for those insects, the time being from dusk to midnight. Here, lantern in hand, I examined the various trees for specimens and often sat watching the insects' habits, collecting such individuals as seemed desirable.

*Contribution from the Entomological Branch, Department of Agriculture, Ottawa.

It was not long before I became aware that I was not alone in my searches, and soon it was discovered that another, equally keen in collecting and more expert in discovery, was keeping me company.

To begin with, this companion was only suspected by strange noises among the bushes, but one night hearing the usual snapping of twigs and characteristic *jump, jump*, among the leaves, approaching nearer, I waited silently out of sight, and then what should appear within a few feet, but a fully mature female skunk. She was startled, as I flashed the lantern light into her face, and made off, but afterwards, in the course of a few weeks we became more friendly, and I was privileged to watch her work. It was interesting too, to see how she jumped at the clumsy, buzzing beetles, either knocking them down with her front feet, or securing them before they had time to rise. Of course, I only saw her now and then, and that was generally while I was sitting or standing still, but I gained sufficient insight into her ways to see that she made a very fair meal of the beetles, and that without very much trouble. From the fact that she came back nightly, for several weeks, I fancy she too recognized the value of the vicinity as a collecting ground.

Later, when the beetles had vanished for the season, she still returned frequently. Now, however, paying all her attention to the grubs, which in searching for she seemed just as successful as she had previously been with their parents, though I was obliged to dig haphazardly to gain the same ends.

This was, by no means, my first experience with skunks as destroyers of insects, but I had never before watched one so closely in the field or realized how much good they could do. Since then I have had occasion to come into close contact with their work as destroyers of white grubs on a number of occasions, to say nothing of their love for grasshoppers, upon which they turn most of their attention during the summer months. As soon as the grasshopper season slackens, however, they return once more to the white grubs and continue feeding upon them until the insects, feeling that winter is approaching, make their way below the skunks' reach.

On a field near Aweme, Manitoba, badly infested with white grubs, two or more skunks were in the habit of visiting each evening to make their customary meal. One of them was probably my old friend, while the others doubtless constituted her family. I only saw odd individuals once or twice, but the evidence of their work was unmistakable. Here over an area approximating eight acres, were found little holes, without doubt the work of skunks. They usually only went to a depth of a few inches, but that was sufficient for the purpose. Making

an estimate of the number of holes to a square yard, I found these to approximate slightly more than three. Supposing that each hole represented a white grub, and there is little doubt about this, then the total grubs destroyed, to an acre, would be 14,520. That is to say, 116,160 in the eight acres. To anyone not accustomed to skunks' habits, the discovery of white grubs under ground many seem questionable, but not to those who know, as a matter of fact these animals collect practically all their food by scent.

Naturally skunks, like many other animals, do some harm by eating useful insects, in fact they will even relish a *Calosoma* beetle. They also destroy some birds' eggs and occasionally raid a poultry house, but their value cannot, I think, be questioned.

Writing of white grubs reminds me of another enemy they have to contend against and that is our old and cheery friend the robin. In the east robins are industrious workers on our lawns, the food they seek there being largely earthworms. In Manitoba, however, and westward to the Rockies, earthworms are scarce, but in places at least, there are lots of white grubs, which though located below the ground are, as a rule, discovered with comparative ease by the robins. How they manage it I do not know, but that they do so I have seen demonstrated on a number of occasions, when a small flock made a badly infested field their daily feeding ground before the breeding season commenced.

Flickers and crows also rank high as white grub destroyers in late May. The former, however, do not trouble themselves so much about white grubs when other insects, such as grasshoppers and ants, are available.

It is, however, by following the plough and picking up the grubs exposed that the work of the crow ranks highest. In the open wooded districts preferred alike as breeding places by crows and June Beetles, one will often turn up the grubs in large numbers, but in my experience seldom in quantity too numerous for the birds following the plough. A flock of twenty-five or more crows following diligently behind in the furrow, have been my companions through many a day's ploughing in early summer, while in their company were the usual blackbirds and grackles, all occupied in the same task.

A little friend of mine, with, I am sorry to say, a bad name, is also very evident, I refer to the cowbird, with whom, in cheerful impudence, there are few to compare. They have no more fear of sitting upon an animal's back to pick off the flies than they have of running beneath one, or being shoved out of the way by its nose. As destroyers of grubs, they are excellent,

but do not eat the larger ones when smaller are available, instead merely squeezing their heads as if desirous that they should be killed at all events.

These are the ploughman's more constant company, but occasionally he will have a graceful flock of gulls as his guests—voracious feeders upon every insect exposed, and a large flock will soon devour all specimens in sight.

In my personal experience, however, I have found crows to be by far the most persistent in their search for insects. They will literally live and feed their young upon cutworms from a badly infested locality, locating the grubs by means of the upheavals so characteristically left when one is working near the surface. Another favourite diet is made up of army-worms when present. During a local outbreak near my home, in 1913, I found that of all birds, crows were most in evidence at this time (August). As is well known, crows in autumn generally collect into large flocks, often of many thousands. One such flock, estimated at 3,000, visited the army-worms daily, particularly when they were crossing a road. Several infested fields were also located by the crows' guidance, the birds having forsaken all other food and flown several miles to partake of these caterpillars. The birds remained on the fields for some weeks after the larvæ had pupated, undoubtedly picking up these latter from beneath clods of earth, etc., which they are experts at turning over and habitually do so in search of insects. How many army-worms a flock of 3,000 crows would devour in two weeks, I will leave my readers to judge.

In describing some of the good qualities of crows, I do not wish it to be thought that I thus acquit them of all crimes. The crow is often a thief, helping himself to a farmer's corn, as readily as he will to eggs or young poultry when opportunity offers. To those of us who have watched his habits carefully, however, the good deeds seem to far outweigh the bad. And, therefore, I include him as an undoubted friend.

Another type of birds, frequently overlooked as destroyers of insects, but preserved at certain seasons on account of their food value and the sport they supply to hunters, are the various species of grouse.

To those who have lived in their breeding areas, it is noticeable that the yearly increase of Prairie Sharp-tailed Grouse (*Papediacetes p. campestris*) in the prairie provinces fluctuates from year to year, the variation in numbers, apart from the devastation caused by gunners, being largely due to the food supply, the food in question consisting chiefly of grasshoppers.

Observation shows that an outbreak of locusts is nearly always followed by the successful maturing of a large number

of young grouse. Hence, apart from the evidence acquired through the examination of stomachs, we are led to believe that the young subsist very largely upon such insects. They do not, however, by any means confine themselves to locusts. Caterpillars having smooth skin are consumed, from the largest sphinx larva, to cutworms, army-worms, etc.

As the season proceeds, however, the diet of the Sharp-tailed Grouse changes and while they still regard insects as luxuries, they now turn their attention to various grains, particularly wheat, which they occasionally damage to a small extent, though the damage as a rule does not extend over more than a month, while the injury itself consists of the birds resting upon the stooks and picking out the grains from the heads. By far the greatest portion of the grain eaten at this time, however, is gleaned from the ground, being waste material, and therefore of no value. This grouse is also troublesome sometimes before harvest, when it learns to break down the stems of grain to get at the heads. It is conceivable that if very numerous they might cause considerable damage by this habit, a contingency that does not seem likely to occur, however, under present conditions. They are also objected to occasionally by farmers through choosing one of their fields for a "dancing" ground in the spring months, when perhaps half a hundred males will collect for their morning and evening manoeuvres, thoroughly trampling down an acre or more of land.

Of course, all these little depredations are insignificant when compared with the birds' usefulness as destroyers of noxious insects, and their value for food purposes.

The Pennated, or Square-tailed Grouse (*Tympanuchus americanus*) is another with habits very similar to those of the Sharp-tailed. It, however, chooses the open country for its home, whereas the latter prefers open woodlands.

The food habits of the Ruffed Grouse (*Bonasa* sp.) are much more in question than those of the species mentioned above, for while they undoubtedly devour many caterpillars and other noxious insects during summer time, they feed very largely upon buds in winter, often almost stripping trees, particularly those of poplar, besides badly damaging lilacs and other shrubs. It may be said, however, that the buds eaten are usually flowering ones which in poplars are larger than leaf buds, thus the trees suffer to a comparatively small extent. This argument cannot be used, however, in the case of lilacs, which should be protected by wire netting.

Naturally such injury is confined to the vicinity of woodlands which are the birds' natural homes. Probably the summer food taken fully compensates in value for the damage

done in winter time, but more definite evidence is required to make sure. Of course, the bird is much relished as food and on this account alone is well worthy of being preserved.

There is one thing that may be said in regard to the status of birds as destroyers of insects. A great many useful insects are very minute and would thus escape detection. Others have stings or look so like bees or wasps as to readily pass for them. On the other hand a great many pests are large, such as orthoptera and lepidoptera and are thus more likely to attract attention. Of course, a bird in seizing a grub may unwittingly destroy half a hundred parasites and so do harm, on the other hand it may go further and kill hyperparasites which prey upon true parasites.

There is no doubt that many bird lovers go too far in their claims of bird usefulness just as some entomologists go to the other extreme in minimizing their usefulness. As a matter of fact many of our worst pests are hardly influenced at all by birds. I may cite as an example the Hessian-fly, and other small insects. It is also generally a mistake to consider birds of first importance in the suppression of severe insect outbreaks. They doubtless help, the cases cited above being a few examples, but they are far behind predaceous and parasitic insects in such work. Their aid, however, is far greater when pests exist in normal numbers. Then, by keeping them so, by picking off the surplus, they are accomplishing much in retaining the balance of nature.

NOTES ON THE QUAIL.

A reference to quail in Mr. Saunder's article in the October issue on bird preservation, noticed during an enforced confinement to the house, is responsible for these few items about the doings of a very gallant little gentleman. The remarks are only scientific in being accurate, but spending each winter on a club property of some hundred thousand acres in South Carolina, with a naturalist for a manager, a crowd of observant darky guides, and a changing group of guests, talking game and game habits every evening, *Colinus virginianus* has become a familiar friend.

Our American Quail, so called, is an Englishman in his courtesy to his woman kind, his bulldog fighting powers and his clinging to customs, that, in a new country with progressive neighbors, might well be changed. He takes his turn sitting on the eggs; if weather conditions are favorable to a second brood, fosters the first chicks until the two bebies unite into the families of twenty odd that sometimes gladden our eyes,

and, it is said, should the better half be taken away, never remarries. A hen quail just outside the Oakland house fence was eaten by a rattlesnake. The cock remained there, single, two seasons, although charmers in quantity piped their notes a few hundred feet away.

An abundance of quail in a suitable country depends on four main factors—food, cover, water and, probably, grit. This last is important only in a delta section like Oaklands, where a morning search after a pebble for rasping a turkey call ended in breaking up a scythe stone; and food might perhaps be modified to winter food. Bevies with us do not break up before May, and they find then a plentitude of grass and insects everywhere. During the winter months in the south, quail live principally on pine mast, but lespedeza, "benny" wild helianthus, in fact any suitable sized weed seed, is acceptable.

On plantations lately grazed by cattle, birds practically disappear—no cover.

Quail can stand a *short* cold spell, with snow, better than many other genera. They roost always in a close circle, heads out, in patches of low stubble, and remain there, dormant, until the weather improves or starvation scatters them.

Artificially increasing stock is a fascinating but little understood subject. It is only within a year or so that hatching in confinement has succeeded at all. The mere dumping of unmated birds in pairs or quantity seems a waste of time. At Camden thousands of quail were imported from the west without permanent results, and we ourselves have often tried the thing on a smaller scale.

Beyond dispute, at the beginning of the breeding season, the strongest cock left by the sportsmen drives away all rivals, whistles a mate provided he is a young bird, and then, with the tenacity of the anglo-saxon, pre-empts such territory, be it one or twenty acres, as seems necessary for the welfare of his family, defending this while life lasts against all trespassers. The writer firmly believes that by judicious planting and observance of the other conditions, his majesty will be contented with merely enough land to secure happiness, leaving the extra room gained for new comers. But much better authorities say not, he wants what his father, grandfather, and great grandfather owned. Certainly at the Oakland Club we find, year after year, only the same bevies, though food has been provided, vermin trapped and a breeding stock carefully preserved.

What comes of the vast surplus thus driven away is an enigma. Quail are undoubtedly migratory in the small isotherms between northern and sub-temperate regions. Probably

these southern birds drift north to fill the areas depleted by snow, but nobody knows.

It seems cruel to kill quail when so many less interesting and useful game birds exist, but the harder, in reason, land is shot over, the better. Otherwise the parent birds live to become barren, or one only of the original pair dies by accident. Districts that never see a gun, deteriorate and a single healthy young bird alive at the beginning of the mating season means a full sized brood at that place in the autumn. In Europe, however, eggs are taken from one nest to another, to provide change in blood.

Cats and cur dogs are the worst enemies. As farmers learn to appreciate the good birds do, it may become illegal to own or harbor pussy.

D. B.

ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO, 1914.

SOME PERSONAL IMPRESSIONS.

To one who has not previously taken part in gatherings of that character, the meeting of the Entomological Society of Ontario held at Toronto, Nov. 5th and 6th, were of unusual interest. To begin with, there was the mixing with kindred spirits from all parts of the country, not forgetting our neighbors and co-workers from the south; for in the broad realms of science boundaries present little significance and those in its pursuit come as near to the ideal of universal brotherhood as any class I know of. This mixing, then, of men from all parts having similar aims, was by no means the least profitable of the proceedings and certainly not the least enjoyable.

To me, of course, many of the faces were new, though the men were in other ways old friends. It would be difficult to enlarge upon the characteristics or qualities of some without neglecting others equally worthy of note and yet it would be equally impossible to enumerate all in this short paper. I will, therefore, briefly touch upon a few picked out almost at random from those who were present.

Mention should first be made of our worthy President, Dr. Hewitt, who presided over the meetings, and whose presidential address, an exhaustive account of the rise and progress of Economic Entomology in Canada, was much appreciated by the audience. Dr. Bethune, an old and prized correspondent, and Dr. Fyles, another veteran, were present, the latter presenting a paper entitled "Mountains and Hills," written in his

usual characteristic style and read in a manner which many of our younger generation might imitate to advantage. Prof. Comstock, fittingly described by our President as the father of modern entomology, delivered the public lecture, his subject being "The Habits of Spiders," and delighted his listeners by a magnificent collection of lantern slides displaying the web-spinning characters of various genera and species.

Prof. Lochhead, another old friend to all who have read the Annual Reports of the Society, enlivened the meetings by many a cheery remark, besides presenting us with matter of a more serious nature. An address that will long be remembered was his light touches and extracts from the works of the famous French naturalist Fabre. Professor Casar provided both papers and spontaneous material characteristic of the man and of undoubted value to the farming community. Among his contributions may be mentioned "An Imported Red Spider Attacking Fruit Trees" and "Cherry Fruit Flies"

Nor must I leave out my colleagues in the Entomological Branch, Messrs. Gibson and Swaine. The former's paper, entitled "Outbreak of the Army Worm in Canada in 1914", in which the writer depicted the insect's habits and showed that its depredation amounted to a loss approximating \$300,000, was listened to with much interest, and in company with a paper by Mr. A. W. Baker, of the Ontario Agricultural College, entitled "The Army Worm in Ontario," was the prelude of a lively discussion.

Another paper by Mr. Gibson, entitled "Locust Control in Eastern Canada," was also of special interest to the writer of these notes.

Mr. Swaine's contribution on "Forest and Shade Tree Insects on the Farm," contained a special warning to citizens to be on the watch for pests now making their way towards our borders. He also gave an interesting talk upon Forest Insect Conditions in British Columbia.

In the discussion that followed the reading of all these papers, most of the members took part, and in this connection I would specially mention Prof. Crosby, of Cornell University, Prof. Brittain, of Truro, N.S., Father Leopold of Oka, and Messrs. Chapais, Dearness, Ross, King, and Hudson. The remarks of whom, together with the various papers, will appear in due course in the Annual Report of the Society, which should be in the hands of all interested in entomology.

Lastly, there was the smoker at our headquarters, of which only those who were present could form an adequate idea of its interest. Nor must I forget the hospitality of the Toronto branch who, headed by Dr. Walker, did much towards making the meetings a success.

N. C.

THE OTTAWA FIELD NATURALISTS' CLUB.

PROGRAMME OF WINTER MEETINGS.

November 23rd, 1914, (Monday), open meeting. Exhibits and Addresses by Members. (Normal School Assembly Hall).

December 8th, 1914, (Tuesday). "The New Zealand Peripatus—The most ancient and wonderful of living animals." (Illustrated with living specimens). Prof. E. E. Prince, Dominion Commissioner of Fisheries, Ottawa. (Normal School Assembly Hall).

January 12th, 1915, (Tuesday). "The Royal Botanic Gardens, Kew." (Illustrated with lantern views). Prof. R. B. Thomson, Botanical Laboratory, University of Toronto. (Normal School Assembly Hall).

January 26, 1915, (Tuesday). "The Indians of the West Coast." (Illustrated with lantern views). Dr. Edward Sapir, Department of Anthropology, Geological Survey, Ottawa. (Normal School Assembly Hall).

February 9th, 1915, (Tuesday). "Fossils." (Illustrated with lantern views). Mr. L. D. Burling, Geological Survey, Ottawa. (Carnegie Library Assembly Hall).

February 23rd, 1915, (Tuesday). "Milk." (Illustrated with lantern views). Mr. J. H. Grisdale, Director Experimental Farm, Ottawa. Carnegie Library Assembly Hall).

March 9th, 1915, (Tuesday). "Some Interesting Canadian Birds." (Illustrated with lantern views). Dr. M. Y. Williams, Geological Survey, Ottawa. (Carnegie Library Assembly Hall).

March 23rd, 1915, (Tuesday). Annual Meeting and Presidential Address. "The Habits of Insects in Relation to their Control." Mr. Arthur Gibson, Entomological Branch, Department of Agriculture, Ottawa. (Carnegie Library Assembly Hall).

Meetings commence at 8 p.m.

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