

CRIES OF REMONSTRANCE.

(1) Barking notes, uttered while flying over or around the intruder; the repetition several times in succession of a single syllable.

(2) A sort of purring growl which suggests the syllables: "ma-yow," or "keyow," sometimes drawn out to "ka-a-yow," with an impressive accent on the last syllable. It is uttered either from the air or from the ground. These cries have a rather ferocious sound.

(3) A prolonged, very high-pitched squealing cry (a sham cry of distress), uttered while on the ground, either standing or floundering in simulation of injury and helplessness.

The young of the Short-eared Owl also are capable of vocal expression. The four Owlets previously mentioned (June 23) were in various stages of development, the oldest being quite large and covered with thick wooly down, while the youngest, with its eyes not fully opened, was apparently not many days out of the shell. The older brothers were silent but the "baby" of the family uttered a little cry which sounded remarkably like the distant "peenk" of a Nighthawk.

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A STUDY OF THE HOME LIFE OF THE NORTHERN
PARULA AND OTHER WARBLERS AT HATLEY,
STANSTEAD COUNTY, QUEBEC, 1921-1922.

BY HENRY MOUSLEY.

Plates XIX-XX.

IN the opening pages of his monograph on 'The Warblers of North America,' Dr. Chapman points out that they have been described as "our most beautiful, most abundant, and least known birds." The above work was published in 1907, and so far as I know the description holds good today, for I believe it would be difficult at the present moment to find a really intimate study of the home life of any Warbler. This is not to be wondered at, for

the simple reason that few persons are inclined to spend the time and undergo the discomforts and disappointments attendant thereon. It would not be so bad or discouraging, if a single study of any one species could be "the be-all and the end-all" of the matter, instead of perhaps at least half a dozen, i.e. if one wishes to gain an adequate idea of the average home life of each species. No one, except those who have engaged in the work, knows what a strain it is on the nerves to sit for hours at a time, day after day, watching and recording the minutest happenings at a nest. There is no half and half business about it, for any laxity on the part of the observer, may result in some important detail being missed, and so one must be prepared to endure excessive heat, and the tormenting of mosquitos and black flies, whilst never taking one's eyes off the nest for a moment. Even after this, one may only be partially rewarded, as something unforeseen may happen to the young before the final study is complete, which is more than likely. No two pairs of birds act exactly alike, and therefore it requires several studies before one can form an accurate idea of their behaviour. In some cases, it is the male that shows the greatest boldness when humans intrude, in others, it is the female, and yet again, both may be equally bold or nervous. In the first case of the Black-throated Blue Warbler (*Dendroica caerulescens caerulescens*), as I shall presently show, the male took no part whatever in feeding the young, and had no further study been made, it might have been taken for granted that this was always the case. The present studies were begun in 1921, and from the first it became evident, if true pictures were to be obtained, there must be as little interference with the young as possible. Any approach to these, or the nest, usually resulted in the upsetting of the normal behaviour of the parents, and for this reason, it was thought best to do very little with regard to describing any changes in the nestling plumage. In some cases, it was difficult enough even with the greatest care, to overcome the natural nervousness of one or other parent, and induce them to keep on feeding their young normally. No one knows better than the author that the results, in some cases, were not always quite what they might have been, had no one been present. With the foregoing remarks, I shall now proceed with the more detailed account

of the five Warblers embraced in this paper, which, in addition to the Northern Parula Warbler (*Compsothlypis americana usneæ*), consist of the following, viz.: Black-throated Blue Warbler (*Dendroica cærulescens cærulescens*), Chestnut-sided Warbler (*Dendroica pensylvanica*), Magnolia Warbler (*Dendroica magnolia*), and Redstart (*Setophaga ruticilla*). It was on June 13, 1921, whilst en route to a favorite Warbler wood, that I heard the unmistakable notes of a male Northern Parula Warbler (*Compsothlypis americana usneæ*), proceeding from the top of a birch tree in the center of a small swampy wood. What more natural than the desire to once again test out my "Singing Tree," and Mr. Eliot Howard's "Headquarters" theory, and so it came to pass, that the song with its "explosive little buzz," eventually gave away the nesting site, and finally led to a tragedy. The nest was situated in the lowest branch of a very tall spruce (*Picea canadensis*), three feet six inches from the trunk, and twenty-six feet above the ground, and twenty yards away from the favorite (there were others) singing tree of the male, the birch. It was indeed a beautiful creation as will be seen from the accompanying photograph, and differed from any of those previously found here, being suspended after the manner of a Baltimore Oriole's (*Icterus galbula*), and I should imagine very, if not exactly, like the one described by the late Wm. Brewster in his 'Birds of the Cambridge Region,' 1906, pp. 328-329. It was composed entirely of usnea lichen (*Usnea longissima*), the only foreign material being a few cherry stalks, which may have been intended for a lining, but as a matter of fact, were all at one side, and upright, and seemed better adapted for strengthening, rather than lining the nest. The dimensions were as follows, viz.: outside diameter 3, inside $1\frac{1}{2}$ inches; outside depth $2\frac{1}{4}$, inside $1\frac{1}{2}$ inches. It was discovered about three o'clock in the afternoon, by scanning all the likely looking trees within the magic circle (i.e. 20 yards from the birch tree), see "The Singing Tree," 'Auk,' Vol. XXXVI, 1919, No. 3, p. 341, but it was not until four o'clock that the male was seen chasing the female. Soon after, a thunderstorm came on, and I was obliged to leave the site before ascertaining what was in the nest. This I found out the following afternoon, for just as I arrived at three o'clock, I saw the male go to the nest with a green larva in his mouth and feed the

young, and a minute later, the female went on the nest and remained brooding. I feel sure the young hatched out in the morning, for on the previous day (June 13), I had not seen anything of the female whilst looking for the nest in the morning, nor did the male ever approach the exact site of the tall spruce, which by the way was five yards from a logging road. After ascertaining that there were young in the nest, I went in search of other matters that were claiming my attention, and did not return until 5:15 p.m., when I took up a post of observation twelve feet away from the nesting tree. This meant that I was looking up, at an angle of about 70°, at the nest 29 feet above me. As can be imagined, this was a most trying position, but it could not be avoided, as the location and construction of the nest, as well as the denseness of the surrounding vegetation, made it absolutely necessary that I should be as near it as possible, if I wished to see all that was going on. Even then, some points were not always clear to me, as I shall mention later on. It would become tedious and take up too much space, if I was to relate in detail everything that took place at the various nests, so I have prepared a table giving a summary of the principal events. There are, however, certain points in each case, which seem to call for special mention, and these I shall deal with as they present themselves. Referring to the Northern Parula Warbler (*Compsothlypis americana usneæ*), as already mentioned above, the first period of watching commenced at 5:15 p.m. on June 14, and lasted for an hour only, as it commenced to rain. During that period, whenever the male arrived with food, which always consisted of soft green larvæ, the female invariably left the nest, with the exception of once, when he gave her the food, which she doubtless passed on to the young, but I could not be sure of this, as she was scarcely visible while brooding. On the following day, a very pretty incident took place. The female had left the nest at five minutes to nine, and at nine o'clock the male arrived with food. This he was distributing amongst the young, when the female suddenly appeared, and perched on a twig close beside him, but brought no food. Thereupon, he fed her also, and when he left, she went on the nest and brooded, always sitting with her head facing in one particular direction. This same incident in every detail was repeated at 10:55 a.m.

At 9:57 and again at 10:42 a.m. (also at 1:06 p.m. on the 16th, and 6:01 a.m. on the 17th) the male after feeding the young, sang in the nesting tree! This is a most unusual proceeding, in fact I have never seen it enacted before or since, in any species of Warbler. The males in my experience (I am only referring to Warblers of course), never give the nesting site away, by singing directly from the tree in which the nest is placed. Certainly, on two occasions, I have seen bereaved males (in one case it happened to be a Northern Parula Warbler, and in the other a Chestnut-sided Warbler), after singing for a day or two from their favorite tree, at last fly through the nesting tree, in a last endeavor as it were to find out the reason for the non-appearance of their mates, both of which had come to an untimely end by some manner of means. As a fitting climax to this most interesting period of watching, the male arrived at 12:10 p.m. with food, upon which as usual the female at once left the nest. After feeding the young, he proceeded to brood them, and continued doing so until 12:14, when the female returned, and took his place. This again is a most unusual thing for the males to do in my experience. Of the ninety-five hours of intensive watching of the five species embraced in this paper, I never once saw the act repeated. Of course I am aware the fact is not unique, as the male of the Chestnut-sided Warbler has been known to brood the young, but he did not do so in my case. This only shows how necessary it is (as I have already remarked), that we should have several intensive studies of each species, to enable us to form, at least, a better conception of the behavior of this sex, as regards incubating, feeding, and brooding the young, matters concerning which that of the female is pretty well known. During the afternoon session of this same day, i.e. June 15, nothing particular occurred, except that at 4:18 both parents arrived at the nest together, and this same thing happened again at 5:47 a.m. and 7:02 p.m. on the seventeenth. In cases of this kind, where circumstances allow of it, the parents stand side by side on the edge of the nest, and feed the young together. Here this was impossible, owing to the construction of the nest, so in each case the male fed first. But why should the male have fed the young first on each occasion, instead of the female? Simply because I imagine, her instinctive behavior of

brooding, bred in through the ages (which is a very different thing to the human reasoning powers which some people are so fond of ascribing to birds), told her (if I may use such a word in this connection, perhaps directed her would be better) to remain until last, so that she might brood her young after the male had left, which she did on each occasion. On the seventeenth, I spent nearly six hours with these birds, three in the early morning and two and three quarters late in the evening, and this was my undoing, for I began to realize that intensely interested as I was, it would be impossible to last out the strain much longer, of watching the nest in its present position, and something would have to be done to relieve the situation. However, before relating the tragedy these ruminations eventually brought about, I will record a few points of interest that were forcibly brought home to me, not only during these early and late hours of watching, on the above day, but also at other times as well.

In the first place, it was noticed that the food the male brought consisted almost invariably of soft green larvæ, whereas, that of the female more often than not consisted of insects, and the portions she brought were usually smaller in proportion than those of her partner. The latter, as a rule, never announced his approach to the nest by a sound of any kind, whereas the female always did so, by uttering a sharp "chip," which no doubt warned the young of her coming. The male, however, on several occasions when his mouth was full of food (this fact I know is almost unbelievable to some persons), gave vent to a short song, no doubt intended as a warning to his mate of his approach, for I noticed she became on the alert immediately she heard it, and was always ready to leave the nest. So far as I was able to judge, the male never removed the excreta or faeces voided by the young. As regards the female's behaviour in this matter, I am not positive as it was impossible to see exactly what took place in the nest, when she was in it, for, as I have already remarked, she was hardly visible. I have six or more entries in my note book, however, indicating that she was engaged in actions which I knew from experience, were those of a bird engaged in cleaning operations, but on none of these, or at any other time, was she seen to leave the nest with the faeces in her mouth. They were undoubtedly eaten, which is generally

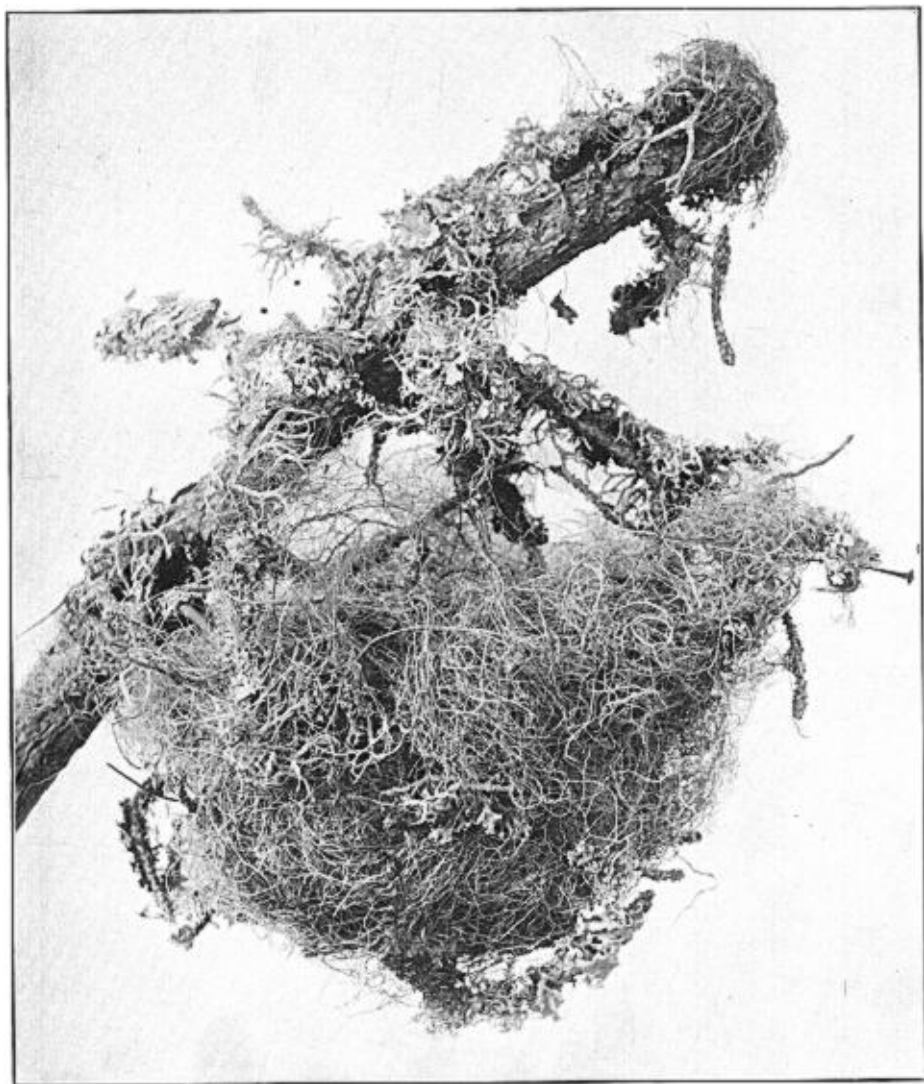


Photo. Geol. Survey, Ottawa

NEST OF NORTHERN PARULA WARBLER (*Compothlypis americana usneæ*),
HATLEY, QUEBEC, JUNE 13, 1921.

the case during the early stages of brooding, especially by the female. This habit of removing the fæces I feel sure is an instinctive or congenital one, bred in through the aeons of ages, whilst that of eating them, especially in the case of the female, is acquired, and brought about no doubt by the pangs of hunger whilst brooding. In the case of the male, it may be a question of hunger at the moment, or more likely a saving of labor in transporting the fæces some distance from the nest. It is a fallacy to imagine that the parents, after feeding the young, always wait and look for the fæces to be voided, although they usually do so, and even in some cases administer a sharp tap to the anus of the young when it fails to respond, this generally having the desired effect. Unquestionably to my mind this further procedure is congenital and not acquired.

On the sixteenth, although the sun shone brilliantly, there was a cool wind, and the male sang very little, but on the other dates he did so constantly, from certain favorite trees (as well as from the nesting tree itself as already recorded) in the neighborhood of the nest, and on the last day, i.e. the 17th, I heard him as late at 6:50 in the evening. This singing of the males of the American Warblers after the securing of a mate, and during the incubating, brooding, and feeding periods, is an interesting and important point. In my experience, they sing almost as loudly and constantly, after, as before, the securing of a mate, but Mr. Eliot Howard in his 'British Warblers,' 1907-1914, speaks in many places of there being a great falling off in the vocal performances of the males, not only after they have secured a partner, but also during the incubation and brooding periods. Of the twenty-six species included in his work, all with the exception of the Dartford Warbler (*Melizophilus undatus dartfordiensis*) are migratory, eleven only remaining to breed, with which eleven it has been my good fortune to be somewhat intimately acquainted, having found the nests and eggs of most of them. Of the Dartford Warbler, Mr. Howard was at that time unable to say anything definite, but of the other eleven species, with the exception of the Chiff-chaff (*Phylloscopus collybita*), which sings almost continuously even after the young have left the nest, we find constant references to the diminution or cessation of the song altogether, during the periods above mentioned.

Contrast this with my account of the singing of the male Blackburnian Warbler (*Dendroica fusca*), during the building of the nest by the female, or that of the Bay-breasted Warbler (*Dendroica castanea*), during the incubating by the female, see "The Singing Tree," ('Auk,' Vol. XXXVI, 1919, pp. 339-348), or yet again, that of the Nashville Warbler (*Vermivora rubricapilla rubricapilla*), during the construction of the nest and afterwards, ('The Auk,' Vol. XXXV, 1918, p. 302), and many other references to this same subject, too numerous to mention here. Of course there are exceptions to every rule, but it certainly looks from the general weight of evidence gathered by Mr. Howard and myself, and doubtless by others as well, as if there was a marked difference in the singing proclivities of the males of the Old World Warblers (Family Sylviidæ), and those of the American or Wood Warblers (Family Mniotiltidæ). And now for the tragedy of the nineteenth, brought about by the desire of a friend to photograph the nest and young, and my growing anxiety to have the same at a more comfortable angle for observation. We therefore decided to saw off the whole branch, and lower it and the nest, to within about six feet of the ground. Now, my friend knows that, although agreeing to the arrangement, I expressed my doubts at the time as to its ultimate success. Accustomed as I have been all my life to experiment with birds, and in most cases with success, an example of which I shall give later on, I have always selected what I considered the exact psychological moment for the experiment, i.e. when everything was attuned to what one might call concert pitch. In the present instance, it seemed to me that these conditions were decidedly wanting. To begin with, I was quite ignorant of the possible strength of the parental instinct in this species under abnormal conditions. The young (of which there were three) were only five days old, and had barely begun to make their voices heard, and for this very reason, if no other, it seemed inadvisable to make the change at this stage of their existence. Had they been older, their clamoring for food, combined with the fact that the parental instinct, incident to this particular term of the reproductive cycle, would have been reaching its maximum, and I feel sure the parents would never have deserted their young as they did. Needless to say I was greatly grieved and disappointed,

but the best of us commit errors at times. From errors we learn wisdom, and this failure I hope will cause those who pin their faith on the human reasoning of birds, to study more fully the subject. There was no earthly reason why the parents should have deserted their young. The branch with the nest and young was always in full view of them, and had they remained in the neighboring trees, and used their supposed reasoning powers, they would have returned to the nest directly we had retired out of sight. But this was not so, and although I visited the spot several times again that day, it was all in vain, they never returned. A link in the chain of the reproductive cycle had been broken, and at a point where it could not be repaired. A new nest must be constructed, a fresh set of eggs laid, another incubation period undertaken, and then once again, a brood of young would appear, if nothing unforeseen occurred. And so it is always, unless the break or alteration in the normal conditions of any particular cycle, occurs at a time when it can be bridged over. This can only be, when nature is attuned to withstand any temporary disruption of its natural functioning, which it evidently was not in the present case. The parental instinct had not had sufficient time to get worked up to that pitch, (and the young were not old enough to play their part, by vociferous clamoring for food, which all helps in the natural order of things, to the attainment of the above state), when little short of an earthquake, so to speak, would have prevented the parents from sticking to their young, in spite of the altered condition of things. Nervous temperament of course plays its part, all birds not being alike in this respect, but the love of the young, especially by the mother, usually overcomes any sense of fear evoked by alterations in the original site or surroundings of the home. The young at this date had a line of darkish feathers just showing down the center of the back, rest of back and sides bare, also center of belly and underparts, except for a strip of whitish or yellowish feathers on either side, extending from the throat to the rump. Head covered with darkish down, eyes open but not fully so. Pin feathers of wings and tail just showing.

The next nest to come under my observation was that of a Black-throated Blue Warbler (*Dendroica caerulescens caerulescens*), which I discovered on June 20, 1921, in a patch of American

yew (*Taxus canadensis*), a very favorite nesting site for this species. I was passing this patch when I noticed the female hovering about with food in her mouth, so I sat down on an adjacent stump and awaited results. It took some little time before she at last ventured to approach and feed the young, and no wonder, for I was sitting only sixteen feet away from the nest, which was resting on a drooping yew branch, and was only ten inches above the ground, and contained four nearly fledged young. It was late in the afternoon when the discovery was made, so I decided to postpone the first period of watching until the following day. Arriving at 5:30 in the morning, I heard the male singing not far off, and seven minutes later the female arrived and fed the young with a soft green larva and insects. Twelve minutes later, she again fed them with the male in attendance, and this occasion, and two others, on one of which he brought food, but did not feed the young, are the only ones on which the male approached the nest during this first period of five hours' watching. I often heard him singing in the distance, however, very softly and lazily, and once he drove off a male Chestnut-sided Warbler which alighted in a tree near the nest. The female on the contrary was very busy, feeding the young no less than 123 times, usually with insects, but also at times with soft green larvæ. Once she fed a daddy-long-legs (*Tipula oleracea*), and it was a most amusing sight to see the maneuvering that had to be gone through, to get the long legs packed away into the throat of the young one. Quite good sized moths were also occasionally brought. She removed the fæces ten times, always carrying them away in her bill to a nearby tree, and dropping them often cleaning her bill by rubbing it backwards and forwards on the branch. So tame did she become, that I had her collecting food all around me, and on several occasions I could have touched her by either extending my leg, or stretching out my arm. During thesecond period of watching in theafternoon, the male twice accompanied his partner to the nest, but brought no food. Once again he, however, chased off the male Chestnut-sided Warbler, and sang constantly both near, and at some distance from, the nest. The female behaved as in the morning, feeding the young 56 times, or at the rate of about once every two minutes! They were now chippingper lustily, and the female also kept up a

constant chipping, whilst searching for food, and when approaching the nest. At the third sitting in the evening, events at the nest went on much as before, the male singing for the last time, just before nine o'clock, as the female was feeding the young, also for the last time. The following day, June 22, was the last I was to spend with this pair of birds, but the five and one-half hours that I was at the nest will never be forgotten. Now it is the usual practice of Warblers, and for most birds I think, to approach and leave their nests almost always by some well defined route, i. e. on arrival they usually land on some particular branch of a tree or shrub, and from there perhaps pass to another nearer the nest, and then to the nest itself, never in the first instance flying direct to the nest. On leaving, however, they usually fly off in one particular direction, the female sometimes in a different one to that of the male. Having learnt by now the almost invariable procedure of this particular female on leaving her nest, I decided to fasten a small piece of crumpled up white paper to a little twig directly in her line of exit, and see what she would do. The first time, she tried to remove it, but failing in this, she flew off. The next time she perched close to it, but did not try to remove it, and for the future took no further notice of it. Evidently, in the first instance, she mistook this small ball of paper for a while faecal sac, which her instinctive behavior would lead her to remove. The young were now moving about in the nest and chipping loudly every time they saw the female arriving with food, and I began to realize that it would not be long before they would leave their home for good.

At one o'clock, the male arrived with food in his mouth, and a minute later, went to the nest at the same moment as the female did. Thereupon, some kind of scuffling took place, and in the mêlée I was unable to make out exactly whether the male fed the young or not. At all events, he went off with his partner, and as he had no food in his mouth, I am giving him the credit of having fed his offspring, for the first and only time. Five minutes later, he returned with his mate, and waited whilst she fed the young, and then went off with her again. A minute later, the same thing was repeated, except that the male on this occasion indulged in a little singing. The heat was very oppressive by now (84°), and

the young were beginning to feel it, and at twenty minutes past two, the first one left the nest, and flew into a small fir tree two yards away. Soon after, the female arrived and fed it, and did so again, four minutes later. Then she turned her attention to the three remaining young in the nest, and fed them five times in succession, before she again attended to the one in the fir. At seventeen minutes past three, two more young left the nest, and thirty-six minutes later, the last one also took his or her departure, being just a little over one hour and a half after the first one. During all this time, the male never put in an appearance excepting once, when he chased a male Black and White Warbler (*Mniotilta varia*) away. When at last he did appear, the young were scattered about all over the place, one of them being 28 yards away from the nest. His astonishment seemed great, as he flitted from tree to tree, but he did nothing whatever towards helping his mate feed and keep the young together. By staying longer, I felt I was only making matters worse for this hard-working little mother, as by moving about trying to keep track of the young, I only frightened them still further away, so at four o'clock I decided to withdraw. During this last period of five and one-half hours watching, the female had fed the young 138 times, to her partner's once, or a total of 349 times, for the whole period of fourteen hours, or once every 2.4 minutes! She has been described by a newspaper reporter, as "the busiest mother in the world!" and not without good reason I think. As I departed, the thought uppermost in my mind, was that I had witnessed the case of a young male mated to an older, and more experienced female, and this was strengthened by the subsequent behavior of the male, in the following case which next came under my notice.

The nest in this instance was the third one in succession from the same pair of birds, and was in the same wood as the one just described. The first nest I discovered on May 27, 1921, built in the forks of a small fly honeysuckle bush (*Lonicera canadensis*), one foot above the ground. When found, it was quite finished, but the first egg (which I never saw), must have been taken by a squirrel, I think, as the birds deserted it. They then moved 75 yards away, and constructed another on the drooping branch of a balsam fir (*Abies balsamea*), ten inches above the ground, and two

feet eight inches from the trunk, and which contained four eggs when I found it on June 9. These I took, as I was anxious to obtain some further data relative to my paper on "Subsequent Nestings," (*'Auk,'* Vol. XXXIV, 1917, pp. 381-393). The birds then started their third venture (which I promised them not to molest) forty-four yards from the present site, the nest being placed in the forks of a small fly honeysuckle bush (the same as the first one was), eighteen inches above the ground. Three eggs were laid, and on July 5 two young hatched out, the third egg proving later on to be addled. On approaching the nest, the female dropped to the ground, and acted the well known broken-wing trick (inherited), trailing it along the ground in an endeavor to divert my attention to her, and lead me away from the nest. I selected the most convenient place for observation, and sat down twenty feet from the nest. I remained only a quarter of an hour, but returned again at 3:30 p.m. and stayed until 5:30. During these two hours, the male put in very little time at the nest, and never once attempted to feed the young, although the female did so nine times. I heard him singing, however, on several occasions, but generally at some distance from the nest. On the following day, he broke my existing records, by feeding the young three times to his partner's twelve. This, however, seemed to be too much for him, as on the following day he had a serious relapse, and never fed his offspring once, whereas his partner did fifteen times, and brooded almost as many. The heat was terrific, the thermometer at 1 p.m. registering 92°, with a great deal of humidity, which increased one's discomfort, to say nothing of mosquito bites. The female was visibly affected, often standing up in the nest, with her mouth wide open, panting for breath, whilst with outspread wings, she shielded the young from the sun's rays. The male, although not troubling himself in the least with home affairs, did the usual amount of singing, both near to, and at some distance from, the nest. The following day (the 8th) the heat was as great as ever, but a change had come over the male, for he fed the young nine times to his partner's seven. On the 9th, his average was in excess of that of the female. On one occasion, they both arrived at the nest together, and it was a pretty sight to see them perched side by side, each feeding a young one. It was during this same

period of watching that I was fortunate in witnessing two rather remarkable episodes. At a minute past two o'clock the female left the nest, and did not return until two forty-five, being absent forty-four minutes, during which time the male fed the young twice. Again, at three thirty, after feeding the young, the female went off with the male (he had been flitting about near the nest), and did not return until four fifty-eight, after an absence of one hour and twenty-eight minutes! During the whole of this time, the male did not feed the young at all. In view of the previous long absence of the female, I was doubly on my guard this time, and never, for a moment, took my eyes off the nest. Let any one try this, and they will soon realize the truth of my statement, regarding the strain on one's nerves that bird watching entails. On this date also, the male was seen for the first time to clean the nest by carrying away the fæces in his mouth, and the female did likewise. She had been seen to do this once previously, on the seventh. How many times she ate the fæces it is impossible to say, as one cannot be sure of this, when a bird has its head hidden in the nest, whilst rooting about, not only for the fæces, but also for any lice there may be as well, both of which I believe are invariably eaten by the female in the early stages of the home life when brooding is the order of the day. I was unable to visit them on the 10th, and when I arrived at 2 o'clock the following day, both young had gone, taken no doubt by some rascally squirrels that I had seen and frightened away on several occasions, during my previous periods of watching. I ought by rights to have shot them, as they are far too numerous, and on other occasions have been the means of spoiling no end of my studies, just at the time when some particular data were most needed, as in the present case, that of the age when the young leave the nest, which I was unable to fix definitely in the previous study.

The next nest to come under my notice, was that of a Chestnut-sided Warbler (*Dendroica pensylvanica*), and this has quite a little history attached to it. In the first place, the male of the pair to which it belonged, was the one the male Black-throated Blue Warbler chased away on two occasions on June 21, and he it was also, that flew through the nesting tree, in a last endeavor as it were to trace the whereabouts of his lost mate, both of which



Photo. Geol. Survey, Ottawa

NEST OF MAGNOLIA WARBLER (*Dendroica magnolia*), HATLEY, QUEBEC,
JUNE 16, 1922.

incidents I have already alluded to. Round this former nest (which was one of the very few in which fir twigs were used in the construction, and on which his partner had only worked for two days before coming to her untimely end), the male had sung for several days, before finally deserting it. At last he moved away, but I found him singing again in another tree, about eighty yards from the former site. A few days later he secured another mate, and I located their nest (the present one) on June 20, 1921, just seventeen yards from the new singing tree, and twenty-five yards from the nest of the first pair of Black-throated Blue Warblers found on this same date. It was situated in a raspberry cane, two feet eight inches above the ground, and when found was only partly constructed, the female being in it at the time. On June 25 it contained a set of four very beautiful heavily zoned eggs, and incubation had just commenced. The first young hatched out sometime between 10 a.m. and 6 p.m. on July 5, and at 9 a.m. the next morning there was another, the third appearing later on in the day, the fourth egg was added. I took up a station twenty-two feet from the nest, and commenced my first period of watching at 8:50 on the morning of July 6. Nothing particular took place, the female as is usual in the early stages doing a good deal of brooding, nearly always sitting in the nest facing in one particular direction, the same as the Parula and Black-throated Blue Warbler did, whilst the male sang in nearby trees, and did most of the feeding. The young were naked and blind, except for a little down on the tops of their heads, which was also the case with the young of the last mentioned pair of Black-throated Blue Warblers when they hatched out. The following afternoon the heat was very great (80°), and both parents seemed to be affected by it, the female at times brooding the young, by standing over them with outspread wings, and mouth wide open. On one occasion, the male drove off a male Black-throated Blue Warbler which had approached the nest too closely, and again later on, did the same thing to a female of the same species, no doubt the parents of the brood which left their nest on June 22, which nest it will be remembered, had only been twenty-five yards away. And so it came about, that the Black-throated Blue Warbler had the same cold reception meted out to him, as he had extended to the Chestnut-sided Warbler,

when the latter visited his preserves on June 21. Nothing of particular interest occurred on the 8th, and on the 9th, I was unable to visit them. The following day, soon after I arrived, or at 10:25 a.m. to be precise, the male and female appeared at the nest together, the former with food only. Part of this he fed to the young, and the rest he gave to his partner, who ate it, and then brooded the young. Twenty minutes later, the male, after feeding the young, removed the fæces for the first time, carrying them away in his mouth, and dropping them from the branch of a nearby tree. It had become noticeable by now, that he always left the nest differently to the female, flying in my direction, whereas she went off sideways. They both, however, approached it in the same way, from below. At 11:40, both parents again arrived at the nest together, and this time they both brought food, which they distributed to the young, they themselves standing side by side on the edge of the nest. The male fed a very large soft green larva, and his partner a large moth, both of which morsels caused the young many contortions, before they could get rid of them. From this date the male did the bulk of the feeding, and carried away the fæces thirteen times; the female once. She had been assiduous up to then in this, as well as in ridding the nest of pests, all of which, however, had apparently been eaten, as seems to be the universal custom. On the 11th, the eyes of the first two young were about half open, that of the third about a quarter so. The food on this day seemed to consist of very large soft green larvæ, which at times it seemed almost impossible the young could swallow, in fact, on some occasions when difficulty arose, they were withdrawn by the parents, and re-arranged. On the 12th, I was unable to visit them, but on the following day, the eyes of the first two were wide open, and those of the third about three quarters so, the feathering and wing bars being well advanced. At 10:17 a.m., the male chased away a male Canada Warbler (*Wilsonia canadensis*), and at 11:40 the young began to be very lively, continually preening their feathers, and moving about in the nest. In the afternoon it became very hot, and the young suffered in consequence, continually opening their mouths and panting for breath. Once in the morning, the male dropped the fæces half-way between the nest and my seat, but although so near me (only

eleven feet off), he returned and picked them up off the ground, and flew away with them, a good instance of the strength of this instinctive habit. I was obliged to leave the site at 3:30 p.m. which was unfortunate, as I felt sure it would not be long before the young would leave the nest, as they were getting extremely restless, accentuated no doubt by the great heat. When I arrived the next morning at ten o'clock, they had all gone having left the nest either early that morning, or late the previous afternoon when they would be eight days old.

By this time, what with all my other activities in the orchid, fern, and butterfly line, I had had about enough of bird watching, and had almost decided to give it up for good. Resolutions of this kind are very easy to formulate, but precious hard to keep, and the capture of a new butterfly, or the finding of some rare fern or orchid, is apt to bring on an attack of the old fever at any moment, and so it was, that a year later, or on June 19, 1922, the finding of a nest of the Magnolia Warbler (*Dendroica magnolia*) which seemed to offer fresh "possibilities," set me off on the war-path once more. The nest in question was situated in a small fir tree, four feet above the ground, and close to the trunk and at the time contained four young birds, which I took to be seven days old. Their eyes were fully open, and the nestling plumage well advanced. From the very commencement, I saw a new field of experience would be opened up, owing to the shyness of the female. Hitherto, all the birds had exhibited very little fear at my presence so near their nests, and what they had, they soon mastered, owing to my knowing how to keep perfectly still, one of the most important things in bird watching, and one to which the novice hardly ever pays any attention. In the present case, I found the nest at noon, but did not commence the first period of watching until 1:30 p.m., sitting twenty-four feet away from the nest, but in full view of it, as all obstructions had been cleared away, the same as had been done in the previous cases. The female was very nervous, but the male was just the opposite, taking no notice of me whatever, and as in the case of the male Chestnut-sided Warbler, always flying in my direction when leaving the nest. He fed the young eleven times to his partner's four, and removed the fæces seven times to her once, always carrying them away in his mouth, and dropping

them from the bough of a tree. It was very close and muggy, and the male did not sing at all, but he made up for this the following day (the 20th) by singing constantly from nearby trees, both in the morning and afternoon. He removed the faeces eight times, dropping the little white sac on one occasion near the nest, but like the Chestnut-sided Warbler, he at once returned, and picked it up off the ground, and carried it away. Twice he sang with food in his mouth, the same as the Northern Parula Warbler did. After my arrival at 9 a.m., it was three quarters of an hour before the female summoned up courage enough to feed the young, although the male had already done so five times. Once they arrived together, both bringing food, which they gave to the young in turn, they themselves standing side by side on the edge of the nest. In the afternoon, the nervousness of the female increased if anything, and on three occasions she actually remained underneath the nest, with the food in her mouth, once for thirty-seven minutes, and it was only on the arrival of the male, that she ventured up with him and fed the young, both standing together on the edge of the nest as before. They both approached it from below, the same as the Chestnut-sided Warblers did, and like them, also, left it in different directions, the male flying directly towards me as already mentioned, and the female going off sideways. I was unable to visit them on the 21st, and when I arrived the following afternoon, the young were all gone, having left the nest either in the morning or on the previous day, when they would be eight days old, as this was the age of those in the following case when they left their nest. This was a very interesting study, for the nest, as will be seen in the photograph, was somewhat unique (although I had found a similar one a few days before), being built in the forks of a spiræa bush (*Spiræa salicifolia*). I suppose I must have found some dozens of nests of this species, but never in anything but coniferous trees, this being the usual site, not only here, but elsewhere. However, there is a reference curiously enough to a nest having been found by the Rev. C. J. Young, on July 1, 1895, built in a spiræa bush among small pines and hemlocks, near Otly Lake, Lanark Co., Ontario, see 'Catalogue of Canadian Birds,' Macoun, 1909, p. 637.

The present one was found on June 16, two feet six inches above

the ground, and contained four heavily incubated eggs, three of which hatched out four days later, two at 11:30 a.m., and the third a few hours afterwards, the fourth one being added. Previous to this, I had made up my mind to collect this nest, as it was an unusual one, and substitute another in its place, but to have done so when the female was incubating would no doubt have lost me the opportunity of recording the home life of this pair of birds, as she would most probably have deserted it. I therefore provided myself with an old nest of the species, and waited until this particular period of the reproductive cycle had reached its maximum, i.e. immediately the young were born, and the fulfilment of the instinctive habit of incubating had been attained. This occurred as I have already mentioned on June 20, at 11:30 a.m., about which time, whilst the female was away seeking food, I quickly cut off the branch with the forks containing the nest and placed the old one in some adjacent forks of the same bush, but somewhat lower down, and to one side, and took up my seat of observation twenty-four feet away, the same distance as in the previous study. In less than five minutes, the female returned, and both fed and brooded her young, just as if nothing had happened. This was the other experiment I referred to, when dealing with the case of the Northern Parula Warbler, and it worked out all right, because it had been carried out just at the right psychological moment. After this experiment I thought it best to keep away for a time, so did not return until the following morning at 8:30. During this period of watching, the male did not feed the young at all, but he sang constantly from nearby trees until about ten o'clock, when it commenced to rain, with indications of a thunderstorm coming on. I was glad of this, for the weather was very oppressive, and I had made up my mind to stay through it all, and see how the female would behave during the heavy rain, which was beginning to come down in torrents. The young at this time were of course blind, and nearly naked, with the exception of a little down on the tops of their heads, wings, and along the center of their backs, and those believing in the human instinct and reasoning power of birds, would naturally conclude that the female would brood and never leave them for an instant, for fear of their getting soaked with the rain. Nothing of the kind, for what did she know of

thunderstorms, or any other unforeseen circumstances, her instinctive behavior of feeding her young at certain intervals alone guiding and directing her, so that she left the nest several times during the very height of the storm, when the rain was literally coming down in the proverbial buckets full, and I was drenched to the skin, notwithstanding that I had on a light mackintosh. At eleven o'clock the storm was beginning to abate, so I made for home, leaving the female on the nest brooding her young.

On the following day, neither parent displayed the least signs of fear, going about their business as though I had not been there. The male sang a good deal, and twice ate the fæces, which is as a rule unusual for this sex. The female did likewise, on three occasions at least, and spent a good deal of time cleaning both the inside and outside of the nest. Just before I left, at five o'clock, the male arrived with food, which he passed on to the female, which was brooding. She immediately arose off the nest, and fed the young, and then brooded them again, always sitting in the nest facing one way. On the 23rd, both birds again ate the fæces, and the male did the usual amount of singing. The eyes of the young were just appearing as tiny slits. On one occasion, the parents arrived at the nest at the same time, and standing side by side fed their young, and then placing their heads on one side, in the characteristic way, they looked and waited for the fæces to be voided. The male seized and ate them, and then departed, leaving the female to brood. The following day (June 24), this habit of eating the fæces was abandoned by both birds, as is usual in the later stages of the home life, when they are nearly always carried away by both parents. The eyes of the young were now about one-quarter open, and pin feathers were showing on the wings and down the center of the back. They were very drowsy at the time. The female again did a good deal of cleaning, both inside and outside of the nest. The male sang a little on two occasions only, although it was a beautiful afternoon. He made up for it, however, on the following day, as he sang constantly (on one occasion with food in his mouth) during the three and three-quarters of an hour I was at the nest. The sun shone brilliantly, which the young seemed to feel, as they kept twisting and moving their heads about, with mouths wide open. The female constantly stood over and

shielded them with outspread wings, whilst she preened her own feathers. The cleaning of the nest also took up a good deal of time, on one occasion this work lasting for ten minutes. At the back of the nest there was a wooden fence, and on one occasion a squirrel ran along it, and I am sure must have seen the nest, although he had no chance of investigation at the moment, as I frightened him off. The following day, the 26th, I was unable to visit the site, and when I arrived at 2 p.m. on the 27th, I saw a good many changes had taken place. The young had developed rapidly (they usually do during the last few days), and the female had given up brooding them. I was hardly surprised, however, to see only two of them in the nest, instead of three, for I had had misgivings concerning the squirrel seen on the 25th, which doubtless was the culprit. It was a very hot afternoon, and black flies were particularly troublesome, and no doubt owing to the former condition, the male did not sing at all. The following day was not much better, but the male was singing when I arrived at 1:45 p.m. The young had made wonderful strides since my last visit, but I was hardly prepared for what took place twenty-five minutes after my arrival, when one young bird made valiant efforts to leave the nest, and eventually did. Immediately afterwards, the male arrived and fed the remaining young in the nest, and removed the fæces. A minute later, the second young left the nest, and perched on a little twig at the side of it. The female arrived at this juncture, and fed young number one, which she espied on the ground as she approached the nest from below, the same as the male always did, this mode of approach apparently being characteristic when the nest is situated a few feet above the ground. Then for some unexplained reason, both parents persisted in flying all round me for a little time, but eventually went off. This was at 2:17 p.m., and three minutes later young number two essayed a descent to the ground, literally scrambling down the spiræa bush, as it was unable to fly. Thirteen minutes later, the female went to the nest, but finding no young in it, she ate the food she had brought, and removed some of the fæces. Two minutes afterwards, the male also arrived, and upon his finding no young in the nest, he also ate the food he had brought, and removed the last traces of the fæces. This was an interesting example of the

strength of this inborn habit of removing the fæces, notwithstanding the fact that there were no longer any young birds in the nest. It was also interesting to note that, although young number two was on the grass just in front of the nest, neither parent seemed to notice it. The habit performed so many times of going direct to the nest was dominant at the moment, and had to be gone through, but was broken directly after, when the parents found and enticed both young to a safer retreat, let us hope, in a little nut bush, where I left them in peace.

On the same day that I discovered the above nest, i.e. June 16, I also found one belonging to a pair of Redstarts (*Setophaga ruticilla*). This was situated in the forks of a maple sapling, three feet nine inches above the ground, and at this date contained four heavily incubated eggs. These hatched out the same day as those belonging to the above pair of Magnolia Warblers, i.e. June 20. I was unable to attend to them, however, until three days later, when I took up a position twenty-eight feet from the nest, and in full view of it. It was not long before I discovered that in this instance I had a highly nervous male to deal with, instead of a female, as was the case with the first pair of Magnolia Warblers. During the three and three-quarter hours I spent with them on this occasion, he only fed the young twice, to his partner's twenty times. He seemed literally unable to overcome his fear of my presence. Time and again he approached the nest with food, but was unable to summon up sufficient courage to feed his offspring, and eventually ate it himself, after flitting about with it in his mouth, for considerable periods at a time. This kind of thing went on until 11:30 a.m., when I decided to steal a march on him, by apparently leaving the spot, and then doubling back again, and hiding behind a large tree some little way off. Ten minutes after I left, he fed the young, and when he left the nest, I returned to my seat. He was back again in five minutes, but as soon as he saw me, the old fear returned, and he would not feed the young, but kept flitting about as before, with the food in his mouth. Four minutes later he made another attempt, but again his courage failed him, but at last, three minutes later, he fed his offspring for the first time in my presence, and removed the fæces by carrying them away and dropping them from an adjacent

tree, which seems the usual custom. He was certainly a home bird, for during this long spell of watching, he was hardly ever out of sight, and sang or chipped nearly the whole time. He had two favorite trees, one a beech, four yards from the nest, and the other a hemlock, ten yards away, in which latter he seemed to gather most of his food, which consisted of insects and not green larvæ. Once he drove off a male Red-eyed Vireo (*Vireosylva olivacea*), which encroached upon his preserves. The female was the very opposite of the male, taking not the slightest notice of my presence and going about her business as if no one was there. The young were blind and naked, with the exception of a little down on the tops of their heads, and on the wings, and along the back. In the afternoon, the male fed the young once in my presence, and I had hopes he was getting over his nervousness. The next day, however, this was not so very apparent, for he only fed the young twice, to his partner's seven times. His singing, nevertheless, was most persistent (once with food in his mouth), and he never went far from the nest. On the 25th, however, a great change had come over him, for he fed his offspring seven times to his partner's four, and seemed to have quite got rid of his fear of my presence. At 3:55 p.m., I examined the young, whose eyes were now about half open, with the feathers on wings, and down the back, developing nicely. I had hardly reached the nest, before the male arrived, and made a good deal of fuss, trailing his wings on the ground in an endeavor to draw me away. His singing again was persistent, especially from his favorite beech, and he was rarely out of sight. At five o'clock I was obliged to leave, as the mosquitos were simply unbearable, the nest being in a wood where these pests were especially numerous and venomous. It was not until the morning of the 28th, two days later, that I was able to pay these birds another visit. Arriving at ten o'clock, and seeing neither parent about, I thought I would have a look at the young. They had certainly made great progress since I last saw them, being now covered all over with feathers, and looked ready for leaving the nest, far more so, than the two young Magnolia Warblers, which were the same age as these Redstarts, and which also left their home in the afternoon of this same day. I had only retreated a few paces from the nest, when I heard a commotion, and on

looking round saw all the four young Redstarts flying to the ground. The time had arrived when my presence at the nest had aroused the innate or congenital instinct of fear in these young birds, and in consequence, they left it, no doubt somewhat earlier than they would have done had I not looked at and touched them. This only bears out the contention, already expressed, that if a true picture of the home life is desired, it is best to keep away from the young altogether. In returning to have a last look at them, I found the old birds on the scene, both of which went through the usual performance of trailing their wings on the ground, in an endeavor to divert my attention to themselves, and draw me away from the young, which were now getting scattered about in all directions, and so I left them. In summing up the results of these studies, in so far as they have gone, I think I am entitled to claim that they have brought out the following facts, viz.:

(1) That the males of the American Warblers (Mniotiltidæ), on the whole, sing more during the various periods of the reproductive cycle, than do the males of the Old World Warblers (Sylviidæ).

(2) That it is unusual for the males to sing in the nesting tree, or brood the young, this latter duty being almost entirely undertaken by the female.

(3) That the fæces as a general rule are removed by the males and not eaten, this latter habit being far more generally acquired by the females, no doubt to satisfy the pangs of hunger whilst brooding.

(4) That the usual custom, when removing the fæces, is to fly with them into a tree, and then drop them on the ground.

(5) That the males as a rule help to feed the young, and very often do most of this work.

(6) That the males are intolerant of other birds encroaching on their particular ground, and always drive them off.

(7) That the food more often than not consists of soft green larvæ, small insects and moths coming next, the males as a general rule bringing larger portions than the females.

(8) That the young may leave the nest on an average rather earlier than has generally been supposed.

(9) That in the early stages the female does far more brooding than feeding the young.

TABLE OF SUMMARIES ON SEVEN WARBLERS' NESTS

Species	Period of Observation	Hours	Number of times fed by		Average Rate of Feeding in Minutes once in	Number of times brooded by		Total time brooded Hours and Min.	Times Faeces eaten by		Times Faeces removed by		Age of Young at beginning of Observation
			Male	Female		Male	Female		Male	Female	Male	Female	
Northern Parula	June 14-19	15	45	21	13.6	1	34	11.27	0	?	0	?	Just hatched
Blk-throated Blue	July 5-11	15½	16	46	15.0	0	44	4.51	0	?	1	2	"
" "	June 21-22	14	1	349	2.4	0	0	0	0	0	0	32	7 to 8 days
Chestnut-sided	July 6-14	18¾	58	40	11.5	0	27	6.23	0	?	13	1	One day
Magnolia	June 19-22	7	31	20	8.2	0	0	0	0	0	15	5	About 6 days
"	June 21-28	15	34	58	9.8	0	36	6.19	5	4	8	9	One day
Redstart	June 21-28	10	12	32	13.6	0	32	5.04	1	5	3	3	"

(10) That both male and female, as a general rule, always approach and leave their nests by a certain well defined route, and the female, when brooding, usually sits in the nest facing in one particular direction.

(11) That either sex may, and does at times, exhibit extreme nervousness whilst being watched, which, however, parental instinct usually overcomes in the long run.

(12) That the young are fed on an average once every ten or eleven minutes.

(13) That in the early stages, when brooding is necessary, it lasts on an average for about twelve minutes at a time.

(14) That alterations to the nesting site are always accompanied with a certain amount of risk to the young, and should therefore never be attempted, except by the experienced student, who has a definite scientific object in view.

Hatley, Que., Canada.

THE PENNSYLVANIA GERMAN NAMES OF BIRDS.

BY HERBERT H. BECK.

IT IS doubtful if there exists in the United States a more distinctive or more picturesque set of local names of birds than those current in southeastern Pennsylvania among that people of German-Swiss antecedents traditionally and broadly called the Pennsylvania Dutch; in a more limited way, by standard usage, the Pennsylvania Germans.

The language of these people, which is a fusion of South German dialects with an infusion of English, for two hundred years has persistently refused to be absorbed from its racial eddy by the strong stream of American life. It maintains itself as the dominant language of many rural regions of Berks, Lebanon, Monroe, Lehigh, Northampton and Schuylkill Counties, and the northern parts of Lancaster, Montgomery and Bucks Counties. Even in the larger towns like Reading, Allentown and Bethlehem, it is still actively used. In its sound, inflection and flavor it is positive and dialecti-