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THE OTTAWA COLONY OF CHIMNEY SWIFTS *(CHÆTURA PELAGICA).*

By A. G. Kingston.

(Read 29th January, 1891.)

Among the many different physical powers exhibited by animal life in its endless variety of forms there is none which has so much impressed the mind of man in every age as that one so widely characteristic of the feathered class, the gift of flight. In the systems of the ornithologists a bird may take higher or lower rank according to the development or simplicity of its internal structure; but in the eyes of mankind at large, let but the power of rapid and untiring flight be shown in a high state of perfection, and just in that measure will its possessor approach the ideal bird. Throughout the whole class there are few, if any, families which in this respect can rival the Swifts.

The Albatross and the Frigate Bird can indeed sweep over immense stretches of ocean in an hour's time, but, after all, the sea and the earth enter largely into the life of these birds. Their food is sought amid the waves, their nests are placed among the rocks along shore; but the home of the Swift is in the upper air where he delights to spend every moment of the long summer days. By him every function of life, except sleep and the incubation of the egg, is performed upon the wing; and every organ of the body, as we shall see, is specialized to fit it for this purpose, almost to the disregard of all others.

In most parts of Eastern Canada and the United States the Chimney Swift is one of our most common city birds, often an uninvited guest within our houses and spending the short summer nights within a few feet of our beds.

Here in Ottawa every stroller upon Parliament Hill during the pleasant evenings in spring, and again in the later summer months, is amused by the merry twittering and rhythmic whirling motion of that countless cloud of little birds circling round one of the towers of the Government Buildings. And in the height of summer no better example can be found of the power and grace of motion than to see one of these same swifts, after soaring for some time high in the air, descend and, hurrying along just over the roofs of the houses, wheel once or twice about the chimney where his nest is hung, and suddenly arresting his onward motion, with wings raised high above the back like a shuttlecock, drop down into the darkness. This habit of theirs of nesting in chimneys, it may as well be admitted, seems at first to detract much from their claim to an etherial nature as dwellers in the air, but it should be borne in mind that the swift never makes his habitation amongst soot and smoke, for he is always careful to choose a chimney that is not in present use. Moreover, in the days when the human lord of this continent was living in a wigwam filled with soot and smoke, the home of the swift was the shaft of a tall and hollow tree.

The *Cypselidæ* or Swifts are a family of swallow-like birds of medium size and generally of dull plumage. In the classification of the older ornithologists, on account of many superficial points of resemblance, they were closely associated with the true swallows; and as popular language even in the present day applies the name "swallow" indiscriminately to all those birds of graceful flight which live on insects caught upon the wing, it may be well to consider for a moment the reasons that have led to the modern classification; for now while the swallows are closely linked with the finches, tanagers and other singing birds of the Passerine order, so unlike them externally, the swifts on the other hand are placed in a distinct order and as intimately coupled with a family of entirely different appearance, the humming birds. For a vindication of what seems at first an unnatural classification it would be hard to find anything more satisfactory or conclusive than the words of Prof. Garrod as quoted in Cassell's Natural History. At the same time they will give us a glimpse of the internal structure of the swifts which may serve to explain some of their curious habits. I give them in abridged and somewhat modified form :

'Most of us know that unlike the hair upon a quadruped the feathers of a bird are not distributed evenly over the body, but grow in linear clusters, called *tracts*, with narrow naked spaces between. A similarity of the arrangement of these feather tracts in different species has been found to be closely associated with that general similarity of the important organs of the body which leads to the grouping of species together under one order, while the different orders frequently show different patterns in this respect. Now the arrangement of the feather tracts on the swift is found to be almost identical with that of he hummingbird, while the swallow shows an entirely different pattern, closely resembling that of the finches.

'Again, the breast-bone, or sternum, is a bone of great importance in all flying birds, as it gives origin to the powerful muscles which move the wings. Here, too, the swift and the hummingbird show a similar model, the swallow and the finch another.

'The swallow is not a singing bird, yet upon dissection, the syrnix, or origin of voice, at the lower end of the windpipe, is found in one of its most highly developed forms, as in the true songsters. Ages of disuse do not seem in this instance to have caused a degeneration of the organ. Upon the swift and the hummingbird, on the other hand, no reproach can be cast for neglect of musical talent. In them the syrinx is of an entirely different and much simpler form.

'The foot of a swallow is, though comparatively small and feeble, that of a true percher. It is covered with *scutella*, or scales, and has the power of moving the hind toe independently of the other toes; this is indispensible for the grasping of a perch. The swift's foot, unlike that of all other birds, is covered with smooth skin. The hind toe is lacking in the power of independent motion, and in some of the genera is turned forward alongside the others, instead of having an opposing action like a thumb. Accordingly the posture of a swift when at rest is either clinging to a vertical surface or squatting flat upon a level one; whereas, a swallow may often be seen perching on a twig or wire.

'Lastly the swifts and hummingbirds have ten primary feathers in the wing and ten in the tail, while the swallow and the singing perchers have only nine in the wing but twelve in the tail.'

For these reasons, then, among others, the swifts have been removed from their old proximity to the swallows, and grouped with the hummingbirds and the goatsuckers, or nighthawks, under an order called the *Macrochires*, or long-handed-ones, in allusion to the great length, comparatively, of the outer joint of the wing, corresponding to the hand in man.

The Cypselidæ are world-wide in their distribution, species of one or more of their six genera being found in every continent and in Australia, all remarkable for their wonderful power of flight and for their excellence as architects. Their styles of nest-building are very various indesign, but there is one characteristic running through all which distinguishes their nests from those of all others birds. Owing to the extreme weakness of the feet and to the great length of the wings these birds are excessively awkward in any situation but their native element, the upper air. They cannot build of grass, feathers or hair mixed with mud as so many other birds do. To collect the materials would be difficult to weave them together impossible. Neither can they nest upon the ground—a common alternative, especially with non-perching birds. get him on a solid, level surface and the swift is almost helpless. He flounders awkwardly about until he can launch himself over the edge of a rock or bank, and spread those long wings again on the free air. But if nature has condemned this race to make bricks without straw, she has herself shown them how to provide a substitute, and that from a most unique source. The whole family are gifted with an unusual development of the salivary glands which in nesting time secrete within the mouth a thick viscous fluid. Of this material, wholly or in part, the nests of all the various species of swift are composed. On exposure to the air it soon dries into a glue-like substance, hard, light and elastic. So tenacious is it that in removing the nest of our own North American species from a chimney the very brick itself will often come away in scales before the nest will break. Thus equipped these children of the air are almost independent of the earth, and can fix their homes and rear their young in the most inaccessible places, far from the dangers of this lower world.

In Ceylon and the islands of the Indian Archipelago several species of the genus *Collocalia* fasten their little saucer-shaped egg-baskets against high over-hanging cliffs, or on the walls of caverns running in from the sea. These furnish the famous Salangane, or edible birds-nests, so dear to the heart of the Chinese epicure. The best samples, that is, the first of the season, are composed wholly of the salivary gum, and are so difficult to obtain that they are frequently sold in the Celestial Empire as high as three guineas ($15) a pound. In general shape they resemble the nest of our own chimney swift, but are of a translucent white colour, and appear as if woven of threads of isinglass.

In the West Indies the long flower-spathes of the cocoanut palm often hang on the trees in a withered state for many months; and up inside of these the Palm Swift finds a safe and convenient place to affix its nest, composed of feathers glued together with the same salivary gum. This plan of fastening the nest to the inside of a hollow tube or shaft seems to be a favourite one with several of the American species. Not only is the idea shown in the choice of the chimney swift, but there are two species which actually construct the protecting tube for themselves. *Paniptila Sancti Hyeronimæ* inhabiting Guatemala, attaches to the underside of an over-hanging rock a tube some feet in length, composed of the seed-down of plants caught flying in the air and glued together with saliva. Entrance to this is from below and the eggs are laid on a kind of shelf near the top, Very similar is the nest of a Brazilian species, *Chaetura poliura*, only in this case the tube is suspended from the branch of a tree and is covered with bright coloured feathers. There is no shelf within to receive the eggs, and it is believed that these are cemented against the side of the tube and brooded on by the bird while in an upright position.

Having thus referred to the characteristics of the family in general, and to some of its more interesting members in other lands, we will perhaps be better prepared to consider the peculiarities of our own bird, the American chimney swift *(Chætura pelagica)*. This bird is about 5 inches in length and 12 to 13 in extent of wings. The general colour is a dull dark gray, considerably lighter on the throat and breast and having a faint gloss of metallic green on the back. On taking either of the specimens on the table in the hand one is at once struck with the singular appearance of the tail, each of the ten quills ending in a strong sharp spine formed by the shaft being produced about a quarter of an inch beyond the vane. Such a form of tail is almost valueless as a steering apparatus during flight, but serves admirably the purpose for which it is used—that of a prop to support the weight of the body while at rest; for the only position of rest ever assumed by this bird is a vertical one, as it clings to the inside of a chimney or hollow tree braced up by this strong spiked tail. A woodpecker at work on the outside of the tree would assume much the same position, but in his case the spineous nature of the tail is less marked, while the foot is suitable for climbing, that of the swift being weaker and fitted mostly for clinging.

The next striking feature is the great length of the wings, the distance from tip to tip when fully extended being more than 2½ times the extreme length of the body. The ratio of these two measurements in most land birds is about as 1½ to 1. In the swallows it only reaches 2 to 1; and the proportion shown in the chimney swift is only exceeded, if at all, by one or two of the hawks and some of the long-winged seabirds, as the frigatebird and the wandering albatross.

Referring to the latter it is worthy of notice that in these seabirds the great stretch of wing is due to the lengthening of the inner joint or *humerus*, the other bones being comparatively short, while in the wing of the swift and all birds of the same order the proportion of the bones is exactly reversed. The *radius* and *metacarpals*, or forearm and hand, make up almost the whole of the wing, the inner joint being so short that the carpal angle is almost covered by the feathers of the shoulder. And there is a corresponding difference in the style of flight. The seabird propels itself by long measured sweeps, or soars for whole minutes without a movement, whereas the wing of the swift is constantly a-quiver as he darts and dives hither and thither after the insects that make up his food. Much as the swallows resemble the swifts in colour, size and habit, it is not difficult to distinguish between them when on the wing. The motions of all the swallows are more measured and graceful, being guided by the long rudder-like tail, while the swift might be compared to a short boat without a rudder but having very long oars, not quite suited for following a perfectly straight track, but making splendid time and brilliant steering on a very tortuous course. The small flattened and curved bill looks at first sight ill-suited for its duty of capturing insects in rapid motion, but it will be noticed that the mouth is cleft far beyond the base of the bill, reaching to a point just below the eye, and when wide open the gape is really very great There is an eyebrow or shade over the eye to protect it from the glare of the sun. A similar feature is seen in some eagles, which have a prominent bony shelf above the eye. That of the chimney swift, however, is formed entirely of feathers.

These birds are late comers with us, most of the swallows generally appearing some time before them, but they atone for tardiness by remarkable regularity. The records of a number of years show that they may be looked for in Ottawa almost with certainty on one of the first six days of May; and when they come they come altogether. To-day, perhaps, not a swift is to be seen, or at most but a couple of pioneers; to-morrow the whole colony is with us. They take up their abode at first in what may be called the swifts' immigrant shed. I call it by that name because none of the birds have any intention of making it a home in which to bring up a family. This temporary shelter is a ventilating tower at the northeast corner of the Western Departmental Building. Here on any fine evening in May they may be seen in countless numbers, sporting and chasing each other high in air, at first extending their gambols over the whole of Parliament Hill, waiting for the stragglers to come home, perhaps from an afternoon's trip to the St. Lawrence, or far back over the Laurentian Mountains, for distance is nothing to them. As the evening advances, however, the whole flock commences to take up a circling motion round the favourite tower, though still high above it. Gradually the circle becomes narrower and a few birds will now and then dash down at the windows of the tower as if about to enter; but these are only "false offers," for the birds sheer off and rejoin the twittering stream above, which is all the while drawing lower down and closer together, until now the sun has fallen behind Chelsea Mountain, and just as the twilight comes on, the stream narrows to a living whirlpool whose vortex is the tower window. Then with the roar of many wings beating together they pour into the opening. There are four such windows within a few feet of one another, but the swifts use only one, the eastern; and as it is too narrow for the multitude of birds pressing in, many flutter against the stone work and eddying off at the sides heighten the resemblance of the whole to a whirlpool. These fall into the main current again when its force slackens, and soon the last swift has entered for the night.

The great Audubon and several other ornithologists describe the chimney swifts as prolonging these gambols after sundown far into the dusk, and Nuttall even calls them nocturnal birds; but with us they always retire with, or soon after, the setting sun, and when the last straggler has disappeared there is still light enough to read a book without much difficulty in the open air. The observations of most of these naturalists were made in the Central and Southern States, where even in summer the nights are of considerable length. In our northern latitude, on the other hand, the short duration of the hours of darkness at this season compels the birds to seek more promptly the rest so much needed after the incessant activities of the long bright day.

At this hour the inside of the ventilating shaft is too dark to permit one to see anything of its occupants, but on the 20th of May last I was fortunate enough to find them almost all at home in the daytime. The weather was cold with a light rain, and, as the swifts are very suscept ible to a fall in the temperature, only a few score ventured out to circle round the building or take a short turn over the city. Entering one of the ducts through a trapdoor in the attic, a journey of a few feet on the hands and knees was well repaid by the view within the shaft. The tower is an octagonal one, built of stone lined with bricks, the space within being about 8 feet across. Up through the centre passes an iron smoke-pipe from the furnaces in the basement. This is about 3 feet in diameter, so that the intervening space leaves ample room for a view of the wall lighted by the little windows at the top where the swifts find entrance. All round the inside the birds were clinging against the wall, shoulder to shoulder, covering every available inch from a short distance below the windows down to about 10 feet above my head, a space of probably 18 feet in height. Many were continually fluttering in and out, knocking each other off and beating about in the dim light with endless flapping and twittering. The wall surface covered would be about 470 square feet. Audubon in making a rough computation of the number of a flock roosting within a hollow tree which he visited near Louisville, Ky., allows 32 birds as the number resting on each square foot of surface. At this rate the census of the Ottawa colony would reach 15,040. I believe, however, that this is considerably over the mark. On several evenings I took the time occupied by the flock in entering the tower, which proved to be about 16 minutes. If there were as many as 15,000, it would require something over 15 birds to pass in during each second, The opening is a small one, about 1 foot by 3, and it seems hardly possibly that they can crowd in at such a rate, though they certainly go faster than one can count. Probably 9,000 or 10,000 would not be far from the true number of the flock. There is at the bottom of the shaft a mass of droppings and feathers, evidently the accumulation of several years, but no sign of a nest anywhere. This place is not made use of by them for that purpose.

Inspection of the tower during daylight on a number of other occasions when the weather was fine showed not a single swift within. It is well known that they never rest in the open air, and as there appears to be no other roost in this neighbourhood the conclusion is almost unavoidable that these tiny creatures spend the whole 16 or 17 hours of the summer day upon the wing. What restless energy in those little pinions! And what a vast quantity of insect food, in the aggregate, must be consumed in order to sustain such untiring muscles!

In the year 1869 the late Lt.-Col. Wiley read a paper on "Swallows' before the Ottawa Literary and Scientific Society, in which he gave an interesting account of this same colony. Their favourite rendezvous was then a tower in the Eastern Block, from which they were afterwards excluded by placing a wire netting over the openings. It is to be hoped that they may long remain undisturbed in their present quarters. The good work done by such a flock in clearing the atmosphere of insects must be almost incalculable. And for this we are now more than ever dependent upon the swifts, since almost all the swallows and other insect-eating birds have been driven from their city homes by the European sparrows.

There are several other similar towers about the Government Buildings, but none of these are ever occupied by the swifts, so intensely gregarious are they in disposition. When nesting time comes, however, the case is exactly reversed. The birds are scattered over the city and probably far into the country, and seldom, I believe, is there more than one pair found nesting in any one chimney.

Amongst all the feathered tribes, at the nesting season, the males are endowed with some distinguishing mark of beauty or some accessory power of display which serves to point out to the other sex the most vigorous and desirable among many suitors. The brilliant colours, the wonderful growths of ornamental plumes, the sweet songs or extraordinary calls of many birds in spring time are all to be accounted for upon this principle. In other species the same end is served by curious feats executed, generally on the wing, but sometimes on land or water. The drumming of the partridge is a familiar instance of this kind of performance; and though very different in style, the courtship of the chimney swift may be classed under the same head. At all other seasons they hunt singly or in pairs, twittering frequently; but during the latter half of May they are almost always to be seen in groups of three. The twittering becomes almost a continuous trill, and the lines of flight more graceful. Neglecting those zigzag darts after insects which mark their course at other times, and keeping for a long time the same relative positions, the little trio sail low down over the houses and tree-tops in long sweeping curves as if conscious of being on exhibition. By the first week in June these preliminaries are over. The unfortunate rejected has given up the suit and has retired to spend the summer in celibacy, with others equally unlucky, at the tower; and the mated ones at once set about the selection of a suitable chimney, free from fire and smoke, and tolerably clean from soot for the firm attachment of the nest. The few necessary building materials are supplied by any tall tree having dead twigs at the top. The birds while on the wing seize the twigs, and by a sudden twist break off short pieces and carry them away to the site already chosen. These are glued to the side of the flue and to each other with the mucilage secreted in the mouth of the bird as already mentioned, and are formed into a light and strong saucer-shaped nest. No down or other soft material is placed within, but the eggs are laid upon the bare framework of the nest.

On the 3rd July, 1890, I was fortunate enough to discover the nest of a pair of these birds in one of the chimneys of my house. By removing the stopper of a stove-pipe hole and placing two small mirrors in suitable positions in the flue I was able to see a good deal of the household management of my little guests. The nest was about three and a half feet above the pipe hole and eight feet from the top of the chimney; and was when unoccupied nearly hidden from sight by a slight "jog" in the chimney. Although during several weeks before that the birds had been heard in the flue and careful watch had been kept, the operation of building had not been seen; and indeed the exact location of the nest was only made known by the long wings of the bird projecting from it after egg-laying or, perhaps, incubation had begun.

Whether both birds or only the female took part in the nest-building is uncertain, but it appears to have occupied more than a fortnight. During the nine or ten days of incubation the mate did not appear to roost in the chimney and seems to have been rather remiss in his attentions. Indeed, I did not see the two birds together in the chimney during all this time. After the young were hatched, however, which took place on the 13th July, the male became less neglectful of his family duties, taking a fair share of the task of feeding the young, and always spending the night within the flue, not far from the nest. These observations are in accord with the fact that the birds resorting to the tower of the West Block, though somewhat reduced during the latter part of June and the first half of July, still formed a large flock, perhaps half of the original number; while after the time of hatching out they rapidly dwindled,—no doubt, by the calling away of the males to assist in the care of the young. On the evening of the 2nd of August not more than forty or fifty were seen to enter the tower.

For the first week the young were kept constantly covered by one or other of the old birds, who relieved each other at intervals of half an hour or an hour. Contrary to the descriptions given in most of the books treating of the swift, these birds seemed to be but poor climbers. They would flutter down from the entrance with wings half open above the back and alight at some little distance from the nest, generally below it. Then after a moment's rest, they weuld scramble up to the nest, half climbing, half flying, being never seen to ascend the wall without the assistance of the fluttering wings.

There was something about their manner of feeding the young which struck me as remarkable. When one of the parent birds returned from hunting and took its place on the nest, as I have just described, it would not proceed to feed the nestlings until after an interval of several minutes. Then without uncovering the nest it would put its head down and make a sort of contortion of the whole body, and at the same time the young would be heard to peep. This action would suggest that the food, instead of being carried in the bill, as is done by other birds when feeding their young, is disgorged from the crop after the manner of the vultures and some seabirds. And may it not be possible that the mucilaginous secretion, so useful to these birds in nest-building, plays just as important a part in the nourishment of the young? What yields such delicious soup for a Chinese mandarin ought surely to make good pap for a young swiftlet. Something analogous to this is well known to take place in the pigeon family where the nestlings are fed with a material disgorged from the crop of the parent and consisting largely of a milky and nutricious fluid secreted by the walls of the crop.

In such works as treat of the swifts the subject of nourishment of the young is touched but lightly, if at all, though some writers express a suspicion—it is never stated positively—that they are in the habit at this season of hawking during the night for insects to supply the often recurring demands of the nestlings. It is true that the roaring of wings in the chimney and the voices of both old and young birds are to be heard several times every night; but I believe this may be accounted for by the movements of the parent birds in exchanging places as they take turns in the care of the young. The mate generally roosts at some little distance from the nest, and, as remarked before, they always move either by actual flight or by a half-flying, half-climbing movement which is sufficient to occasion all the noise that is heard. Moreover, though bats and night-hawks are visible enough any summer night, I do not know any record of a chimney swift having been seen in pursuit of prey, even by the brightest moonlight, after nine o'clock; and so far as my observations extend they seem to show greatest activity and highest flight during the sunniest hours of the day. The presence of the shade over the eye, too, seems to mark this bird as a lover of sunshine rather than of dusk.

The regular complement of eggs is from 4 to 6, but only three were hatched out in this case. The young grew rapidly, however, and soon filled the nest to overflowing.

By the of 4th August the stiff tail feathers were plainly visible, and as the young seemed to be crowding each other over the edge, I took a stick and dislodged the nest, catching it and its contents on a cloth fastened across the flue for that purpose. The little birds were not at all injured and started at once to climb up the side again, using claws, wings and tail with much vigor. One taken out and kept in the room a few minutes proved to be about half fledged and was in colour and markings exactly a miniature of the old birds. On the floor it struggled about helplessly, but when put near the window curtain it would climb quite rapidly with outspread and fluttering wings. The parent birds on returning and finding the nest fallen and the family scattered did not make as much commotion as most other birds would do under like circumstances. Such accidents are said to be a matter of common occurrence with them, especially in rainy weather when the water trickling down softens the gum which holds the nest to the wall. I replaced the third nestling in the chimney, and after he had crept up a little distance, one of the old ones came down and, putting its head under the angle of the outstretched wing of the little one, helped it up to the ledge above, on which the nest had formerly stood, and where all three seemed now much more comfortable than when crowded together in the nest.

I had hoped that after the fall of the nest the young would remain below where, having a better view of them, I should be able to see the process of feeding more plainly. On the contrary, I saw but little of them from this out, as they were continually moving from place to place and only one mirror could be brought to bear on them. They soon grew so large as to be almost undistinguishable from the parents, though they did not yet attempt flight in the outer air On the 14th and 15th of August, however, I noticed them mounting on the wing toward the top of the flue and then settling down again. Perhaps this is their usual manner of learning to fly. Unable as they are to rise from a flat surface, a first lesson in the open air, which would probably result in a fall to the ground, might prove disastrous, or even fatal, to them.

About this time the numbers resorting to the tower were rapidly increasing again, showing that the nesting season was almost over. On the 19th of August I was called away from town, and on my return at the end of the month my little visitors had disappeared. Even at the rendezvous of the tower only a few remained, and these soon followed the main army to its winter quarters.

Where do they go when they leave us?

A poet tells us that when these northern shores become bleak and stormy:

"Far over purple seas,
They wait in sunny ease
The balmy southern breeze
To waft them to their northern homes once more."

Ornithologists, however, though able to point out with a fair degree of certainty the winter resort of each of the American swallows, as well as of most of the other birds on the Check-list, have nothing to tell us of the wherabouts of the chimney swift at this season. He has never been reported from Central or South America, and from the beginning of November, when he is last observed at the southernmost stations of the United States until his reappearance there about the middle of March, his written history is a blank. To account for this mysterious disappearance the old theory of hibernation has been partially revived by some ornithologists.

In the days when the swallows were supposed to spend half the year buried in the mud at the bottoms of lakes and ponds, the chimney swifts were assigned winter quarters somewhat more congenial in the hollow tree from which they used to he seen issuing in such vast flocks on the sunny mornings in spring. Alexander Wilson writing in 1810-13 found it necessary vigorously to combat these ideas. But our knowledge has made but little progress in this direction in the meantime, and Dr. Coues in his "Birds of the Colorado Valley," discusses the question of possible hibernation seriously and at some length. The trouble is that nearly all the evidence on either side is negative; and to this shadowy array of facts we in Ottawa can add our little quota—that the swifts cestainly do not spend the winter in the tower which is their favourite home in spring and autumn. This has been proved by inspection for two successive winters.

Before saying farewell to this little bird let us again place him for a moment side by side with his rival and imitator, the swallow. Even in the points of superficial resemblance, which at the beginning of this paper we took such care to overlock, there is, I believe a lesson for the student of natural history; for they show how creatures of very different origin and structure may take on a great degree of external similarity through living upon similar food and under similar outward conditions. The swifts are probably the older family in their present form, and as we have seen, have become almost perfectly adapted to the life which they have chosen. But apparently they had not taken up the whole ground, for in the course of time there appears another family radically different in structure and belonging to a much higher order, the Passeres. It covets the food of the swifts, which can be taken only in one way—on the wing, as those birds take it; so it adopts their manner of life, and in time, without losing its passerine characteristics, the swallow becomes superficially so like the swift that to the casual observer they are both as one. Not only does the resemblance of these families cover the general colour of the plumage, the shape and proportion of the wings and consequent style of flight, the form of head and wide-gaping mouth, adapted for scooping in the fluttering prey, but even the voices of the two, in spite of the great difference in the structure of the syrinx, are really so much alike as to be easily confounded. A still more interesting point of similarity is seen in the way both the swift and the swallow have changed their manner of nesting to suit the change caused by the advent of civilized man. As long as this continent was under the domain of the red man the chimney swift, as has been shown, found a place both for roosting and nesting in a hollow tree, closed at the bottom and with a narrow opening at the top. The barn and cliff swallows fastened their castles of mud and straw against a lofty rock, while the purple martin and the white-belly nested in crevices of the rock or in deserted woodpecker-holes in the trees. The white man came upon the scene, and long before his progress had cleared away, even, any large fraction of the forest, the swift had found out the superior advantages of protection and stability afforded by an empty chimney; for even Wilson at the beginning of the century knew the bird only as the chimney swift and spoke of the hollow-tree habit as a thing then long passed away. The barn swallow and the martin were almost as prompt in seeking the shelter offered by the outbuildings of the farmer; and now the cliff swallow, the white-belly and the rough-wing, though a little behind, are fast following the example. The bank swallow alone still clings to the home of his fathers, a burrow in the side of a bank of sand or gravel. The tunnelling out of such a nesting place must often involve heavy labour. Perhaps those little feet of his, feeble as they look, have retained something of the strength of his passerine ancestors, and, if so, he is in this respect less swift-like than his brethren who have, with the swifts, adopted the ways of civilization.

Other examples could be cited of this principle by which a superficial likeness is produced in really different birds by similar environment, as for instance the resemblance of the shrike or butcher-bird to the hawks; but, perhaps, in the whole class there is no case where the real difference and the apparent similarity are at once so great as in this of the swift and the swallow.

* * *

EXCURSION No. 3 (1891).

The completion of the first section of the Gatineau Valley Railway, running into the heart of the Laurentian Mountains, will afford easy access to a district which has always possessed great attractions for the collector and observer in almost every branch of natural history. The excursions of the Field-Naturalists' Club to King's Mountain have usually been amongst the most satisfactory outings of each season both from a scientific and financial point of view; but attempts to penetrate *en masse* further into the hills have generally proved unsuccessful owing to the wearisome length of the drive. The Excursion Committee expect shortly to complete arrangements with the Railway Company for an excursion of the Club to the village of La Peche, or Wakefield, which is pleasantly situated in a widening of the valley, at a point where a smaller stream, the Rivière de la Peche, empties into the Gatineau, about twenty-one miles from Ottawa. Several members of the Club can vouch for the beauty of the scenery upon the route, running, as it does, in and out of the hills along the river bank.

To be transported to the midst of the Laurentians in an hour's time will be a novel experience for Ottawa excursionists, and it is hoped that a large number of members and their friends will attend. The event will probably take place within the first fifteen days of September. Due notice will be given by circular.

SUMMARY

—— OF ——

Canadian Mining Regulations.

NOTICE.

THE following is a summary of the Regulations with respect to the manner of recording claims for *Mineral Lands*, other than Coal Lands, and the conditions governing the purchase of the same.

Any person may explore vacant Dominion Lands not appropriated or reserved by Government for other purposes, and may search therein, either by surface or subterranean prospecting, for mineral deposits, with a view to obtaining a mining location for the same, but no mining location shall be granted until actual discovery has been made of the vein, lode or deposit of mineral or metal within the limits of the location of claim.

A location for mining, except for *Iron* or *Petroleum*, shall not be more than 1500 feet in length, nor more than 600 feet in breadth. A location for mining *Iron* or *Petroleum* shall not exceed 160 acres in area.

On discovering a mineral deposit any person may obtain a mining location, upon marking out his location on the ground, in accordance with the regulations in that behalf, and filing with the Agent of Dominion Lands for the district, within sixty days from discovery, an affidavit in form prescribed by Mining Regulations, and paying at the same time an office fee of five dollars, which will entitle the person so recording his claim to enter into possession of the location applied for.

At any time before the expiration of five years from the date of recording his claim, the claimant may, upon filing proof with the Local Agent that he has expended $500.00 in actual mining operations on the claim, by paying to the Local Agent therefor $5 per acre cash and a further sum of $50 to cover the cost of survey, obtain a patent for said claim as provided in the said Mining Regulations.

Copies of the Regulations may be obtained upon application to the Department of the Interior.

A. M. BURGESS,
Deputy of the Minister of the Interior.

DEPARTMENT OF THE INTERIOR,
Ottawa, Canada, December 19th, 1887.