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THE OTTAWA NATURALIST

VOL. XXV.

OTTAWA, JANUARY, 1912

No. 10

POPULAR ENTOMOLOGY.

THE ENGRAVER BEETLES (FAMILY IPIDÆ).

BY J. M. SWAINE, Assistant Entomologist, Division of Entomology C.E.F., Ottawa.

Beetles of the Family Ipidæ have been described from almost every portion of this continent from Mexico to Alaska, and will probably be found wherever their food-plants occur. Many species are described from the West Indies, and a very large number from Central and South America, and from Europe. Many are known from Japan, Australia, Ceylon, South Africa and elsewhere. A few species seem almost world-wide in distribution; others are known only from small regions. A number of species, e.g., *Eccoptogaster rugulosus* and *Xyleborus dispar*, have been introduced into America from Europe.

The North American members of the family Ipidæ are usually somewhat elongate and cylindric in form, and brown or black in colour. They vary from one to a little over eight millimeters in length. *Crypturgus pusillus* is one of the smallest species, and *Dendroctonus valens* probably the largest. The legs are rather small and weak, as becomes their habits. The antennæ are short and geniculate, with an extremely large club, which is usually annulated. The vast majority of the Ipidæ cut their breeding tunnels in the bark or wood of trees or shrubs. The chief North American exceptions are referred to below.

Their burrows are of great interest, and often of remarkable regularity and beauty. Those of many species are so characteristic that it is often easy to determine which species has been at work from an examination of the tunnels and galleries alone.

A large portion of our North American species infest coniferous trees, the pines and spruces being especially subject to attack. Of deciduous trees, the oak, beech and hickory suffer severely, and there is scarcely a northern tree but serves as food-plant for one or more species of this family. As a rule

each species has a limited number of food plants, but some, like *Pterocyclon mali*, feed in many trees, both coniferous and deciduous.

According to their habits, the North American species of *Ipidæ* may be separated into four fairly well-marked groups: the Bark-beetles, the Timber- or Ambrosia-beetles, the Twig-beetles, and a fourth group containing a few species of varying habit.

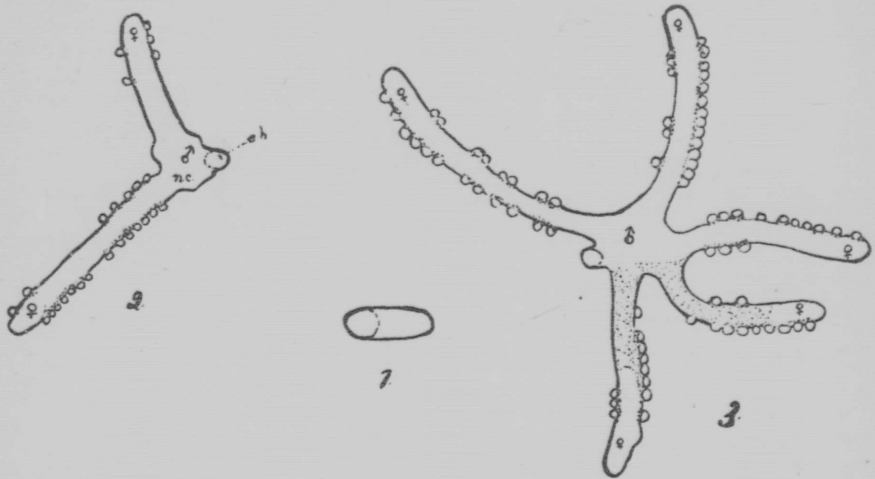
THE BARK-BEETLES.—The first of the above-named groups includes those forms which burrow in the bark, or between the bark and the wood. The adults enter through a hole in the bark, cut in many cases by the male, and drive a primary-tunnel between the bark and wood, usually partly in the bark and partly in the wood, and frequently either parallel with or at right angles to the wood-fibres. A few species burrow entirely in the bark, and others, included here in the Bark-beetles, cut their tunnels just below and parallel to the wood surface. The length of the tunnel varies in the different species from less than an inch to more than a foot. The female does the greater part of the work, while the male guards the opening and removes the chips and refuse. These main-tunnels are usually kept strictly clean. In sweeping the tunnels the beetles move backwards, scraping the refuse with the mandibles back to the fore legs, which pass it on to the middle, and these to the hind pair. When the opening of the tunnel is reached the tip of the abdomen is protruded and the refuse passed up to the hind pair of legs in the manner just indicated, and by the hind legs pushed away from the opening. In cutting the tunnels the beetles constantly revolve, and thus obtain such perfectly cylindrical burrows.

When not at work the male beetle is usually guarding the entrance. By backing into the entrance-hole the declivity of the elytra plugs the opening, and thus presents a complete protection from many enemies.

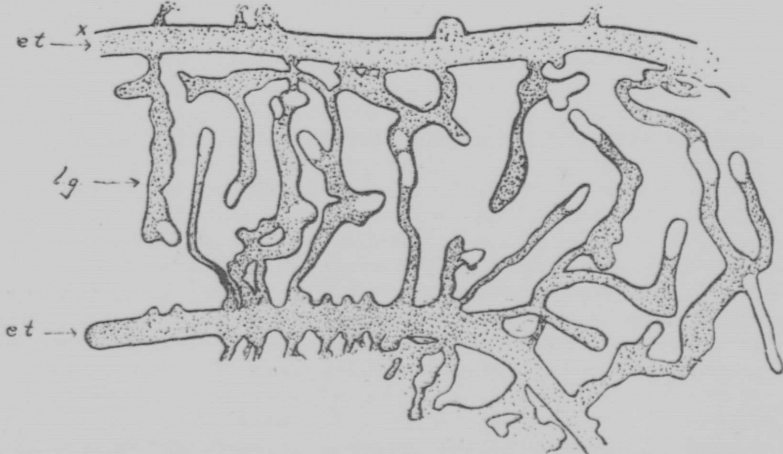
In niches along the sides of the primary-tunnel the whitish, almost transparent eggs are laid, usually one, though sometimes several, in each niche. In some species, *Ips caelatus* and *Dendroctonus simplex*, several eggs are deposited in large niches; while others, *Hylurgops pinifex* and *Dryocoetes autographus*, arrange the eggs in rows along the sides of the tunnel.

When egg-laying is completed the adults of some species die, and their remains may frequently be found long after in the tunnel. Some species, however, cut a new tunnel and rear a second brood.

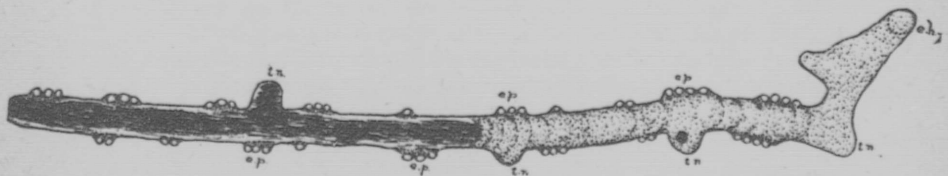
In those species which lay the eggs in masses along the sides of the primary-tunnel, the larvæ burrow in congress through the



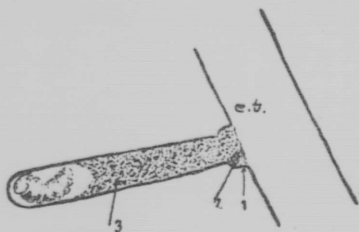
Tunnels of *POLYGRAPHUS RUFIPENNIS* Kirby, in spruce bark. Three stages in the development of the egg-tunnels.



DENDROCTONUS SIMPLEX Lec. Development of larval galleries; larvæ half-grown: e.t., egg-tunnels; l. g., larval galleries.



DENDROCTONUS SIMPLEX Lec. An egg-tunnel showing egg-pockets, e. p., containing eggs; turning-niches, t. n., and entrance-hole, e. h.



IPS BALSAMEUS Lec. Development of larval gallery: 1, egg-niche; 2, egg-packing; 3, excrement of larva; e. t., egg-tunnel.



IPS CAELATUS Eichk. Under side of bark, showing the eggs in the pockets.

bark, forming irregular cavities extending laterally from the primary-tunnel.

When the eggs are laid in niches the larvæ burrow separately through the bark or between the bark and the wood, at right angles to the primary-tunnels; these side tunnels, larval galleries, or mines, thus formed increase in size as the larvæ grow, and are left completely filled with wood or bark fragments which have passed through the body of the larvæ. The latter feed entirely upon bark or wood.

If the direction first assumed by the larvæ is not parallel with the wood-fibres, the larval-mines are usually found to turn, tending to follow the direction of the fibres. The larvæ at and near the ends of the primary-tunnel swing around almost immediately, while those nearer the middle do so as rapidly as is possible without encroaching upon the mines of their neighbours. Usually the larvæ keep carefully to their own preserves, only crossing a neighbour's gallery when necessity compels them to do so. When the larval mines are entirely in the bark their direction has no definite relation to that of the wood fibres.

After the larval development has been passed, varying in length with the species, the ends of the larval mines are enlarged and sometimes driven down into the wood to form the pupal chamber. In some species the pupal period lasts but a week, or ten days, in others the winter is passed in this condition. After transformation is completed, the young adults cut their way out through the bark, forming the openings known as "shot-holes".

While the primary-tunnel and also the egg-niches are usually engraved in the wood, the larval-mines are often entirely in the bark, or only cut the wood at the pupal-chambers. On ash trunks, where the bark is thick, the larval-mines of *Hylesinus aculeatus* but slightly engrave the wood surface, while on small branches, where the bark is thin, the mines often cut the wood as deeply as they do the bark.

Frequently a number of primary-tunnels, cut by different females, radiate from a common "nuptial-chamber" situated just beneath the common entrance-hole. In such cases, with some species, the male cuts the entrance-hole, the nuptial-chamber and often the beginnings of three or four primary-tunnels. The male is then joined by one or more females, which finish the primary-tunnels and the egg-niches; the work of the male, after the entrance of the females, consists mainly in removing the chips and refuse and guarding the entrance-hole, as already mentioned.

When the primary-tunnel is long, as is the case, *e.g.*, with several species of *Ips* and *Dendroctonus*, there may be one or more "ventilation holes" through the bark.

Before egg-laying begins, whether for the first or second time, the beetles cut "food-tunnels," either beneath the bark of the host-tree or in the bark of twigs or trunk of other trees. Many species cut their food-tunnels as continuations of the larval galleries, and hibernate therein.

In Eastern Canada most Ipidæ hibernate as adults, though with many species larvæ and pupæ also occur beneath the bark in the winter.

(To be continued).

ACCESSIONS TO CANADIAN BOTANY—I.

BY EDWARD L. GREENE.

There is before me a small collection of plants which, although in quite too fragmentary specimens, is more than ordinarily interesting in view of the locality from which it has come, namely, a part of extreme north-western Yukon, not far below the Arctic circle, and a region not before touched by any collector. In the interior of the Alaskan peninsula there is a great empire of territory somewhat elevated, and extending far on both sides of the international boundary, which is almost unexplored botanically, and which promises many revelations to the student of plant geography. Many years ago there was submitted to me a small collection from the Porcupine River region, a good part of which showed a flora distinct enough from that of the coastal districts of Alaska, and as totally unlike that of the farther interior south-eastward.

The fragments now at hand from the Canadian side of the boundary, collected in the summer of 1911, by Mr. D. D. Cairnes, have intensified the desire for a more careful investigation

of that whole domain of inland Alaska. The following plants of Mr. Cairnes appear to be new; the first, a rather remarkable generic type belonging to the family of the crucifers.

MELANIDION.

Low perennial herb, with stout suberect branches racemously floriferous throughout and subsecund. Sepals equal, narrowly oval, persistent even under the mature fruit. Stamens, six; subequal; filaments slightly flattened; anthers oval. Petals equal, the limb cuneate-obovate, obtuse, tapering to a short claw, the color, purple. Style manifest and stout; stigma capitate. Silicle firmly coriaceous, subcompressed, suborbicular, the body strongly double-convex, but the valves meeting by flattened margins forming a thick wing-like elevation all around, and dehiscent through this wing or ridge; the whole one-celled, the partition obsolete. Seeds, 1 to 4, oval or round-obovate, not much flattened; cotyledons accumbent.

MELANIDION BOREALE. Leaves unknown, as also the root and the absolutely basal part of the plant. The branches, the rather long pedicels of the fruits, and the middle of each sepal are all whitened by a villous pubescence. The calyx is wholly of a very dark purple, yet quite herbaceous as to texture. The specimen is very mature, only a few of the corollas remaining at the summits of two of the racemose branches. Most of the silicles had shed their seeds. The valves are straw-colored, also reticulate-veiny both without and within. The type is of so strange appearance and character that I am unable to name any genus to which I should say that it is nearly allied.

The locality, as given by Mr. Cairnes, is "North of Runt Creek, Long. 141°, Lat. 66° 18', the altitude 2,300 feet."

ANEMONE CAIRNESIANA. Leaves at time of flowering, small; barely half-inch long and not much broader, ternately cut into many oblong acutish lobes and glabrous, but the petioles loosely villous; scapes stoutish, only two or three inches high, leafless, but with a conspicuous involucre of three leaves at about the middle, each divided into about three narrowly oblong or oblong-linear segments, each somewhat callous at tip, all glabrous above, beneath clothed loosely with long, somewhat appressed silky hairs; peduncle of the solitary flower whitened with a villous woolliness at and near the summit; perianth very large for the plant, measuring $1\frac{1}{2}$ to $1\frac{3}{4}$ inches across in expansion, the sepals oblong, seven or eight in number, and of a deep slightly purplish blue; filaments still more deeply purple, the anthers elliptical and blackish; styles in the flower rather prominent, pubescent; fruit unknown.

This very beautiful new anemone Mr. Cairnes obtained from two localities in the region, the first specimens are from somewhere north of the Orange Fork of the Black River, Long. 141°, Lat. 66°, 10', the land having an altitude of some 2,000 feet. These were taken on 21 June, 1911. Other specimens, and these the best, are from between Teecat and Runt Creeks, the altitude 3,000 feet, and were gathered 26 June. This is perhaps the most beautiful of American species of the genus, and the blue color of the flowers is remarkable. I gladly dedicate the species to Mr. Cairnes. Viewed as a whole the plant bears some suggestion of *Pulsatilla*; but the perianth is rotate, and from what I see in the pistils as they exist in the flower, I am confident the fruit when known will be shown to be that of genuine *Anemone*.

POPULAR AND PRACTICAL ORNITHOLOGY.

II.—THE MARSH HAWK.

BY NORMAN CRIDDLE.

The range of this hawk covers approximately the whole of North America. It breeds throughout the northern portion of the continent, wherever the geographical conditions, more particularly those relating to water and flora, are suitable. These conditions being intermittent wood and open country, preferably mixed with low land containing swamps or marshes, though these latter are not essential in the choice of a breeding site. In winter time it confines itself to the more southern half of the United States.

The Marsh Hawk is at once distinguished from all other hawks by the wide and clear cut white band at the base of its tail, a distinction that is not possessed by any other kind. It may also be easily told by its method of flight and manner of hunting. There has, however, been some difference of opinion about the colour phases of these birds. Some people with a knowledge of ornithology claim that they have seen individuals of the same coloured plumage nesting together as male and female, while the majority agree that the colour phases are merely sexual, the slaty grey bird being the male and the brown individuals females. This latter is my experience, and I have come in contact with many pairs covering a period of nearly thirty years. All have answered to that description. The young birds, however, are all of their mother's dress though somewhat brighter coloured. It is quite possible that a few individuals retain this first plumage for another season, par-

ticularly if the bird has suffered some illness or is retarded through other causes, just as a caged bird seldom acquires full summer vestiture. Apart from this it seems to me to be just as unreasonable to expect to meet with constant individuals of that class as it would be to find robins masquerading in the dress of their mates, either male or female.

In their home life, that is when they are breeding, Marsh Hawks usually select some low-lying ground though it may be many miles from water. Thus, choosing a situation usually among low bush, or at least where the trees are not very close together, they commence to build a nest chiefly of small sticks and stems of grass, the latter being used more particularly for lining. This nest is generally a bulky affair placed upon the ground. I have found them among willows close to water, also among low aspen poplars, or even tall ones, in situations by no means appropriate to the bird's name. My experience is that they prefer open prairies intermixed with bluff and marshes, though when the latter are not available they adapt themselves to the former. I have never, however, found a nest on high land away from some sort of trees. If undisturbed these birds will return to their old haunts year after year, though choosing each season a new situation on which to place their nest. It is interesting to watch them while they are seeking for a nesting site. They seem first of all to decide upon a locality, then flying to and fro looking over every inch of the ground, they gradually determine upon the actual spot. During this period of selecting and building, the male, as well as helping in the work, indulges in many antics for his mate's edification; the chief one being to turn summersaults. These acrobatic performances are most interesting. He usually starts with a sort of wobbly flight as if imitating a tipsy individual, then swooping downwards, he turns completely over, occasionally several times in succession and then darts up again with a cackle to repeat the same performance over again, often tumbling within a few feet of the female which is usually flying below. Occasionally these performances are terminated with the wobbly flight over again, at other times they neither start nor end in this manner. I have also observed the female try her skill in the same way but she lacks the confidence and grace of her husband. These birds also often utter shrill cries, more particularly when two males are present; they also sometimes fight, specially the males.

During the breeding season the hen seems to keep very continuously on the nest while her lord replenishes the larder. At such times he may be seen flying low around bush and field in search of gophers or mice, though a small bird, too, does not come amiss. If you were in the vicinity of the nest you would

see him return many times, but seldom without a rodent in his claws. The eggs are pure white and rather rough in texture on the surface. I have found them to vary in numbers from four to seven. The young, as with all our birds of prey, hatch in rotation, as the eggs are laid, so that they are of different ages. They are odd little fellows at first, all fluff, with large heads, but they very soon learn how to claw and hiss.

Several theories have been advanced as reasons for the hatching of young at different times. The chief advantage, however, seems to be that of protection, especially with birds of prey. The first born soon learns, not only to protect itself, but its younger brothers and sisters also, as I have more than once witnessed; indeed they are regular little demons as they throw themselves upon their backs and use their claws vigorously. They will also readily hop to the rescue of a younger companion and are thus a means of defending the whole family against any intruder, be it skunk, badger, or coyote. The mother, too, is a fearless defender of her brood and is by no means to be trifled with; indeed her daring on some occasions would, I believe, lead to serious scratchings did one offer an opportunity. In this respect the male is far less bold and contents himself with making faint dives, taking care to keep well out of reach.

The food for the young is collected by both parents and they are careful to pluck or skin everything before offering it to be eaten; they also carry away all tell-tale bones, etc., so that there is no unnecessary odours to attract enemies. The young, too, as soon as they are able, move away from the nest, and by the time they are nearly fully fledged may be discovered several hundred feet away, and when at last they learn to fly they are often widely separated and are to be seen resting upon some fence rail or upon the bare ground. At this period the parents can be seen teaching them to catch game for themselves, the exercise consisting of dropping a ground squirrel or some other animal and enticing the young to catch it before it reaches the ground, the lesson being repeated until proficiency is attained. After this they are instructed in field work, and soon learn to hunt for themselves.

I am not, however, of that school who believe the young only acquire proficiency through the parents teaching. It unquestionably helps, but I believe a young bird would still acquire the instinctive habits of its progenitors, supposing them to be separated, at a very early age. This seems to me particularly borne out by the habits of the young when they first learn to hunt for themselves, in making, as it were, a speciality in seeking grouse. This they unquestionably do and from August till the middle of September are one of the worst enemies our prairie

chickens have to contend against. Of course, only the young chickens are captured and they at this time are only partly fledged and, therefore, by no means strong on the wing, consequently they fall an easy prey and make an excellent meal. They are captured as they rise and before they have time to acquire speed. As they become older they naturally get stronger and the hawks learn from experience that the grouse are no longer available for food, and so devote themselves to smaller, but more easily captured prey; having once learnt the lesson they appear never to forget it, and in future like their parents adapt their tastes to rodents and small birds, though occasionally an old bird will attack and capture a partly grown grouse or even domestic fowl. To me this habit seems a remnant of bygone days, a revival of an older instinct when the birds' feet were better adapted for capturing big game. This is no isolated instance; many animals can be traced backwards through the habits of their young, which in later life they loose.

Marsh Hawks are expert hunters. They may be seen at all times of the day, but especially late in the afternoon, skimming low over the ground in search of their favorite food—gophers and mice; they also seem to know that those rodents are more often to be met with round the edges of cultivated ground, as they are often seen to follow a field right around.

As the season advances into October, gophers become scarce and the hawks in consequence, are obliged to depend more upon mice and small birds, and it is while after the latter that they show their greatest skill, beating every bush as they go along, first one way and then another. Those bushes encircling the edges of fields being particularly attended to as it is in such that small birds congregate. The patience and assiduity these hawks show at this time is remarkable to behold, and one cannot help admiring their skill, though feeling all the time for the hunted.

In Manitoba, Marsh Hawks reach us from the south towards the end of March and leave again for warmer quarters in late October and early November. They usually arrive singly, the males coming first, followed in a few days by the females.

I have already indicated the general food habits and it is therefore sufficient to add that a thorough examination of stomachs at Washington, fully bears out the evidence as supplied from field observation. Marsh Hawks unquestionably do some harm, by destroying immature grouse, this is particularly so of the young; they also occasionally help themselves to young poultry, but this latter habit is seldom indulged in. On the other hand they devote by far the greater portion of the season to hunting rodents such as gophers, chipmonks and mice, all

enemies to the agriculturist; and, therefore, justly weighing the good deeds against the bad, leave, I think, much in the birds' favour and show it well worthy of protection.

THE STATUS AND DEVELOPMENT OF CANADIAN ARCHAEOLOGY.

(Abstract of a paper presented by MR. HARLAN I. SMITH, Victoria Memorial Museum, Ottawa, before the American Association for the Advancement of Science, Washington, D.C., Dec., 1911).

The archaeological work of the Geological Survey since June 15th, 1911, the date of Mr. Smith's appointment as Dominion Archaeologist, has been divided into two main groups—the activities for diffusing archaeological knowledge by such means as museum exhibits, guide books and lectures, and those for increasing such knowledge as by exploration, original research and systematization.

The national collections have been classified tentatively into groups corresponding to the five ethnological culture areas. This grouping may be modified with the progress of research. The collection from the southern coast of British Columbia and the one from the southern interior of British Columbia are representative, and the collection from Ontario is large. The other provinces of the eastern woodlands, the plains and the arctic are hardly represented at all, and in fact our knowledge of them is almost nothing. Popular guides have been prepared for the two western archaeological areas and work is progressing upon similar guides for the others. A series of lantern slides illustrating the archaeology of Ontario has been made; general and topical labels for the collections are in the hands of the printer; duplicates of these will probably be furnished to other museums throughout Canada, and with duplicate specimens, casts and photographs when supplied to these museums will make the archaeological work truly national.

An archaeological survey of the Dominion is being organized and a reconnaissance has been made of some of the village sites in Ontario.

A survey of Brantford township has been completed by Mr. W. J. Wintemberg. A system for systematizing and digesting the scattered and incomplete archaeological data at hand and to be received in the future has been established. The co-operation of railroad officials, the North West Mounted Police, Indian Agents and geological explorers has been secured.

It is proposed to explore the less well known parts of Canada beginning with intensive exploration at one site in each of the great cultural areas that the results in the way of collections and monographs may be used as standards to which to refer for identification the results of future exploration obtained in bordering areas where we may expect to find mixed or superimposed cultural material.

It is planned in the near future to make a reconnaissance of the plains from which there is practically no material to-day available, to continue scientific exploration into the northern interior of British Columbia using the Grand Trunk Pacific as a base, and to do an intensive piece of excavation along the St. Lawrence. Next, the shell-heaps of the Atlantic coast may be examined.

THE YELLOW BREASTED CHAT AND THE CAROLINA WREN IN ONTARIO.

BY W. E. SAUNDERS, LONDON, ONT.

Until June, 1909, when the writer walked from Amherstburg to Blenheim in the endeavor to outline the distribution of some of the more southern birds in Ontario, the only record of the summer residence of the Chat in Ontario, outside of Point Pelee where it breeds regularly, was that in McIlwraith's book of a pair having spent the summer near Hamilton.

The undertaking of 1909 developed the fact, that the birds were to be found in single pairs at two or three places along the southern border of western Ontario, the farthest east being near Renwick, which is about five miles north of Lake Erie, and perhaps twenty miles north-east of Point Pelee.

I am now permitted to record the apparent nesting of a pair near London in the summer of 1911. The bird was first seen by Messrs. C. Watson and M. Dale, on May 22, in a wood about six miles west of London, which is a favorite haunt of the Cerulean, Mourning, Golden-wing and Chestnut-sided Warblers, and the Blue Gray Gnatcatcher, and, also, consequently of our local ornithologists. In this wood on the early morning of the 22nd of May, the above mentioned gentlemen heard the call of the Chat; fortunately they had both visited Point Pelee with the writer earlier in the month when they became acquainted with this bird for the first time, so that when the note was heard, they realized the prospect ahead of them, and therefore they stuck to the job until the bird was well seen. Since then they have visited the locality four times, the last of which was on

July 1st, and each time the bird was either seen or heard, or both, so that there can be little doubt that it is breeding there. In consequence of a trip to Alberta which occupied all of June, the writer has not yet had an opportunity of visiting the spot, but hopes yet to see the bird before the opportunity is gone. There can be little doubt that this species is spreading through the west end of Ontario, which is the case with the following species.

The Carolina Wren has a little the start of the Chat as far as Ontario is concerned, although the addition of the bird to our fauna took place at a much later date, the first specimen being taken by Mr. L. H. Smith, at Forest, Ont., in February, 1891. After that it was not reported for the Province until the present contingent of visitors began to go to Point Pelee in 1905, where it was found that the bird was quite common.

On the walk previously referred to, the Wren was found scattered through the west end of the Province in only slightly greater numbers than the Chat, but it has been reported from many more districts and three have been seen and heard right around the city of London, one of which in the spring of 1910 looked like a probable breeder, but the opportunity to prove this did not occur. A pair spent a couple of summers at St. Thomas, between April, 1905, and the winter of 1906-07, and a sufficient number of single notes have been made for various parts of the west end of Ontario to satisfy anyone that the bird nests in scattered places irregularly over the whole west end of the Province.

GOSSAMER SPIDERS.

It is curious to note how certain insects anticipated man in some of the activities and achievements on which he prides himself. The wonderful social organization of the ants, with their soldiers and slaves, their roads and tunnels, their domestic animals and fungus gardens, was doubtless in existence when our paleolithic forefathers were waging a dubious warfare with the cave bear and the sabre-toothed tiger. Wasps were macerating wood fibre into pulp and spreading it out into paper untold ages before the first whiff of sulphite fumes reached Major Hill Park, while another group—the mud-daubers—by stinging a captured spider so as to paralyze without killing him outright and thus preserve him as food for their larvae, may be said to have forestalled in a way our modern methods of cold storage. As for the bees, perhaps in the far future we may be able to

eliminate our drones as effectively as they do theirs. And man's latest triumph, the conquest of the air was long ago consummated by the spider. It is true that the little spinner's flying thread is at the mercy of the wind, and is not susceptible of direction like the aeroplane or the dirigible, but still it enables him to travel astonishing distances with ease and celerity.

In the last week of September, 1911, an immense number of "gossamer" spiders appeared in the district around Arnprior. Every fence in the town and for at least five miles out into the surrounding country was streaming with the exceedingly tenuous lines of the little weavers. The threads, which were from about 5 ft. to 20 ft. long, were so fine that they would only be seen when the sun glanced on them at a certain angle, but when the eye caught them they looked like long ghostly hairs blowing out in the wind. Examination showed that nearly all the threads were anchored by one end to the fence rail or wire, and that the spiders were running about actively, but in a somewhat aimless manner. But here and there one of the little line-weavers still had the thread attached to his spinneret, and with his head to the breeze, which was so gentle as to be scarcely perceptible, allowed the thread to float out behind him. Presently he raised himself as high as possible on his tiptoes, at the same time elevating his abdomen until he was almost standing on his head. This seemed to be done to try if the thread waving behind him in the wind was sufficiently long to float him, and if its pull was not strong enough, he apparently spun out a little more. After raising and lowering himself several times in this manner, he suddenly let go his hold on the fence and floated quickly away on the end of the line, taking a course at an angle of about 45° with the horizon, and in a few seconds was out of sight. Who can say how far he went? Darwin in "The Voyage of Beagle" records large numbers of such aeronauts sixty miles at sea off the coast of Patagonia. Those the writer observed took a course S.E. Perhaps they reached the St. Lawrence or even entered the United States.

It was formerly thought that this "ballooning" was peculiar to one species which was called the "gossamer" spider, but it is now alleged to be common to the young of many different species including several distinct families. Some spiders are said to spin out three or four diverging threads onto the breeze, but those the writer saw were contented with a single line each.

CHARLES MACNAMARA.

BOOK NOTICE.

NEW ENGLAND TREES IN WINTER, by A. F. Blakeslee and C. D. Jarvis. Storrs Agricultural Experiment Station, Storrs, Conn., Bull. No. 69, June, 1911; pp. 307-576.

This extremely useful bulletin has recently been received. Field-naturalists will especially value this publication, and as the work is limited the edition will doubtless soon be exhausted. The authors, however, are republishing the bulletin in book form. School teachers, students of botany generally, as well as those interested in forestry will gladly welcome this ready means of distinguishing trees in winter. In the order of the arrangement of the species in the text and the scientific names, Gray's New Manual of Botany (1908), has been followed. In the "Introduction" the different terms used in the bulletin, are discussed. Beginning on page 344, the various species found in New England are treated of. The even numbered pages are devoted to an account of the trees, opposite to which are beautiful half-tone reproductions of particularly good photographs, each plate illustrating the whole tree, the trunk, twigs, etc. The illustrations of the twigs and of the fruit of the deciduous trees are very nearly natural size. Each tree is discussed under the sub-headings, "Habit," "Bark," "Twigs," "Leaves," "Buds," "Fruit," "Comparisons," "Distribution," and "Wood." These descriptions of each species are all on the one page opposite to which are the illustrations as above mentioned. Pages 329 to 343 are devoted to a "Key to Genera and Species," and pages 564 to 567 to a Glossary.

The printing, illustrations and general arrangement of this publication are most excellent, and the authors and those associated with them in the preparation of the same are to be congratulated. This work is undoubtedly one of the best, if not the best, publication of its kind that we have seen. It will give untold pleasure not only to students of botany and those interested in forestry, but also to all nature lovers, who are fortunate enough to secure a copy.

A. G.

NEW MEMBERS.

At the last meeting of the Council of the club, the following gentlemen were elected members:

MR. H. GIBSON, Ottawa

MR. FORSTER, Ottawa

NOTES.

FISH CULTURE IN CANADA.—Hatching fish by artificial means to stock the waters of Canada is engaged in on a large scale by the Dominion Government. In 1909, the Dominion fish hatcheries planted no fewer than 1,024,282,000 fry in various waters throughout the country. In 1900, only 271,996,000 fry were planted by the Government fish hatcheries, so that the plant of young fish has increased by nearly 277 per cent. in the past ten years and the number of hatcheries has increased from 12 to 37, or 208 per cent. Of the 37 hatcheries now in operation, British Columbia and Quebec have 8 each, Nova Scotia, New Brunswick and Ontario, 5 each; and Manitoba and Prince Edward Island each have 3.

The amount voted by the Dominion Parliament for fish culture purposes in 1909 was \$322,300, and of this \$180,345, or approximately 56 per cent. was expended. The importance of carrying on this work can not be emphasized too much in a growing country like Canada, where the increasing population is making greater and greater demands on the fish supply. (Bull. No. 8, Dec. 30, 1911, Commission of Conservation, Ottawa).

FORESTRY CONVENTION.—Arrangements are now rapidly approaching completion for the Annual Convention of the Canadian Forestry Association which will be held in the Railway Committee Room, Parliament Buildings, Ottawa, on February 7th and 8th, 1912. The gathering is under the patronage of His Royal Highness, the Governor General, and a number of distinguished men, both from Canada and the United States, have promised to attend and take part. As the subjects to be discussed are of the most practical and pressing character, it is expected that there will be a very large attendance of all persons interested in our forest resources.

Among the subjects to be discussed will be: the separation from politics of the various forest services of Canada by placing them under civil service regulations; the consideration of what constitutes a fair appropriation for the maintenance and development of forest reserves in Canada; federal versus provincial control of forest lands; and the most effective forms of legislation for the suppression of forest fires in organized and unorganized territory and along railway lines. Discussion on the last named will arise upon the presentation of the Report of the Committee on Forest Fire Laws. This Report was prepared for submission to the Quebec Convention of 1911, but owing to lack of time it could not be reached.

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