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THE OTTAWA NATURALIST



OTTAWA FIELD-NATURALISTS' CLUB

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THE OTTAWA NATURALIST, established thirty-one years ago, "to publish the results of original research or investigation in all departments of natural history," is issued monthly from September to May, inclusive. All receipts from the publication are invested in the magazine itself. Papers, notes and photographs for publication should be addressed to the Editor. The subscription price is One Dollar a Year. Subscriptions should be addressed to the Treasurer, Mr. F. W. Waugh, Geological Survey, Victoria Memorial Museum, Ottawa.

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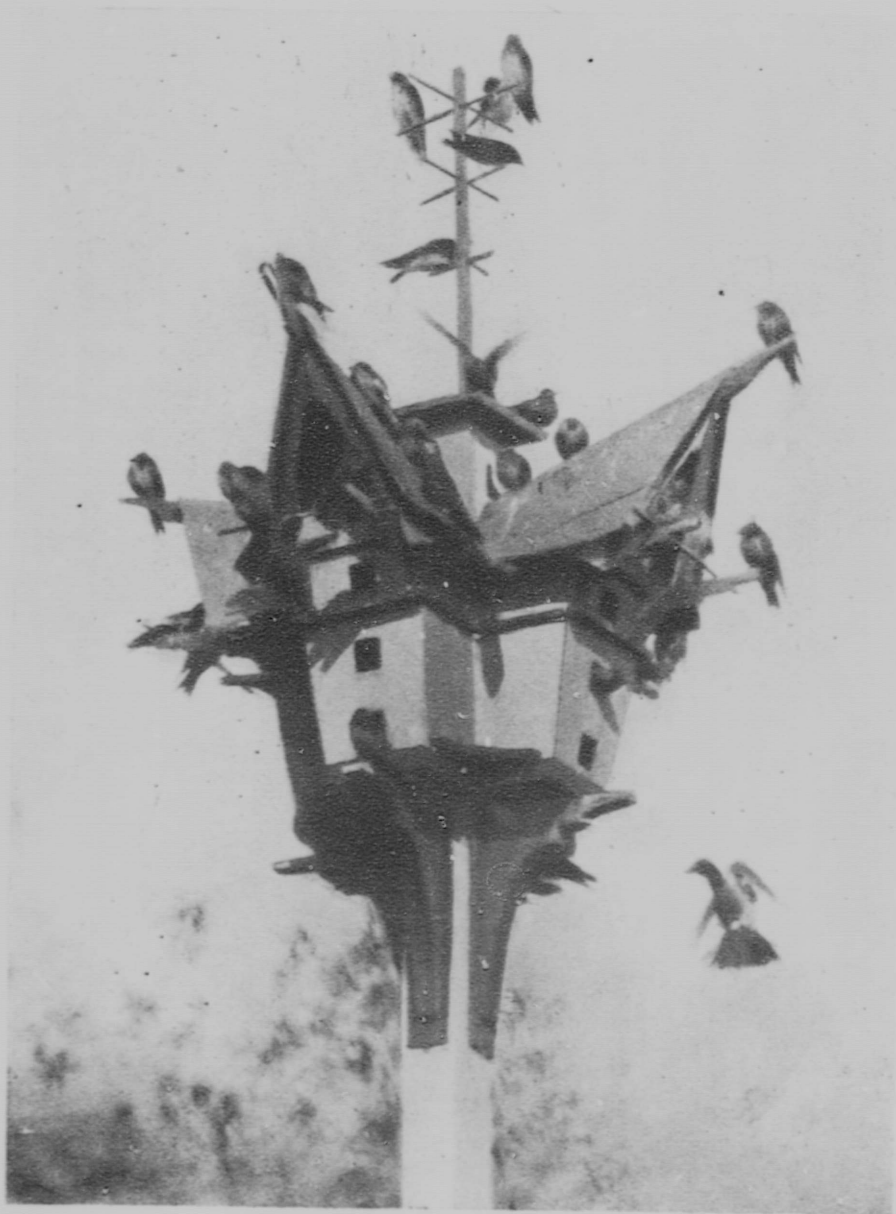
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A SUCCESSFUL MARTIN COLONY.

THE OTTAWA NATURALIST

VOL. XXXII.

JANUARY, 1919.

No. 7.

BIRD-HOUSES AND THEIR OCCUPANTS.*

By P. A. TAVERNER.

Like *Derdemonia*, we "have a divided duty". On the one hand to cultivate the land cleanly, and on the other, to attract birds to it. These are opposed duties. If we cut the dead wood from our wood lots, parks, and groves; clean out, sterilize, and fill rotting spots in limb and trunk with concrete, we deprive many birds of nesting facilities. If we clear out tangled brush, cultivate to the fence lines, open the ground about young, second-growth plantations, and drain the last marshy spots, we deprive many of necessary cover and the food that goes with it. Insect, weed, and small mammal pests may be reduced; but so, inevitably, will the birds as well. The consequence is likely to be that, whilst our control of pests on the whole will be better, we shall be subject to occasional sporadic outbursts of species that are not subject to these particular methods of control. Whilst the study of their food habits may suggest that birds do not usually partake largely of those insects (for example, the potato bug) whose numbers commonly assume plague proportions, it is also evident that insects that birds systematically feed upon, rarely become plagues. We know, to our sorrow, the few instances where our control is inadequate, but we have no means of knowing the innumerable cases where it has warded off disaster.

The real value of birds as guardians of our fields and gardens is not in the individual species but in the aggregate, each filling its own narrow field, yet all combined, covering every weak point. The swallows hawk through the upper air; the vireos, orioles, and tanagers haunt the tree tops; the woodpeckers and chickadees, the limbs and bark crevices; whilst thrushes examine the debris of wooded grounds and the sparrows and meadow larks scour open fields and shrubbery tangles. In fact at no period of their life cycles are insects free from avian attack—flying, creeping, hiding or buried in the ground or in solid wood—there are species of birds fitted for and eager to attack them. Should any one class of these, our unpaid assistants, be

prevented from functioning, an opening is left in our defence that may be an Achilles' heel to our undoing. If we turn our woods into groves, meadows into lawns, and tangles into formal shrubbery something of this sort is possible, unless compensations are provided. In the home grounds and city streets and parks the ideal of clean cultivation is most nearly approached and here it is the more necessary to provide artificially the necessities of bird life that are missing.

Bird boxes will largely compensate for natural cavities in trees and carefully selected plantings of shrubbery and decorative flowers in naturalistic design will supply cover and fruit and seed food. If we fortunately succeed in reducing insects to a point dangerous to bird welfare the deficiency can be supplied by scraps of animal matter presented at feeding stations, on shelves, or in shelters. In these ways only can we partially compensate for our interference with the natural scheme and retain wild birds under conditions of high cultivation. Incidentally, as the home lot is the first to be made attractive to birds, we draw their interesting personalities close about us, and in place of having to tramp miles to their secluded haunts, decoy them to our very windows where they can be enjoyed practically continuously instead of occasionally, intimately instead of distantly, and at ease instead of by exertion. Any one of the methods above suggested requires, for intelligent development, a paper to itself; and the first, only, the building of bird houses and boxes, will be here discussed.

The first thing to consider in building a bird box is the species for which it is designed. Each has its own requirements and though its necessities are more or less elastic the more nearly we fulfil the bird's ideal the more successful we shall be in getting it to use what we provide. In short we must cater to the customs and idiosyncrasies of our tenants and not to our own ideas of convenience and beauty. It

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is only after the former have been fully met that we can indulge the latter. This does not necessarily mean that taste and ingenuity in the designer is an objection, but only that the fundamental rules of art govern bird house building as well as more serious architecture—that the structure must first be adapted to its intended use and that beauty that interferes with this use is false art and bad architecture. A shingled cottage built to look like a mediæval castle is bad taste, and a bird house in too close imitation of a city hall, viewed by the canons of pure art, is equally questionable. Artistically, the most successful bird house is the one, which, while fulfilling the practical bird requirements, retains pleasing lines and agreeable surfaces but looks frankly what it is—a house for birds and not a toy human habitation.

THE PURPLE MARTIN.

Probably the bird most generally welcomed about the home is the Purple Martin. This is our largest swallow, comparable in size to the omnipresent, English, or, as it is more correctly named, House Sparrow. In colour, the adult male is all black with steely and purple reflections that give the species its name. The female and young male are almost black above with slight indications of iridescence, dull or dirty grey below, almost white on the abdomen, and darkest across the breast. The forehead is greyish, leaving a contrasted dark bar from the bill through the eye, bounded below by the lighter throat.

Esthetically, the Martin is a joy forever. Its deep throat gurgles and soft warblings fall pleasantly upon the ear. Unlike these pests the Grackles its voice is never raucous or harsh, nor has it the egg-stealing proclivities of those clownish rascals. Misguided people will occasionally be found who object to having their morning's rest broken even by Martins. Doubtless such folk would object to being awakened by a symphony orchestra. They should be pitied rather than blamed; but, in either event, disregarded. To my mind the soft morning chorus of the Martins is soothing and does not disturb rest; but is conducive to a luxurious semi-consciousness or borderland to sleep that permits the enjoyment of slumber without awakening.

Martins are companionable. They live together in colonies, visit each other's housekeeping establishments, and chatter together continually. The new comer is greeted pleasantly and the departing guest sent on his way with good wishes and merry quips. Visitors from other colonies are received and permitted to peer in and examine the growing families with the expressed satisfaction and approval of all concerned. The greatest good nature prevails.

Though passing differences of opinion may occasionally occur and be argued loudly and vigorously, they are rare and do not interfere with the general harmony of the colony. It is only when strangers of other species intrude that all unite to eject them. The House Sparrow is on its best behaviour on the premises and even the family cat walks with circumspection, retreating hastily if not gracefully to the nearest cover at the first assault of the angry birds. In fact such open rough and tumble warfare and tumult is not to the cat's liking and it usually prefers a considerable detour to crossing the open under a thriving Martin colony.

Martins have a strong love of home, and certainly develop a sense of proprietorship, almost human, in the house they are accustomed to occupy. The occupation of a new house already in the possession of Sparrows or other birds, is seldom insisted upon, but on return in the spring to an ancestral home, intruders are positively and rudely ejected. Sparrows, being already on the ground and choosing the most desirable locations before most migrants arrive, often succeed in fighting off other more desirable tenants or even jumping the claims after they have been established by legal possession and labour, but the Purple Martins are a match for sparrows nearly every time, though, like law-abiding citizens, they rarely lay claim to more than they have legal title to. Another point of interest in regard to Martins and their attachment to their home, is the fact that they return to it after its use as a nursery is past. Other birds, probably all other Canadian birds, evince no interest in a nest after the young have left it, at least until a new nesting season recalls it to use. With them the nest is not a home or a shelter, but merely a receptacle for holding eggs and young, useless and without interest when that use is accomplished. Martins, however, retain possession until they gather, for the fall migration, and the old homestead remains the family meeting place until the time of departure comes. After the middle of August, though through the day the Martin house may stand empty and silent, towards evening the whole joyous colony regather about the home of their late infancy and family associations. They clatter, gurgle, and exchange family jokes and affectionate greetings until, as the sun goes down, they crowd into the cubbyholes and the wonder is where so many fully grown birds find room. Their voices grow softer and night and silence steals over all. As daylight comes, awakening chirps are heard, heads appear at the doors, birds emerge, and from the topmost points of the house they roll a vocal welcome to the day. Soon all are displaying themselves to the morning sun, preening and fluffing to let the grateful warmth sink

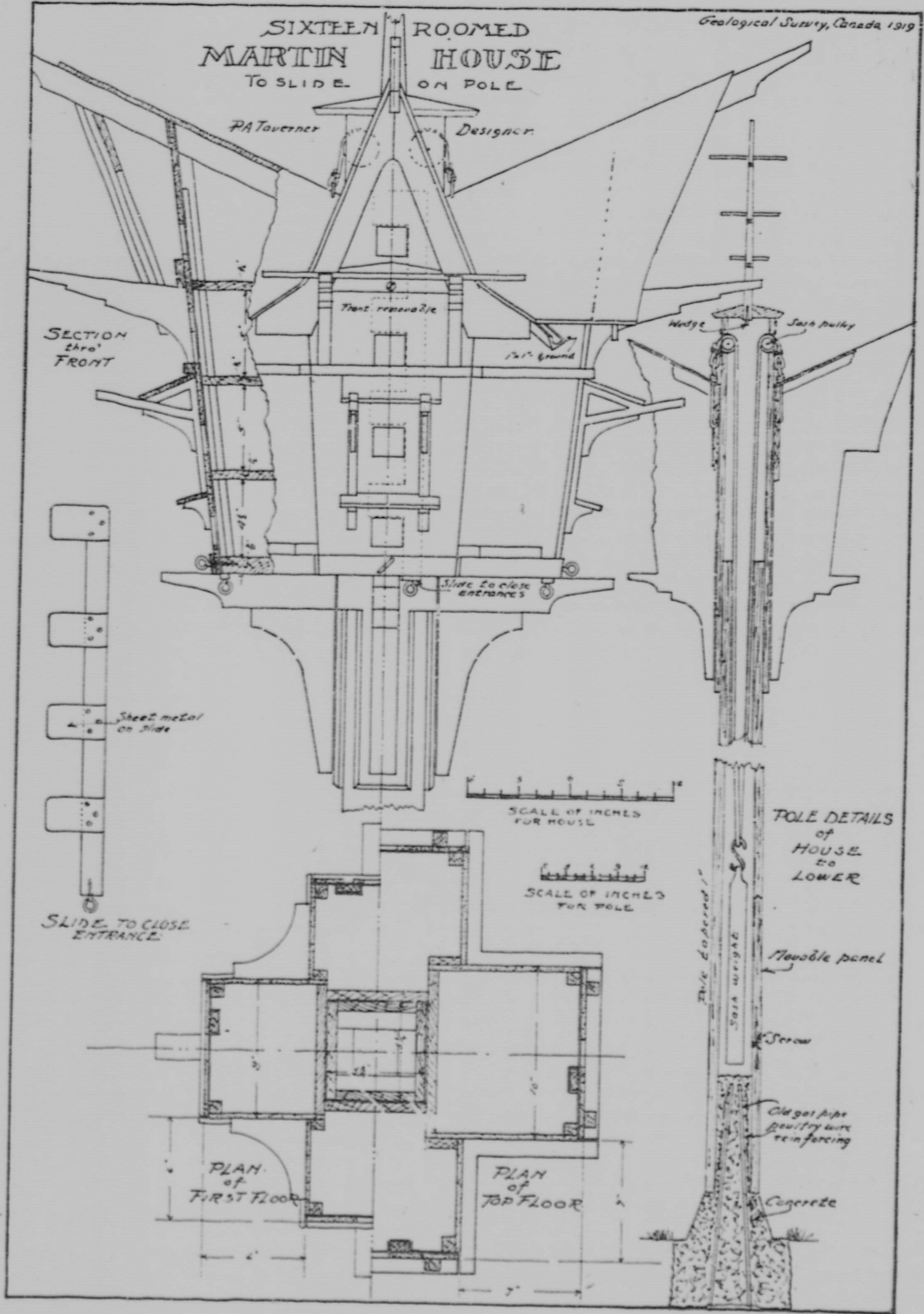
into the base of their plumage. As the sun gets higher they make short flights here and there, amidst a chorus of happy bubbling song. By the time the office man is betaking himself to his daily grind, the Martins bethink themselves of their serious duties of life, and hie away for the day, over marshland and meadow, field and stream, housetops or country, until evening again calls them together. Such are some of the attractions of Purple Martins and the tale is not nearly exhausted.

Purple Martins are the only birds we have that will occupy a nesting box in colony. Other birds that can be induced to come to artificial nest receptacles are solitary in their breeding habits and impatient of close neighbours even when of their own species. Hence it is useless to build bird houses of more than one compartment for other species than Martins. The rooms should be about six inches square and about the same height. A little more or less either way will not matter, but these sizes should be approximated. The rooms should be entirely separate from each other and not intercommunicating. They should be light, be draught and weather-tight and have only a single entrance each, which may be either round or square, one and three-quarters of an inch and about one or one and a half inches up from the floor. This last is important. A perch or shelf, outside, on the level with the entrance, is objectionable as the young come out on it before they can fly, and the natural crowding for position is certain to precipitate some to the ground. Such occurrences cause great disturbance and anxiety to the whole colony, but I do not think that the unfortunate victim of the accident is ever fed or raised, even if the commotion does not attract the watchful cat. A perch somewhat below the door, wide enough to comfortably hold one or more grown birds, is desirable, as Martins love to sit about, and the more perches and shelves there are for this purpose, the better they seem to like it and the more attractive the colony is both from their viewpoint and ours. The doors should be sheltered as much as possible by over-hanging eaves and porches. Driving rain beating into the nests of young birds is a deadly enemy and, probably on this account, the best sheltered entrances are most in demand. In the house in the frontispiece the two upper floors are always most in demand. Consequently, since the picture was taken, additional porch shelters have been placed over the lower entrances and it is expected that these will make them more popular. The whole house should be covered with a good, tight, weather-proof roof. Dampness means cold and that is death to young birds. It is also most advisable to arrange the house to open so that after the birds have left for the winter the rooms can be thoroughly

cleaned out. During the infancy of the young, a certain amount of house cleaning is attended to, but later the birds have no time for such drudgery, and the debris from a couple of season's occupancy will leave little room within. The house should be erected in the open, away from trees, or at least as high as the top of closely adjoining buildings. Ordinarily it should be from fourteen to twenty feet from the ground, depending on surroundings, high enough to allow free flight and manœuvring room about it.

The materials of which the Martin or any other bird house can be made may be varied to suit taste or opportunity. Lightness, however, is desirable, especially in a large house or in one that has to be supported on a long unbraced pole, in the open, in wind and storm. Light pine, $\frac{3}{8}$ or $\frac{1}{2}$ inch thick is usually sufficient. For paint, it should preferably be dressed, but rough stuff takes stain better and is more in general keeping. The house in the frontispiece was built of beaver-board—a heavy cardboard—on a wooden frame and the roof and exposed surfaces covered with cotton well painted down. It has been up two seasons now and shows no signs of deterioration that a brush-full of paint will not remedy. Probably a better material is the light wood of which orange crates are made. It would probably be well to give the house a good coat of black paint inside to prevent the light from glowing through it. The support is a built-up box pole hollow in the centre and set on a concrete base, as shown in the details accompanying. The house itself slides up and down the pole on counter weighted cords running over common sash pulleys in the top of the pole, with a heavy window weight inside. A bag of sand would do as well for the latter. This allows the house to be easily lowered to remove trapped sparrows or to be cleaned. Access is gained to the weight box inside through a removable section near the base.

These are about all the rules necessary for the erection of a successful Martin house. It may have as many rooms as desired, the more the merrier, and the larger the colony may grow, but there should at least be several; for Martins are sociable and love the company of their kind. Bearing in mind these requirements and the principles of good taste previously mentioned, there are no reasons why a Martin house that will be a constant source of pleasure to the neighbourhood may not be built by almost anyone. After such a house is once erected, about all that can be done is to await its occupation and meanwhile keep the sparrows out. They will invariably occupy it if not prevented. One good way to exclude them is to arrange entrances that can be easily closed from below. Should sparrows



then get in the door can be closed and the entrapped occupants destroyed. It is said that sparrows so caught can be released again after a period of confinement and that the house is a trap to them thereafter, and their fear of it will be communicated to their companions. Though this may be true, for it is not out of keeping with the intelligence of our rowdy sparrows, who at times show an almost uncanny ability to take care of themselves, I will not personally vouch for it. A dead sparrow makes no nests, of that I am assured and I proceed accordingly. Where it can be used, a .22 rifle with shot cartridges is the most satisfactory sparrow eradicator. Its range is short and its fine shot harmless at very limited distances. In the hands of a man of ordinary intelligence it is to be highly recommended. Sparrows, however, soon grow very wary, precipitately retreating at sight of a man with a gun in the distance, only to return to hurl derision, from the bird house peak or entrance, at their baffled enemy. In such a case a set gun discharged from ambush is very effective. A couple of stakes driven into the ground within range of the perch usually occupied, nails for barrel and trigger-guard from which to hang the gun aimed at the spot, and a long string to the trigger passing through screweyes to an ambush, form an engine of destruction that will effectively discourage the wariest and most persistent of sparrows. It is of proved effectiveness against that last pair that continue to baffle more open methods.

If fortune smiles Martins may come the first spring, but if she is fickle it may not be until the second or even the third season. It was the third season before the writer got Martins in his house and then only a single pair came. What appeared to be a lonely female arrived first. The place seemed to appeal to her and she tried to induce friends to come with her. She would sit on the gable end and call vainly to them. Then, somehow, she succeeded in bringing a committee of investigation back with her. They swarmed all over the house, into all rooms, talking and criticizing and making comparisons. I gathered that one did not like the plumbing, some objected to the decorations, and others to the view, in fact none seemed satisfied enough to move in and after emphatic expressions of opinion all left; the single would-be tenant loudly protesting and vociferously calling them back. When she saw that they were actually deserting her off she flew after them and eventually brought them back for a fruitless reconsideration. Later she was joined by a mate—a juvenile or last year's male similar to herself in plumage—and they settled down to home-making by themselves. Through the brooding season friends from other colonies came and visited and it

was no uncommon sight to see ten or a dozen Martins taking an active and personal interest in the growing family, and when the young came out sometimes as many as twenty birds circled about the house. The next spring five or six pairs were in possession and the colony's welfare was established and has increased until, last summer, about twelve compartments were occupied.

As a rule, except where neighbouring colonies are broken up and made homeless, newly erected houses are filled by the overflow from neighbouring ones. Martins are conservative and probably as long as they can find satisfactory quarters in their ancestral mansion are loath to move to strange surroundings. The beginning of new colonies, therefore, depends upon the number of house-hunting birds in the neighbourhood.

SINGLE ROOM HOUSES.

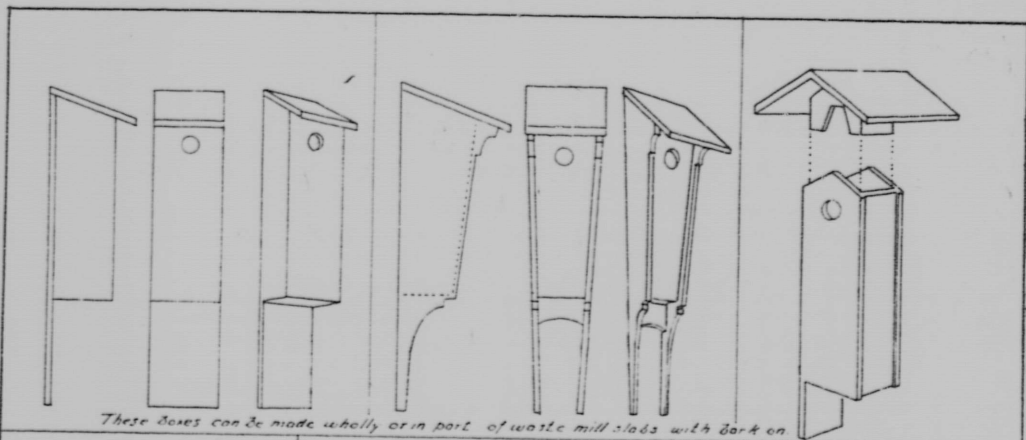
In the following table the birds that can usually be induced to occupy nesting boxes are listed and a schedule is given of their specific requirements. Various ideas as to the forms that may be adopted to fulfil these requirements can be obtained from the accompanying plates.

	Floor size inches	Depth inside inches	Entrance from floor inches	Diameter of entrance inches	House from ground feet
Purple Martin ..	6x6	6	1-1½	1¼	14-20
House Wren ...	4x4	6-8	1-6	⅞	6-10
Tree Swallow ..	5x5	6	1-6	1½	10-15
Blue Bird	5x5	8	6	1½	5-10
Crested Flycatcher	6x6	8-10	6	2	8-20
Chickadee	4x4	8-10	8	1⅞	6-15
Flicker	7x7	16-18	16	2½	6-20
Screech Owl....	8x8	12-15	12	3	10-30
Sparrow Hawk..	8x8	12-15	12	3	10-30

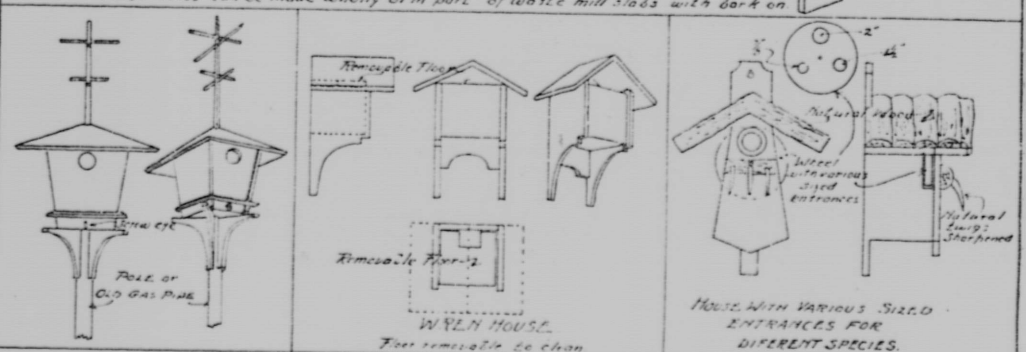
HOUSE WREN.

The bird most easily attracted to a bird house is the House Wren. Its tastes are so catholic as to raise the suspicion that it has no taste at all, or that it is so busy with other people's business that it is unmindful of its own. Anything that has an entrance and is hollow, that it considers safe from cats, and that can be filled with sticks, is taken on occasion—an old boot nailed up, a tin can, or even the pocket in an old coat have been repeatedly used. It is the only bird house that can be easily guarded from sparrows, for a small entrance ⅞-inch in diameter will serve the wren and keep pests out.

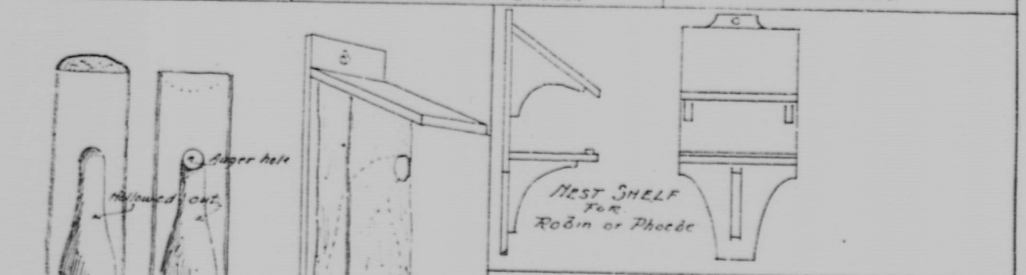
The House Wren is a busy mite and the wonder is that so small a body can contain such an amount of nervous energy. It may contain but it cannot hold it long, for every few moments it seems to



These boxes can be made wholly or in part of waste mill slabs with bark on

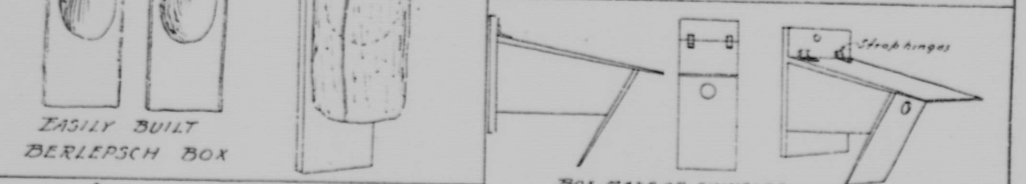


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By following this table of sizes the above boxes will suit any of the following birds

BIRD	HEIGH	DIAMETER	ENTRANCE	HOLES
PIE-BLIND CARLIN	6 x 6	4	1 1/2"	10-20"
HOUST WREN	4 x 4	6-8	1-2"	6-10"
TREE SWALLOW	5 x 5	6	1 1/2"	10-15"
BLUE BIRD	5 x 5	6	1 1/2"	5-10"
CRISTED WYANDOTTER	6 x 6	8-10	2"	8-20"
CHICKADEE	4 x 4	8-10	1 1/2"	6-15"
FLICKER	7 x 7	10-12	2 1/2"	6-20"
WRECC OWL	8 x 8	12-15	3"	10-25"
SPARROW HAWK	8 x 8	12-15	3"	10-20"

boil over with bubbling song with notes falling over each other in an attempt to get all out at once. It is a prying little busybody and not a nook or corner escapes its small inquisitive eyes and very little in the insect line its sharp, delicately tapered bill. Through the currant bushes it climbs and peers under every leaf, along every twig, then into the raspberr patch, down through the trellis and into the dark recesses of the phlox and larkspurs. The fence next receives its attention and every crack and joint is examined. Perpendiculars and horizontals, right side up and upside down are all one to it, gathering a worm here, a caterpillar there and spiders everywhere; and as it goes it scatters its bubbling song all over the garden. A flutter-budget and a Paul Pry, a busybody and a scold, but withal an important ally of the gardener.

I wish this were all I could say of it, but candor makes me issue a note of warning. If there are other small birds nesting near-by, watch the Wren closely. It is also a serious mischief-maker. This may be a trait of individuals, as there are rascals in all stations and walks of life. I hope it is, for Wrens have been known on more than one occasion to steal into the nests of other birds and puncture the eggs there. They do not eat the eggs, but seem to destroy them out of pure gnomish maliciousness. One is in a quandary whether to admire the little indefatigable caterpillar destroyer and merry songster or to wage war on it as a wanton destroyer and an enemy to husbandry.

TREE SWALLOW.

The Tree Swallow is dressed in a panoply of gleaming steel and white. All above is iridescent black with snowy white below. The female is similar, but with colours less pure and gleaming. Normally the Tree Swallow nests in old woodpecker-holes, in dead trees, preferably overhanging water, but always in the open. Its sweet little "*chink a chink*", like water dripping into a quiet pool, is a pleasant sound and the gleam of its wings in the bright sun adds a most attractive presence to the garden. It has no bad faults that I have discovered and the number of insects it takes is considerable. The house should be on a pole in the open and from ten to fifteen feet up, though greater heights are not necessarily objected to and the box can often be set up from the house top if no more intimate situation is available.

BLUEBIRD.

John Burroughs has described the Bluebird (the eastern species) as "The sky above and the earth beneath", and the description fits it perfectly. All above is iridescent cerulean blue and the throat, breast and most below dull earthy red—"the good red earth". It is another bird above reproach and the

brilliant coat of the male, its mate's more subdued colours, its pensive notes, "*purity, purity*," and its modest liquid warble are additions to any landscape. Its nest requirements are quite similar to those of the Tree Swallow, except that it does not nest as high, often occupying holes in old fence posts not five feet from the ground and it is not specially partial to the vicinity of water. I advise every one to get a Bluebird to nest in the garden whenever possible. I have not succeeded in doing this yet, but in the less urban situations it should not be a difficult species to entice.

CRESTED FLYCATCHER.

About the size of a sparrow but with a longer tail. Wood browns above with a slightly reddish tail, grey throat and breast, and pale lemon yellow below; sexes alike, combined with a number of peculiar but not inharmonious whistles, these are the characteristics of the Crested Flycatcher. It is not very often that it comes to nesting boxes, but the unexpected sometimes happens and the writer has had this bird in his garden for two years—not consecutively. The first year of the Martin colony, when it consisted of only a single pair, Crested Flycatchers occupied the wing of the house opposite the Martins. Battles royal occurred constantly, but one was as stubborn as the other and both remained. With a larger colony of Martins the Flycatchers would have stood little chance. The Flycatcher's box should be ten to twenty feet up and if it is partly sheltered by trees as on the edge of a grove it will more closely approximate the natural habitat.

FLICKER.

The Flicker is a woodpecker and about as large as a robin. Valuable for itself it is still further useful as a provider of nesting holes for innumerable other birds. In fact the greater number of our hole-nesting birds, unable to excavate for themselves, are largely dependent upon holes made and abandoned by the Flicker. A Flicker box should closely approximate the nest he makes for himself—the Berlepsch type hollowed out of a section of solid wood is the best. He is perfectly able to make his home for himself and is, therefore, not bound to accept such makeshifts as other species are sometimes forced to put up with. It will be noticed by referring to the drawings that the cavity is gourd or flask-shaped with a round bottom. This type is not difficult to make. A section of natural trunk is first split and the two halves hollowed out with chisel and gouge to match and then firmly nailed together. A board on the top forms an entrance shelter and prevents rain from draining down the joint. The nest should be placed rather high, preferably facing outward from the edge of a tree or trees.

SCREECH OWL.

The Screech Owl is not a common habitant of our gardens, but it is often found nesting in neglected orchards where hollow trees give opportunity. It is a small owl, not greatly exceeding a robin in size, but of apparently greater bulk on account of its heavier build and more fluffy feathering. Its colour may be a fine pattern of either ash grey or burnt sienna red, with prominent ear tufts and yellow eyes. It is carnivorous of course, and undoubtedly takes a certain number of small birds, though mice form its principal fare. On the whole, it is much more a friend than an enemy of man. It may sound inconsistent to allow a bird of prey to build in the garden, much more to advocate building a nest box for it, but it is an attractive little fellow with many pretty ways. It is a gross libel to call it "screech" owl for whatever its song is it is not a screech, but a very pretty whistled tremolo, and as soothing a sound as can be imagined. If one can be induced to stay within easy hearing distance from the house, its many other conversational themes will well repay the listener for his attention and will add an interest to the night that other bird voices give to the day. But if the owl interferes with other song birds? Well, it is mostly after mice and prefers them when it can get them; besides Martins, and other birds that can be coaxed into boxes, are probably safe inside when the owl is hunting. I would really hate to have to choose between a Screech Owl and the other birds—Martin colony excepted of course. Almost any one can have wrens and swallows in the garden, but the presence of a Screech Owl gives a cachet of distinction that I would hesitate to relinquish. To fall asleep at night to the love making song of the Screech Owl, to be awakened in the morning by the pleasant gurgles of Purple Martins and pass the day to the songs of wrens and voices

of Tree Swallows makes a modern commonplace garden approach in some degree at least that from which we are supposed to have fallen.

SPARROW HAWK.

The Sparrow Hawk is hardly to be classed as an inhabitant of the garden. The smallest of our hawks, scarcely larger than a robin, and the brightest coloured of all our raptors, the blue blood of the falcons runs through its veins. Such a bird cannot be expected to confine itself to the formal restrictions of suburban life. Its home is the open fields, and there it combats grasshoppers and mice in true knightly fashion. Its chateau is in some high flung limb of a tall dead tree. As a nobleman of the old regime it cannot be expected to descend to the manual labour of the carpenter's and mason's trade, but inherits its residence from that useful commoner the Flicker, in whose abandoned or pre-empted stronghold it raises the cadets of its line. With all its nobility or perhaps because of it the Sparrow Hawk is still man's humble though often misjudged friend and it slays the grasshoppers and small mammal dragons of husbandry without let or stint. Though in the east there is probably little need to erect special quarters for it, as its natural habitat is still well supplied with suitable stubs, on the prairies of the west such accommodation is lacking, and it is often driven by necessity to occupy such prosaic sites as telegraph poles. Think how hard pressed a noble falcon must be to descend to such plebeian usage; but *noblesse oblige*, and for the sake of the family line pride is swallowed. In such localities it is a sentimental and esthetic as well as an economic duty to provide this brave little fellow with facilities in keeping with his needs and traditions. The Berlepsch house is the best type and it should be erected as high as possible, over or near what shrubbery is available.



INSECT GALLS AND GALL INSECTS.

By E. P. FELT, ALBANY, N.Y.

Insect or plant galls are the obvious and manifold deformities found upon all parts of a great variety of plants and usually given only a passing thought. Gall insects are the inhabitants of these insect or plant galls and, like the deformities themselves, are myriad in number, variety and structure. Insect galls are easily studied, since they are to be found at all seasons of the year and are readily located and preserved. Conversely, while gall insects exist throughout the year and in various stages, practically, it is difficult to obtain them except after some knowledge of their habits and the conditions which are necessary to complete their changes or transformations. Many issue direct from their galls and are easily reared, others enter the soil for the final transformations and are difficult to rear.

The oak apples are moderately common plant galls, occasionally being so numerous as to occur by the hundreds upon favoured trees. They are spherical, an inch or so in diameter, depend from leaves or twigs and are easily crushed. These curious developments are comparatively well known, though the little four-winged gall wasps issuing therefrom are very rarely seen by other than the professional entomologist. It is not so generally realized that there are over 350 different galls produced by various gall wasps upon our oaks and moreover that considerable series of these insects exist in two very different forms, namely, a perfect or complete generation, represented by males and females and usually appearing in midsummer or when warm weather is very favourable to insect activities, and the imperfect or incomplete generation, represented only by females, which issues from a very different gall, usually in early spring at a time when cool, inclement weather seriously restricts insect activities. This remarkable difference between parent and offspring is known as alternation of generations and may be summarized by the statement that it means dissimilar children and similar grandchildren. The great difference obtaining between the two generations is illustrated by a British oak apple which develops on the tips of the twigs and produces four-winged gall flies, whereas the alternate generation issues from masses of somewhat fig-shaped root galls and is wingless. In other words, the wingless insects issuing from root galls climb the trees to the tips of the twigs and those developing in galls at the tips of the twigs, although provided with wings, descend to the ground and make their way to root-lets before they deposit eggs. It is an interesting

migration from one extremity of the tree to the other. The peculiar relationship existing between many of the oak galls has been worked out for the European gall wasps, though as yet little is known concerning our very numerous American forms. It is not so very difficult to ascertain this, since it is only necessary to collect the mature galls, keep them under approximately normal conditions in a jar or other cage and when the flies appear give them a chance to follow their instincts under as nearly natural conditions as possible, or better still, if small oaks be in the vicinity, watch the behaviour of the gall wasps as they issue in the open, using those in the cage to indicate the time when observations can be made to the best advantage. Naturalists with nearby scrub oaks have an almost ideal outdoor laboratory for such work.

There appear to be more special adaptations among gall making insects than are found in most other groups, though it should be remembered that the gall makers are by no means a natural group, since representatives of several dissimilar orders of insects have acquired this habit. The alternation of generations in the gall wasps is closely paralleled by what is found in certain plant lice, except that with these we have an alternation of indeterminate series of generations, their extent being determined largely by seasonal conditions and the vitality of the food plant. Moreover, in this group, the alternate series of generations are very likely to develop upon such dissimilar plants as birch and witch hazel. Certain species of gall midges have a very similar development except that there is an indeterminate series of generations remarkable in that maggots continue to produce maggots (that is pupæ and adults are eliminated) and then eventually a generation continues its development to the perfect flies and these latter behave as other insects. The reason for this remarkable deviation from the normal appears to be due to the fact that these maggots subsist upon decaying wood and develop in places where neither flies nor parasites can penetrate readily, consequently a series of maggot generations gives an advantage which would not obtain if the insects were compelled to transform to flies and emerge in the open from generation to generation.

Insect galls, as intimated above, are simply abnormal developments of plant tissues. A little study of these deformities reveals surprising modifications. There is the comparatively simple swelling of catkin, leaf, leaf stalk, twig or root containing



DIFFERENT TYPES OF GALLS: A. Linden mite gall, sometimes very abundant on basswood leaves, note the varied forms. The interior is inhabited by microscopic plant mites. B. Maple spot gall, a yellowish-red margined gall, very common on soft maple; at the centre there is an almost transparent maggot. C. Bud gall on the western-rayless goldenrod, note the protecting brush of plant hairs shown in the enlarged section. D. Goldenrod ball gall, very common, each inhabited by a large stout yellowish-white maggot. E. Cypress flower gall, a peculiar whitish flower-shaped growth sometimes very abundant on the twigs. F. Cockscomb elm gall, a deformity produced by a plant louse and occasionally very abundant on small trees, the slit-like entrance on the under surface of the leaf is shown in the upper right-hand figure. G. Downy flower gall, sometimes very abundant on goldenrod. H. Witch hazel cone gall, a greenish or reddish gall, sometimes very abundant and produced by a plant louse.—(Author's illustrations, Scientific Monthly.)

one or more maggots, each in a small oval cavity or cell. Many of these deformities have the surface clothed with wool-like hairs, really modified and greatly developed plant hairs. This is carried to an extreme in the spherical masses of delicate, creamy-white hairs with pink spots caused by the wool sower. This mass, beautiful because of its wonderfully delicate tints and deceptively heavy, is really nothing but many deformed buds, each cell containing a maggot and united to those around by the greatly developed plant hairs. Some of the leaf galls, aside from the distinctly wooly ones, present extremely interesting modifications in that the plant hairs are modified to form more or less well developed spines, as for example in the yellow sea urchin and some of its allies, with their peculiar ornamentations and often striking coloration. A few galls show this development to an even more striking degree and are variously and sometimes grotesquely angled or spined. There is an apparently uninteresting succulent oak gall which is very deceptive since it is hollow and most remarkable of all the cavity contains a free rolling oval cell in which the gall maker is securely ensconced. It is literally a "high roller".

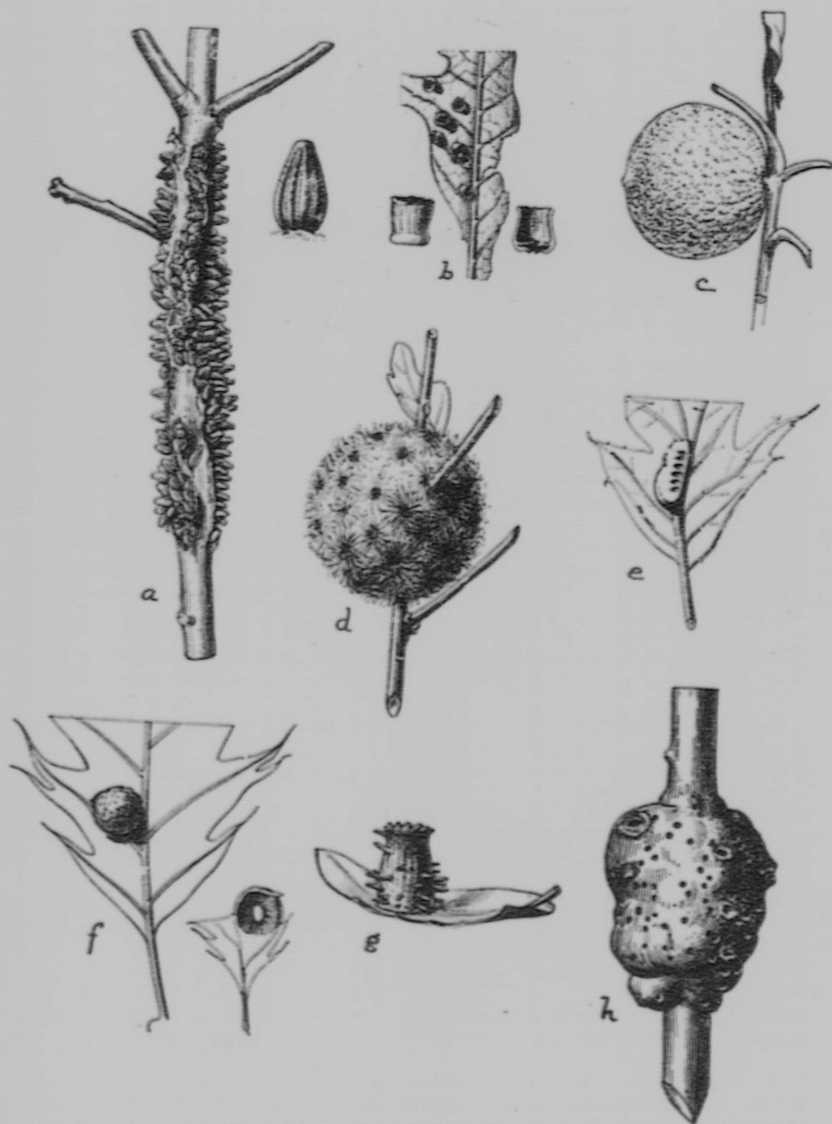
Nature delights in camouflage or mimicry. The cypress flower gall is a striking instance of this tendency to simulate even in places where nothing of the kind would be expected. The pretty little gall with its delicate tints, suggests for all the world one of the smaller flowers, despite the fact that it occurs upon cypress, a tree which produces no such flowers as are found among the other plants. This deformity is produced by a little gall midge and occasionally is so very abundant as to fairly dot good sized limbs with its pleasing combination of colour and form.

The relation of the gall insect to the plant upon which it subsists is worthy of careful consideration. The gall insects are fragile, minute and in many cases with restricted powers of flight, some even being wingless. Nevertheless, hosts of species manage to exist in the face of these limitations and in some cases it is known that a colony may remain year after year for a considerable series of years upon one or two relatively isolated bushes. A very considerable proportion of these gall insects must attack some part of the plant when it is growing rapidly, and usually in early spring when the tender tissues are literally rolling out of the buds and are in a most plastic condition. It is very probable that a considerable series of globular or variously shaped galls on the surface of leaves originate when the foliage is still in the bud. The wide scattering of some of these growths is simply due to the expanding tissues after the young gall insect has established

itself upon the developing leaf. But infestation is characteristic of a considerable series of gall midges, notably the peculiar forms producing variously shaped galls upon the surface of both hickory and oak leaves and as mentioned earlier, it is also true of a considerable series of the gall wasps. Were we to search carefully for an explanation of the peculiar alternation of generations mentioned above, we would probably decide that the appearance of this early spring, incomplete generation justified itself not only because all of the individuals were able to deposit eggs, but also on account of the fact that these eggs were deposited in the buds and therefore the young could develop under the best possible condition, due to the soft, plastic state of the leaves and catkins. In other words, alternation of generations is a modification which has enabled gall wasps to maintain themselves in large numbers, and an additional reason for believing this is seen in the fact that species presenting this marked deviation from what we usually find among gall insects are extremely abundant. It is one of the most striking of the numerous interrelationships occurring between insects and plants.

The mysterious and enchanting adaptations of gall insects are by no means completed with the above recital. Some of our plant lice exhibit equally interesting relationships. The galls of these insects are invariably recognized by the more or less distinct orifice and then there is usually a considerable cavity inhabited sometimes by one insect, frequently by more and occasionally the aphids are so numerous as to completely cover the entire interior so that a gall, when opened at this time, presents a striking resemblance in miniature to the geode. How is this strange modification brought about? Those who have studied louse galls state that in some cases at least, the parent insect simply establishes herself upon the leaf stalk, commences feeding and as a result of continued irritation, the plant appears to be compelled to develop an abnormal mass of cells which literally grows up and encloses its enemy. There is, of course, with this development of the plant, an increase in the number of the insects, so that eventually, conditions are as described above. Some of the jumping plant lice, rather closely related to the aphids just mentioned, are nearly as dependent upon hackberry as certain gall midges and gall wasps are upon oaks, and we find among these jumping plant lice not only a series of species upon a favored food plant but also an equally large series of galls, each with its peculiar structure, at least within certain limits.

These are not the only interesting relationships between insect galls and gall insects. There are also a number of species which take advantage of



CHARACTERISTIC OAK GALLS: A. Bud-like galls on oak twigs, sometimes very abundant and since they produce a sweetish fluid, hests of bees, flies and other insects may be attracted in early summer. B. Oak spangles, produced by a gall midge, note the cup-like shape and the little oval cavity at the base, shown in the illustration of a sectioned gall. C. Large oak apple, one of the more common and striking galls produced by gall wasps. D. Gall of the wool sower, a delicate appearing white, pink-marked woolly growth containing seed-like cells, each inhabited by a white maggot. E. Mid-rib tumor gall sectioned to show the series of cells inhabited by the white maggots. F. Small oak apple, the one in section shows the characteristic central cell inhabited by a maggot and supported by numerous radiating fibres. G. A peculiar cylindrical-spined, rosy red, yellow-banded gall on a western oak. H. Gouty oak gall, a large swelling frequently forming head-like enlargements on most of the smaller branches of various oaks, large trees sometimes being badly infested.—(Author's illustrations, Scientific Monthly.)

the activity and enterprise of gall insects and depend like the cuckoo among birds upon others to provide suitable conditions for their young or even go farther and actually prey upon the true gall producers. The former is carried to a very high degree of perfection in the case of the gall wasps, since the gall "cuckoos", if we might coin a word, resemble the rightful owners of the gall so closely that it is very difficult to distinguish one from the other. Apparently the same thing exists, though to a more limited extent, among some of the gall midges and there are cases where it appears quite probable that a plant deformity of a given character may be produced by more than one gall midge, each performing its fair share of labour in the development of a common shelter. The enemies of the gall insects, generally termed parasites, are occasionally so numerous that comparatively few of the gall producers attain maturity. They are natural checks and when it comes to discussing the ethics of life, it is a little difficult to draw any satisfactory line

between the gall insects, real parasites upon plants, the associates or cuckoo-like species which subsist at the expense of these plant parasites or the parasites of the gall insects, since they are all engaged in wresting life from other forms of life.

The above gives a little idea of the extraordinary interest attaching to insect galls and gall insects. There are in America, something like 1,400 different species and a considerable number await discovery in practically all parts of the country. Man has an innate love for nature and anything which will bring the individual into closer touch with the verities of life is a distinct gain for the human race. The hunting of animals, the study of birds, the collection of plants, are all manifestations of our love of nature. These are excellent recreations and comparatively well known. Insect galls and gall insects offer a large, accessible and relatively unknown field for the student of natural history, which can be entered to advantage by a very large proportion of amateur and professional naturalists.

BOOK NOTICES AND REVIEWS.

INTERESTING SEASONAL DATA.—In the *Migrational Bulletin* issued by E. H. Forbush, Ornithologist to the Commonwealth of Massachusetts, No. XI, dated Nov. 15, occurs the following:

"The autumn has been remarkable. Although there were many rains in September, most of the storms were warm and the season has been so mild and open that not only have fall flowers escaped the frost, but spring flowers and fruits have developed. Wild strawberries, raspberries and blackberries were ripening late in October. Many lawns, mowing fields and pastures still retain their green verdure. From the Berkshire hills to the Atlantic coast the trailing arbutus bloomed late in October, and the common dandelion blossomed again in many localities, besides the fall species, and in some cases it seeded for the second time this year. Both spring and fall dandelions were blooming the first week in November. Willow catkins are now (Nov. 15) open in eastern Massachusetts, and a few flowers still bloom in some gardens.

The effect produced upon the birds by such spring-like weather was what might have been expected. Not only did many of them sing in the usual subdued autumn tones, but some apparently gave their full spring songs. Even the flight songs of several species have been reported, and the singing of robins, song sparrows and some other species continued well into November. The mild weather seemed to delay the departure of some individuals of several species, and to bring about dilatory movements of the waterfowl."

Though the above writer may be mistaken in ascribing this late floral and fruiting activity to unseasonably mild weather, the facts of the case are interesting, especially the ornithological ones and it would be well for us to see just how widely these conditions and phenomena extended during the past autumn.

Late fall blooming of spring plants is not a very uncommon occurrence,* almost every season a few violets can be found here and there in the woods. Bloom on such plants occurs only immediately after awakening from a period of dormant quiescence such as is effected normally by the cold winter season, but a prolonged drought in summer will produce a similar effect and it can be artificially produced by florists by the use of narcotics, anesthetics or other more simple means of inducing unseasonable rest which will be followed by the production of bloom. Without doubt, the unusual amount of fall blossoming here reported was induced by a previous dry spell followed by wet that deceived the roots into the belief that a new spring had come. It will probably be found that in every such case it is the future that has been drawn upon, that next spring's flowers have been expended and the coming season will be one without floration and sterile for the misguided individuals that bloomed at the wrong time.

*See Cephas Gullet, On Autumn-flowering of Various Wild Plants in 1900; *Ottawa Naturalist*, XV, August, 1901, pp. 122-126, in which a number of such cases are noted, though ascribed as above to unusually mild weather.

The singing of the birds is not to be explained by any such previous dry season though it may have been influenced by the unusual supply of spring food. It is now pretty well known that food has a considerable influence upon the seasonal activities of birds and under abnormal conditions enough sexually exciting food might have been produced to induce a limited effect in this direction.

That migrations should be disorganized by an unseasonable mild spell is to be expected. Some birds are greatly influenced by weather conditions, usually early spring and late fall migrants, whilst others coming and going long before actual need of migration is evident to us, migrate irrespective of early or late seasons and can be expected to appear and disappear with almost calendar-like regularity year after year.

P. A. T.

In THE CANADIAN BOY, Vol 1, Sept. 1918, p. 127, appears "The Naturalist's Nest," conducted by R. W. Tufts, Wolfville, N.S.

An albino robin is reported and described; then follows a discussion on the various eastern species of hawks in which the sheep are weeded from the goats in a manner that is satisfactory to the naturalist and interesting and instructive to the Boys (Scouts) in whose interest the periodical is published. The only point of criticism the reviewer feels like mentioning is evidently an accidental omission. It says of the Cooper's Hawk that it "is much like the Goshawk in appearance and general habits" without calling attention to the fact that the similarity of appearances only holds through the juvenility of the species, that in the adult plumage the two are as different in color as they are in size.

It is the firm opinion of the writer that the most practical method of educating the public in the economic and other value of birds, especially those against which there is a strong popular prejudice, is by appealing to the young and growing mind. It is most difficult to redirect established currents of thought, but the boy becomes a man within a few years and early impressions influence the whole after life. Such departments as this in juvenile literature are to be encouraged in every way. The history of great movements in modern times seems to indicate that it is only after several generations that fundamental changes in established thought and ideals can take place. The first generation view a radically new thought with suspicion, the second to whom it is not new endures and succeeding ones embrace it on its merits. Let us by all means get after the children at once.

P. A. T.

In the *Auk* for October, 1918, are several papers of interest to Canadian ornithologists.

NOTES ON NORTH AMERICAN BIRDS (pp. 463-467) is the title of a paper by H. C. Oberholser in which is discussed several subspecies of Canadian occurrence.

The Northwestern Belted Kingfisher, *Streptoceryle alcyon caurina* Grinnell (questioned by Taverner), is regarded as a valid race. The American Barn Owl is relegated to subspecific status with the European form, under the name *Tyto alba pratincola* (Bonaparte). Hellmayr's proposal to include the American Brown Creeper as a form of *Certhia brachydactyla* Brehm is rejected. The Alaska Myrtle Warbler, *Dendroica coronata hooveri* McGregor, is accepted as a recognizable subspecies. Brook's proposal of the Hoary Redpoll, *Acanthis hornemanni exilpes*, as a subspecies of the Common Redpoll, *A. linaria* instead of *A. hornemanni*, is rejected.

THE SUBSPECIES OF LARUS HYPERBOREUS Gunnerus by H. C. Oberholser (pp. 467-474). This paper investigates the hitherto rejected Point Barrow Gull, *Larus barrovianus* Ridgway, and decides that it is a recognizable race of the Glaucous Gull, *L. hyperboreus*, differing particularly in being smaller than the Atlantic form. He gives diagnosis, measurements and distribution, extending the latter as far east on the Arctic coast as Franklin Bay.

In the department of Recent Literature, W. S. Stone (pp. 486-489) reviews Dr. Dwight's Review of the Juncos at considerable length. Further on under Correspondence, Jos. Grinnell (pp. 505-507) has more to say on the same subject and it may be well here to mention that the paper is also reviewed in the *Condor*, July, 1918 (pp. 142-143), by H. S. Swarth. Further remarks occur on the same paper elsewhere in these pages.

Soper's Birds of Edmonton, OTTAWA NATURALIST, February and March, 1918, is mentioned in review (p. 489).

The Possible Avian Distribution of Hog Cholera, *Journ. Agr. Research*, Vol. 13, 1918 (pp. 125-129), is summarized (pp. 495-496) and the resulting conclusion cited that pigeons and other birds of similar habits are probably never concerned in the spread of the disease.

In the department of General Notes, Cause of "Fishy" Flavour of the Flesh of Wild Ducks", W. L. McAtee (pp. 474-476). The decision is reached that the "fishy" flavour should probably be ascribed to the physiological condition of individuals rather than to the use of fish as food and it is asserted that many noted fish-eating species may be unexpectedly palatable.

FLIGHT OF HORNED OWLS IN CANADA by J. Dewy Soper, Preston, Ont. (pp. 478-479). In this the author observes that whilst the above species were unusually abundant in October and November, 1917, at various points in southern Ontario, they were abnormally scarce in the country north-east of Lake Superior where they are usually common.

P. A. T.

THE GEOGRAPHIC DISTRIBUTION OF COLOR AND OTHER VALUABLE CHARACTERS IN THE GENUS JUNCO; a new aspect of Specific and Subspecific Values. By Jonathan Dwight, M.D. Bull., Amer. Mus. Nat. Hist. Vol. XXXVIII, pp. 269-309, June, 1918.

Whether one does or does not agree on every point with the author of this paper, it must be regarded as an important contribution not only to the difficult subject of the genus to which it refers, but to zoology in general and ornithology in particular. In it Dr. Dwight offers a new solution to the confusion of differentiated forms of this highly variable group, and attempts to point out a way in which like problems can be simplified in other departments of zoology.

He cuts the gordian knot of the multitude of intergrading subspecies by raising several of them to full specific rank and regarding the intermediates as hybrid. As criteria between specific and subspecific variations he divides them into qualitative and quantitative characters; qualitative characters being new qualities, or characters, and hence specific in value and quantitative being an increase or reduction of quantity in qualities or characters already existing in the parent form and hence of subspecific value only. This is to replace the older hypothesis that species are wholly isolated units and that intergradation between extreme variations are proof of this subspecific relationship. It must be acknowledged that this is largely according to the trend of modern thought which is coming to regard the specific unit of systematists with growing distrust and as an unstable division. Whilst this view from a paleontological standpoint is unassailable the writer cannot but regard it as being misplaced in considering modern zoological problems. Through geological time species are uncertain if not fluid quantities flowing imperceptibly one into the other, but at any one given moment of time through any given geological horizon I cannot see how we can refuse to recognize their individual isolation from contemporary forms, without making confusion worse confounded and destroying our perspective of current events. The fact that species may be extremely variable within themselves and on the point of giving rise to new ones is not sufficient ground for rejecting the specific concept altogether.

Whether or no we can frame a satisfactory definition for the species does not alter the specific fact, it merely indicates upon the limitations of our present knowledge. The fact that hybrids (as usually understood) between acknowledged species are usually rare, but constantly occur without swamping or mongrelizing the species seems evidence that the unit is a real one and not a figment of the imagination.

Dr. Dwight's distinction between quantitative and qualitative quantities seem subject to the question, which is which? He regards the black head and the red back of *J. oregonus* as qualitative, yet the gray head of *hiemalis* is but a reduced blackness, and the red back of *oregonus* but the persistence and increase of a color present in juveniles of the opposite race. It does not seem that these characters offer any better or perhaps as good a means of specific determination as those heretofore applied.

The characters of Dr. Dwight's hybrids also seem to lack the appearance logically to be expected in such individuals. True hybrids between specifically distinct forms usually show pie-bald mixtures of parental characters seldom even blendings of them. Our finest example of this arises from the crossing of the Red and the Yellow-shafted Flickers. These species hybridize most freely and the resultant shows if not in the first generation at least in the succeeding ones, a bewildering array of mixed pure characters in every possible combination, rarely a blending of them. Thus the moustache mark may be black or red or red and black, but rarely if ever, brown, which would be half-way between and a blending of the two. Dr. Dwight's hybrids on the contrary are all perfectly even blendings, one form imperceptibly gliding into the other, with very little reversion to pure parental characters. The very constancy of each type also raises a certain amount of suspicion. In every character true hybrids should show dominant, recessive and mingled resultants in such varied combination that duplicate individuals are the exception, not the rule. Dr. Dwight's postulated hybrids, however, are as constant in type as they are in blending. On the whole, while we admire Dr. Dwight's serious purpose and the amount of concentration he has brought to bear upon the subject, it does not seem that his attempt to form new standards of specific relationship will be more acceptable than the old ones.

In untangling the relationships between these confusing forms, however, the author has rendered a great service. Whilst his explanation of the causes may not be entirely acceptable, the facts he has brought out have probably simplified the subject considerably and in the light of his painstaking re-

searches we are in a much better position to elucidate the snarl. I have not the space in which to go into the details of his many valid conclusions, but

must refer all who are interested in the genus *Junco* to the paper itself.

P. A. TAVERNER.

NOTES AND OBSERVATIONS.

RE SIGHT IDENTIFICATIONS.—The following is from the pen of that veteran ornithologist, Wm. Brewster, whose status as Dean of American ornithology is unchallenged. It appears in his *Birds of the Cambridge Region*, *Memoirs of the Nuttall Ornithological Club*, No. IV, Cambridge, Mass., 1906, Preface, pp. 5-6.

"My early training and experience have lead me to believe that with certain exceptions to be specified, the occurrence of birds in localities or regions lying outside their known habitats should not be regarded as definitely established until actual specimens have been taken and afterwards determined by competent authorities. No doubt it is becoming more and more difficult to live up to this rule because of the ever-increasing and, in the main, wholesome, popular feeling against the killing of birds for whatever purpose. Nevertheless I cannot admit that the mere observation of living birds met with in localities where they do not properly belong, or where they have not been ascertained to occasionally appear, should often be considered as establishing anything more than possible or probable instances of occurrence—according to the weight and character of the evidence."

"Exceptions to the rule may and indeed *should* be made in the cases of species which like the Turkey Vulture, the Swallow-tailed Kite, and the Cardinal, are easily recognized at a distance and which are reported by persons known to have had previous familiarity with the birds in life. Sight identifications of species somewhat less distinctly characterized than these just mentioned, if made under favourable conditions by observers of long field experience and tried reliability, may also sometimes be accepted with entire confidence. But on no authority, however good, should a mere field observation of any bird that is really difficult to identify, be taken as establishing an important primal record."

It may also be said that Dr. J. A. Allen, another of our old veterans of ornithology whose standing is beyond question, in reviewing the above work in the *Auk*, XXIII, 1906, p. 470, heartily endorses the above. After quoting the substance of the above, he remarks:

"This is the basis of the author's rulings in the present paper—a proper and the only safe basis in view of the present day method of numerous amateur observers, who are too often burdening ornithological literature with ill-advised records."

It may be added that the editorial policy of THE OTTAWA NATURALIST agrees heartily with these sentiments. We ourselves have many sight records which we are morally certain are correct but without specimens, except under the most exceptional circumstances, we do not feel justified in publishing them as more than hypothetical and then only with as many details in substantiation as possible that the reader may judge for himself of their sufficiency.

P. A. TAVERNER.

ORIGIN OF PLACE NAMES IN OTTAWA VALLEY.—I was much interested in the note by Mr. Douglas in THE OTTAWA NATURALIST for November, 1918, regarding the origin of the name Gatineau as applied to Gatineau River. While a very reasonable conclusion as far as it goes, there still seems to me some reason to doubt the connection between cause and effect in this case, owing to the vagueness of the proof that Monsieur Gatineau ever reached the river said to be named after him.

This doubt of mine is strengthened by the fact that I was given a very different derivation of the name by the late Mr. Lindsay Russell, who was for many years Surveyor General for Canada. He had an intimate knowledge of all the Ottawa tributaries, particularly the Gatineau and their peoples and to my personal knowledge a very considerable familiarity with their language.

He told me that the name Gatineau was Indian, that it was derived from the Cree word *Etinos*, meaning "The People"; i.e., the people of any particular district, and means "the river of the people", who lived in its territory. Might not this to some extent account for the Wright's spelling it Gatineau.

He also told me that one of the large tributaries marked on the map as Jean de Terre was wrongly so marked, as the original name was "Les Gens de la Terre" and was a literal translation of the name of the main river.

As to the G. sound beginning the name, anyone who is interested in Indian languages knows how prone they are to throw around their consonants loosely, as witness Mitchi, Kitchi, Gitchi, each meaning great, or grand, and Nippi, Tibbi, and Sibbi, a body of water, and all in use in the same district. This was probably due to the language not being a written one.

ARMON BURWASH, ARNPRIOR, ONT.

NOTE ON TURTLES.—I venture to point out some inaccuracies that have crept into Mr. Thompson Seton's comments on Turtles in the November number of THE OTTAWA NATURALIST.

The eggs of the Eastern Painted Turtle can scarcely be described as "nearly round"; they are decidedly elongate in shape. The number to a nest in this district is from eight to ten. I have no exact data on the incubation period of the Painted Turtle, but have reason to believe that—in the Ottawa Valley at least—it is much longer than two weeks. In the statement Mr. Thompson Seton quotes from Agassiz: "The Painted Turtle has an almost identical period of incubation with the Snapping Turtle, namely, from the 11th to the 25th June", the word "incubation" is evidently a mistake for "oviposition". Both turtles lay about the middle of June, but the young of the Snapping Turtle certainly do not emerge from the shell until September or October; and even then, as far as my experience goes, they remain buried in the sand until the following spring.

Again, the egg of the Snapping Turtle is not "less round" than that of the Painted Turtle, for it is perfectly spherical. And the number of eggs to a nest may often be as many as fifty. Five nests of which I have record contained respectively 39, 45, 49, 50 and 51 eggs. Half a dozen other nests not so carefully counted contained manifestly similar numbers. I have never seen a nest with as few as two dozen eggs in it.

C. MACNAMARA, ARNPRIOR, ONT.

ADDITIONAL NOTES ON MANITOBA TURTLES, SNAKES AND BATRACHIANS.—Mr. Thompson Seton has provided us with a very useful contribution in the November number of THE OTTAWA NATURALIST which every Manitoban interested in wild life will appreciate. A residence of more than thirty years in the province enables me to add a few facts which are presented below.

The Western Hog-nosed Snake, *Heterodon nasicus* B. and G. It is rather surprising that this interesting snake has not been recorded. It was taken by my father, Percy Criddle, in about 1884, and has since been observed on many occasions at Aweme and surrounding places. A very fine example was presented to me, as a rare insect, in a net, some years ago by that friend of every young naturalist, the late Dr. James Fletcher, who in company with Mr. J. B. Wallis captured it in the sand hills near Onah. This snake's habit of shamming death is well known. Among those unacquainted with its harmlessness it is credited with being a "puff adder" giving forth a deadly vapour from its

mouth, this being supposedly demonstrated by the habit the snake has of flattening itself out while hissing. There are probably few reptiles that can show a bolder face and yet are so little able to put their threats into practice.

The Garter Snake is one of those that protects its young by taking them into its mouth. Naturalists used to be sceptical as to this acclaimed habit, which is a fact nevertheless. The practice has been witnessed more than once by us in Manitoba.

In addition to the Hog-nosed Snake we have at least one Swift, *Sceloparus* sp? which inhabits wet or low lands.

The Mud-Puppy, *Necturus maculosus*, occurs in all the rivers of southern Manitoba, being probably much commoner than is generally supposed, as the examples taken are usually secured on a fish-hook.

The distribution of the Snapping Turtle, *C. serpentina*, is also of considerable extent along rivers and I have seen examples as far west as eastern Saskatchewan in the Souris river.

On July 10, 1918, I came across a large example of the Painted Turtle, *C. marginata bellii*, which had crawled over a wide extent of sand in search of a "nesting" site. It was at rest on some ground juniper, *J. procumbens*, when secured but no indications of a "nest" were visible. The turtle was fully a mile away from the nearest water, the Rice lake, Onah, and had been obliged to climb various steep hills in her journey towards the sand.

NORMAN CRIDDLE.

RAILWAYS IN THE OTTAWA VALLEY.—Respecting Mr. Keele's articles on the "Location of Towns and Villages in the Ottawa Valley", printed in THE OTTAWA NATURALIST, November, 1918, Mr. James White, of the Commission of Conservation, points out that: The first railway line into the Ottawa valley was the Prescott and Ottawa, or, to use the original name, the Prescott and Bytown railway. This line was opened for traffic December, 1854. The Brockville and Ottawa, later, the Canada Central, was opened from Brockville to Almonte in August, 1859, and the branch from Smith's Falls to Perth was completed in February of the same year. The extension from Almonte to Sand Point was completed prior to 1867.

Later, a line was constructed from Carleton Place eastward to Ottawa, and the line to Almonte was extended northward to Pembroke via Pakenham, Arnprior and Renfrew.

The Canadian Pacific purchased the Canada Central in 1881, and included the portion of this line from Ottawa to Pembroke in its transcontinental line, thereafter operating the portion between Carleton Place and Brockville as the Brockville branch.

A MANITOBA LIZARD.—I have been very much interested in Seton's List of Turtles, Snakes and Batrachians of Manitoba. The following may be of interest:

On June 15, 1918, Mr. McIntosh, from the staff of the city schools here, and I made a trip to the big larch swamp about 15 miles east of Brandon. In order to prevent fire running we chose a site in a gravel pit in which to build our fire for dinner and I threw my coat on the hot sand while we were preparing the meal. When I came to look at it there was an undoubted lizard basking in the sun on top of the coat. It would be, I should say, about seven inches long, striped and somewhat bronze in color, rather darker than I have usually seen in what I took to be the same species in the East. I suppose it was *Sceloporus undulatus*, or what in Ontario we called the Swift. I wanted to secure it but we thought we would take a description first and while Mr. McIntosh was looking for his book it darted into the folds of the coat and the most diligent search failed to locate it.

B. J. HALES, BRANDON, MAN.

ON THE CHUB MACKEREL (*Scomber japonicus*). A specimen of this species of fish was lately received from the Canadian Fishing Company, Vancouver, B.C., by the Fisheries Branch of the Department of Naval Service, for examination; and the undergiven are a few of the features of the specimen:

The colour is black on the top of the back blending into bluish over which are a series of blackish streaks, which extend little below the lateral line, leaving the sides and all the under part of the fish silvery—the first dorsal fin is about as high as long, and has seven spines preceded by two isolated spines (although the species is described as possessing in all a first dorsal with nine spines)—the second dorsal fin is composed of rays, apparently preceded by a spine, but the character of this fin has become obscured, and the fin is followed by some five finlets—the anal fin is preceded by an isolated very small spine and composed of rays, apparently preceded by a spine, but as in the second dorsal the character in the specimen is obscured; and the anal fin is followed, as in the case of the second dorsal, with some five finlets—the maxillary bone reaches to the front of the pupil of the eye; the jaws are beset with very minute teeth. The specimen is a male, fourteen inches in length.

The following is the geographical distribution of the Chub Mackerel (which has a much wider range

than the Common Mackerel of the Atlantic) as given in my *Check List of the Fishes of Canada*:

Widely distributed in the Atlantic and Pacific oceans; extending as far northward as British Columbia, Labrador, and England; abounds off the coast of California, in the Mediterranean, and everywhere in Japan.

ANDREW HALKETT.

CHERT USED BY THE INDIANS AS MATERIAL FOR ARROW HEADS, ETC., FOUND IN THE OTTAWA VALLEY.—In Mr. Keele's article on "The Location of Towns and Villages in the Ottawa Valley", in the October number of this journal (p. 69), he says the "flint" used for the manufacture of arrow points, etc., found in the Ottawa valley, probably "came either from Welland county on Lake Erie or from Flint Ridge, Ohio." Chert, commonly called flint, of which most of the arrow heads, spear heads and other chipped artifacts were made by the Indians in Ontario, is known to occur in the local Black river, and Chazy formations, and it seems reasonable to suppose that the Indians would use local supplies instead of bringing chert from such a distance. Until a few months ago, however, the only known place in the Ottawa valley, where chert had probably been quarried by the Indians, was at the Narrow locks, dividing the upper and lower Rideau lakes. Here Dr. Beeman, of Perth, found "what was evidently an open-air workshop, as the shore for yards was covered with flint chippings," and the chert "could be obtained on an island but a short distance from this point."* Last fall I found a handful of scattered chert chippings imbedded in the footpath along the north bank of the Rideau river, west of the Canadian Pacific railway bridge (Prescott division). I also saw a large nodule and some seams of chert, of the same colour as the chippings, *in situ* in the outcrop of limestone at the head of the rapids on the opposite bank. I picked up a few chips of the same material on the south bank east of the bridge. Now, the presence of these chippings and the chert *in situ*, so close together, leads me to believe that the material found here was quarried by the Indians, but, the operations were probably by no means as extensive as those at the well-known quarry near Point Abino, in Welland county, Ontario.

W. J. WINTEMBERG, OTTAWA.

*Beeman, Dr. T. W., "Lanark County," Annual Archaeological Report and Canadian Institute (Session 1891), Toronto, 1892, p. 15.

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