THE OLIVE-BACKED THRUSH (*Hylocichla ustulata swainsoni*) AT HIS SUMMER HOME.

BY CORDELIA J. STANWOOD.

A more or less irregular line of woodland — evergreen, hardwood, mixed growth — stretches from Trenton, Maine, on Frenchmans Bay, opposite Bar Harbor, along the Union River, almost to the post office in the city of Ellsworth. When the Thrushes appear in the spring, they come from the direction of the river, through the cool, damp, mossy aisles of these woodlands. As the time draws near for the coming of the Thrushes, I take the overgrown footways that mark old woodroads, walk toward the river, and listen with bated breath for the first notes of the Thrushes — the Hermit, the Veery, the Olive-backed.[1]

The Hermit (*Hylocichla guttata pallasi*) the first to arrive, usually announces his presence by an early morning hymn. He comes about the middle of April, when the ground is still slightly frozen at sunrise, when a thin coat of ice silvers every pool, when a white frost glistens on each sere field, and the city of Ellsworth slumbers in a thick, white mist, from which the steeples and roofs just emerge. Sometimes he is overtaken, several days after his arrival, by one of those cruel sleet and hail storms that coats everything in ice, and makes life very hard for our tired, hungry migrant. The Hermit is with us about a month before our other two resident Thrushes, the Veery and the Olive-backed, appear. One year the Olive-backed calls before the Veery, the following year the order of their coming may be reversed. May 8 (1913), very early in the morning, I heard two or more Veeries in excellent voice. My earliest record for the call note of the Olive-backed Thrush is May 15 (1911).

Although at the time of the arrival of these latter birds, the foliage is beginning to appear on the trees, the catkins of some of the alders, willows, and birches are in full bloom,

[1] The Hermit Thrush at Home. By Cordelia J. Stanwood. Nature and Culture. May, 1913.

Nest of Olive-backed Thrush (*Hylocichla ustulata swainsoni*) in its environment.

and the hobble bush, wild pear, and arbutus cast upon the gentle breezes, the delicate, sweet odors that go to make up the bewitching, elusive essence of a spring day, even yet the ground is sometimes frozen in the morning, and there are occasional flurries of hail and snow, and heavy white frosts.

The Veery (*Hylocichla fuscescens fuscescens*) is but locally common, choosing the swales and adjoining thickets for his habitat, but wherever there is an estate with wooded grounds, or a farm with pastures and woodlands, here the Olive-backed Thrush and the Hermit erect their dwelling-places.

SUMMARY OF FACTS.

1908—June 8, a nest completed; June 8, bird lining nest; June 9, bird incubating; June 19, nest completed; July 2, nest containing young ready to leave; July 3, bird incubating; July 8, nest containing young one day old; September 6, Olive-backed eating string cherries.

1909—May 31, Olive-backed calling; June 13, bird lining nest; June 15, nest containing one egg; July 4, bird lining nest; July 5, bird incubating three eggs; July 24, bird in full song.

1910—May 27, bird in song; July 5, nest of three young five days old; July 7, nest of three young seven days old; July 26, last heard in song; August 21, last seen.

1911—May 15, first heard calling; May 26, in song; July 8, last heard in song.

1912—May 19, bird calling; May 2, in song; June 9, bird building; June 10, bird incubating four eggs; July 26, last heard in song; September 7, Olive-backed calling.

1913—May 19, bird calling; May 26, bird in song; June 3, bird incubating; June 23, bird incubating; June 29, nest containing two eggs, later four; July 31, bird in song; October 1, last seen.

One season the Hermit Thrush is the more common; he builds in distant woods on the fringes of clearings and open spaces, or he may build in glades in the less frequented thick-

ets that skirt pastures, fields, and much traveled thoroughfares; the following season the Olive-backed is the more conspicuous in numbers, and locates his nest in the same spots, save that the Hermit constructs his nest under the tree, and the Olive-backed places his nest in the tree. At times the Olive-backed is so common in the vicinity of dwellings that I have heard his vigorous melody from the post office corner.

Though the Hermit and the Veery are more glorious songsters than the Olive-backed Thrush, I doubt if either of them can compete with the latter in intelligence and vigor. His call notes *whit! and whit-yer!* and his song are distinctive, but he has a way of slipping into the underbrush when disturbed, that renders it difficult to trace his notes to their source. For this reason the Olive-backed Thrush has been confused with nearly all the other Thrushes.

The spring of 1913 brought large numbers of Olive-backed Thrushes to our locality; they nested in the narrow strips of virgin growth just outside the hay fields, quite as commonly as in the far away woodlands. Sitting in an umbrella blind before the nests of two pairs of Olive-backed Thrushes, the stillness was broken every few moments by passing automobiles. While the young Thrushes are in the nest, the male bird sings nearly all the time. I could but wonder why they chose such noisy spots in which to give their kindergarten exercises, when a vast woodland stretched away before them.

The nest of the Olive-backed is a bulky, statant, increment structure, located in the tree much after the fashion of the Robin's nest. Its rough exterior gives it a greater appearance of size than it really possesses. Because the nests are so large and so conspicuously placed, very many of them are pillaged by Crows, squirrels and other wild animals, and the household cat destroys vast numbers of the immature birds. Most of the nests that have come under my observation, have been found anywhere from one to ten feet above the ground, in firs and spruces. One was constructed in a hemlock, and another in a gray birch.

The birds build their interesting domiciles the first of June

The Olive-backed Thrush hears a movement in the blind.
(Photo by Cordelia J. Stanwood.)

and again the first of July. Whether they raise two broods or not during the season, I have been unable to determine. A clutch consists of from three to four green-blue eggs, spotted all over with cinnamon-brown. The spots have a tendency to mass themselves around the larger end. The bird lays an egg each day before 10 o'clock in the morning, and begins to incubate by 12 o'clock of the day on which the clutch is completed. Although the eggs are hatched so irregularly, I have never seen the bird incubating before the clutch was completed. I found young in the nest in 1908 on the twelfth and thirteenth days, and in 1913 on the tenth, eleventh and twelfth days from the beginning of the incubation period. The nestlings mature sufficiently to leave the nest in from ten to twelve days.[1]

The summer of 1913 I found two nests of the Olive-backed Thrush on the borders of hay fields, not far from much-traveled High Street, the Bar Harbor road.

The first nest I moved fifteen feet into the sun, trimmed off the branches so as to get a strong light upon it, and spent nearly all my time at this nest in an effort to secure good photographs of the parent Olive-backed Thrushes and the young. I was careful not to expose the nestlings too long to the hot sun, and always tied fresh branches around the nest on leaving the blind.

The second nest I simply trimmed around so that I could observe the Thrushes clearly while feeding and caring for the little ones. This nest, also, I shielded with branches when not observing in the blind.

Since, so far as I know, there is no study of the nest life of the Olive-backed Thrush, a detailed account of my experiences at this nest may be of interest to my readers.

June 29, 1913, I came upon the nest of an Olive-backed Thrush containing two eggs. The nest was constructed in

[1] June 2, 1908, found new nest of Olive-backed Thrush.

June 3 to 6, four eggs; 12 M., bird incubating. June 18, two young Thrushes; natal down not dry at 11 A. M. 4 P. M., three birds in the nest. June 19, four birds.

the crotch of a gray birch, formed by the bole of a sapling and a rudimentary branch about three feet above the ground. The nest was surrounded by fir branches. Each day an egg was added to the set until there were four. The afternoon that the clutch was completed, when I approached the nest, the bird was quite oblivious of every duty save that of incubation. She seemed unaware of my presence. Until this time I did not see the bird around the nest, yet the eggs hatched, as before intimated, at very irregular intervals.

The eighth day of incubation I placed the blind in the neighborhood of the nest, that the birds might get accustomed to it. On the tenth day, when I went to observe at the blind, the female was off the nest; I peeped in, and to my astonishment, beheld two young birds on which the natal down was entirely dry. The next morning at 9:30 there were three nestlings in the nest, and at 5:00 p. m. the fourth egg was still unhatched. On the twelfth day of incubation, at 11:55 a. m., there was a fourth young Thrush in the nest on which the natal down was not entirely dry.

I have studied no other bird whose eggs were hatched so irregularly, save the Black-billed Cuckoo. The Cuckoo begins to incubate as soon as an egg is laid, and does not always lay on consecutive days.[1]

In the case of the Olive-backed Thrush, the fact that the young came from the egg at such long intervals, seemed to be a wise provision of nature. The mother bird brooded the young, except during the rest period, for the greater part of the time during the first three or four days. She moved back on the nest, stood astride the young, and cared for one fragile chick at a time; she pecked him and touched him with her beak until he gave the food reaction readily, fed him by re-

[1] July 11, 1908, I found the nest of a Black-billed Cuckoo containing two eggs. The bird was brooding. Two days later there was a third egg. As nearly as I could determine, the three eggs were hatched on two consecutive days. The two older birds left the nest at the beginning of the climbing period, and the parents, it would seem, devoted themselves to the mature nestlings. I found the youngest dead in the nest after a rain storm.

Olive-backed Thrushes coming with food for her young.
(Photo by Alfred A. Langewald, Jr.)

gurgitation, ate the excrement, burrowed under the young, ate the parasites in the nest and on the young. Sometimes she did this as often as once in four minutes. The male, from the beginning, called the female from the nest regularly for the rest period and fed the young both fresh and chrushed and macerated food. In such a well-ordered nest there was no opportunity for a nestling to starve to death.

To distinguish the birds in nest two, I tied a cord to the leg of each nestling, and named them No. 1, No. 2, No. 3 and No. 4, in order of their coming to the nest.[1] No. 1 and No. 2 I found at the same time. Those I numbered according to their weight — No. 1 was the heavier. I tied three cords to the leg of No. 3, but in some way they were all removed on the following day.

The rapidity with which the young mature is most remarkable. Three of the young measured at birth 1 and 11-16 inches, the fourth measured 1 and 9-16 inches, and the young weighed respectively, No. 1, 70 grains; No. 2, 60 grains; No. 3, 46 and 1-2 grains; and No. 4, 60 grains. No 2 was the most sleepy bird in the nest. No 1, at the end of the ninth day, was the lightest in weight and had the longest wings, 2 and 3-16 inches. On the tenth day I succeeded in weighing and measuring but No. 2 and No. 4. (This was the eighth birthday of No. 4.) No. 4 was by far the heaviest and most active bird in the nest, weighing nearly 480 grains. He was not so heavily feathered as the others, his wings were a half inch shorter than No. 2's and his length was one inch less than No. 2's. From birth No. 4 was the most vigorous of all the young. At his first weighing he stood supported on his belly, heels and wings, the latter spread wide apart, held up his head and gave the food reaction all the time he was out of the nest. He fully possessed the power of orientation. The increase in weight of this young bird was very marked. He very nearly multiplied his original weight by

[1] I borrowed this device for distinguishing the nestlings from "At the Sign of the Northern Flicker," by Althea R. Sherman. The Wilson Bulletin. Sept.-Dec. 1910.

eight in eight days. It was as if a baby that weighed ten pounds at birth increased his weight at the rate of twenty pounds on the second day, eighty pounds on the eighth day, and one hundred and sixty pounds on the sixteenth day. The gain in weight of No. 3 that weighed 46 and 1-2 grains in the beginning was even more remarkable. On the eighth day No. 3 weighed 420 and 1-2 grains.

Specific notes on the daily progress of the four young Olive-backed Thrushes.

July 11, the *beginning* of the first day in the nest. As before stated, on the tenth day of incubation, at 11:30 a. m. I found two limp young Thrushes lying prostrate in the nest. They had been out of the shell sufficiently long for the dark, burnt-umber, natal down, one-half inch long to dry. The birds, including their beaks, feet, and legs were a tint of burnt-orange. They rested on the belly, had a tendency to curl up in the form of an egg and roll until stopped by the legs and wings.

The *end* of the first day. The three oldest birds lay prone in the nest, vibrating as one. One gave the food reaction in the nest, but when removed from the nest, none gave the food reaction. Their beaks, feet and legs were a trifle yellower than the rest of the body.

The *end* of the second day. The three oldest birds bid not gave the food reaction out of the nest. The natal down on the fourth nestling at 11:55 a. m. was not entirely dry. When

Length of Body.	(ALL MEASUREMENTS IN INCHES.) Bird 1.	Bird 2.	Bird 3.	Bird 4.
July 11.....	1 and 11-16	1 and 11-16		
July 12.....	2	1 and 3-4	1 and 11-16	
July 13.....	2 and 3-16	2 and 1-8	1 and 7-8	1 and 9-16
July 14.....	2 and 9-16	2 and 11-16	2 and 1-16	1 and 13-16
July 15.....	2 and 13-16	2 and 14-16	2 and 9-16	2 and 1-32
July 16.....	3 and 1-8	3 and 3-16	2 and 11-16	2 and 1-4
July 17.....	3 and 1-2	3 and 5-8	3 and 1-8	2 and 11-16
July 18.....	3 and 5-16	3 and 5-16	3 and 3-8	2 and 7-8
July 19.....	3 and 3-8	3 and 5-16	2 and 13-16?	3 and 3-8
July 20.....	3 and 3-4	3 and 3-4	3 and 7-16	3 and 3-8
July 21.....		4 and 11-16		3 and 5-8

Young Olive-backed Thrushes, 10 days old, begging for food.
(Photo by Alfred A. Langewald, Jr.)

Length of Wing.	Bird 1.	Bird 2.	Bird 3.	Bird 4.
July 11.....	1-8	1-8		
July 12.....	5-32	5-32	1-8	
July 13.....	3-16	3-16	5-32	1-8
July 14.....	3-8	3 8	3-16	5-32
July 15.....	9-16	7-16	3-8	3-16
July 16.....	3-4	11-16	9-16	5-16
July 17.....	1 and 1-8	15-16	13-16	5-8
July 18.....	1 and 7-16	1 and 5-16	1 and 1-8	13-16
July 19.....	1 and 7-8	1 and 9-16	1 and 9-16	1 and 1-8
July 20.....	2 and 3-16	2	1 and 15-16	1 and 11-16
July 21.....		2 and 5-16		2

Weight	Bird 1	Bird 2	Bird 3	Bird 4	
July 11.	70 grains	60 grains			All the Nestlings.
July 12.	86 and 1-2 grains	70 grains	46 and 1-2 grains		Beginning of the first day.
July 13.	125 grains	99 and 1-2 grains	84 and 1-2 grains	60 grains	End of the first day.
July 14.	210 and 1-2 grains	180 grains	138 grains	91 grains	
July 15.	273 grains	258 grains	206 grains	169 and 1-2 grs.	End of second day.
July 16.	320 and 1-2 grains	310 and 1-2 grains	258 grains	205 grains	
July 17.	349 and 1-2 grains	358 and 1-2 grains	305 grains	285 grains	
July 18.	364 and 1-2 grains	401 and 1-2 grains	375 grains	343 grains	
July 19.	292 and 1-4 grains	418 and 3-4 grains	418 and 3-4 grains	418 and 3-4 grs.	End of third day.
July 20.	390 and 1-4 grains	422 and 1-4 grains	420 and 1-4 grains	440 and 1-4 grs.	End of fourth day.
July 21.		445 and 1-4 grains		Considerably more than 445 and 1-4 grs.	End of the fifth day.

Birds limp, prostrate in the nest, a tint of burnt-orange, natal down one-half inch long.

A swollen, powder-colored band extends across the wings, and down the upper part of the spine.

Eyes beginning to open.

Tips of quills extend beyond the wings. Dark pores on head; a few enlarged pores on the underparts and rump, a dark, swollen band down the spine, across the coccyx and wings.

All the feather tracts well indicated.

Quills across the coccyx.

Birds well covered with quills and pin feathers.

Quills look light at the tip as they do just before the feathers begin to protrude.

Birds make the preening motion.

Feathers begin to appear. Birds preen.

End of the sixth day.

End of seventh day.

Birds pretty well feathered out.	End of the eighth day.
Quill casings have nearly disappeared.	End of the ninth day.
Feathers practically free of quill casings.	End of the tenth day.

placed on my dress, No. 4 raised himself from his side, turned over onto his belly, supported himself by his wings and heels, and gave the food reaction all the time he was out of the nest; he threw himself about on the scale pan so that I had to guard him constantly to keep him from throwing himself out of the pan entirely.

The young, as before, nestled together in the middle of the nest, vibrating as one, their heads falling over each other.

The *end* of the third day. All the young, save one, gave the food reaction when out of the nest. They rested on their feet and wings as well as the belly and moved forward on my dress. Still their heads rested on one another in the nest, and they lay in a limp, vibrating mass.

The *end* of the fourth day. The young changed their position in the nest, twittered when being fed, panted with the heat, and gave the food reaction when they heard sounds around the nest. One young bird lay with his head held up against the rim of the nest, and one yawned.

The *end* of the fifth day. All the young seemed very strong and rested their heads against the rim of the nest, all gave the food reaction when out of the nest and moved forward on my dress. I had all that I could do to keep any of them on the scale pan. The two older birds grasped the edge of the pan with their claws. The rough interior of the nest enabled them to move about freely.

On this day, one of the birds fed a large, green caterpillar, the larva of the cherry spinx moth, I think, to one of the young in a peculiar manner. At both the first and second nest, the parent birds usually thrust the insects well down into the throat of the young. The Thrush laid this large caterpillar across the open beak of the birds several times. Nestling after nestling attempted to swallow the caterpillar, but if the end remained in sight, the bird drew it from the throat again.

Olive-backed Thrush bristling while shielding young from sun.
(Photo by Cordelia J. Stanwood.)

She continued this treatment very rapidly, until the young became so excited and eager for the caterpillar that when it touched a throat in which the food reaction was just right, it instantly glided out of sight.

The beaks of the young were much soiled with mud. Probably, some of it came from earthworms as I noticed the birds feeding them to the young in both nests. Aside from this, the young and the nest were immaculate.

The parent birds called to the young constantly when they were removed from the nest so that I found it almost impossible to take their weights or measurements. The muscles of the nestlings were so strong that they drew themselves up into the sitting posture, and were apparently uncomfortable when obliged to assume any other position. After this day their body measurements were far from satisfactory.

The *end* of the sixth day. One bird pecked slightly at his pin feathers and quills, but there were no loose casings as yet. Another snapped his beak as if at an insect. The tips of the quills were lighter as they are before the feathers begin to protrude. This was the closing day of the quill stage.

The *end* of the seventh day. All the birds had speckled heads. No. 1 walked readily on my lap, without spreading his wings to balance himself, leaped from the tray, looked into my face in an interested way, fell from a stool and alighted on his feet, twittered a great deal, gave the food reaction, and a chirp of alarm. The excrement of the older birds began to resemble that of the more mature bird. No. 1 and No. 2 preened a great deal. No. 3 not at all; and No. 4 was still in the quill stage. No 3 had very few feathers, but he did have a few.

The *end* of the eighth day. One bird winnowed the air with his wings, and scratched his ear with his toe; the birds gave the food reaction out of the nest. I had much difficulty in returning the two larger birds to their cradle.

The *end* of the ninth day. All the birds have speckled heads. The birds that hatched last have been much more active than those that came from the egg first. They have

gained their weight more rapidly than the more mature nestlings, but it has taken all the nestlings practically the same length of time to produce pinfeathers, quills and feathers. The two young birds that came from the egg last, gained their pin feathers, quills, and feathers a few hours earlier than the two that hatched first, I should say. Young Hermit Thrushes develop their feathers in the same length of time that young Olive-backed Thrushes do.

All the young beg for food in the nest and out.

The two older birds watch every movement of leaf or insect around the nest and listen to every sound. They notice particularly the mother bird when she unfurls her wings and flies away. They stretch frequently. Three of the young snapped at a mosquito several times. No. 1 stood on the edge of the nest a few seconds, walked a few steps, then hopped into the nest; the young clung to the nest lining with their sharp claws when I attepmted to take them out.

The *end* of the tenth day. The young Thrushes are large beautiful birds; at this stage a Thrush has flesh-colored legs and feet, a brownish-gray beak, hazel eyes, the beginning of an olive tail and olive wings, a golden mouth and throat lining, an arrow-shaped tongue, and a very slender, V-shaped groove in the top of the mouth; this groove, edged with spines, ends above a salivary gland at the base of the throat. The crown and nape are olive-brown, spotted with buffy, the eye-ring is buffy, the back is olive-brown with a buffy line down the middle of each feather. A black line runs down each side of the throat which is washed with buffy; the breast and sides are washed with buffy, and the breast and white belly are spotted with black. A young Hermit Thrush differs from a young Olive-backed chiefly in having *bright cinnamon tail coverts.*

The birds exercise constantly, changing position, panting with the heat, gaping, yawning, snapping at insects, stretching, preening, giving the food reaction, muting, standing to strengthen the legs, and winnowing the air with the wings. One hopped onto the edge of the nest, and then hopped back into it again.

Young Olive-backed Thrushes after being fed.
(Photo by Cordelia J. Stanwood.)

When I attempted to weigh and measure the young, No. 2 was very gentle after being well fed, but the parent birds called the young so tactfully that No. 4 began to respond, and at last became so wild that I was obliged to desist. I succeeded in getting the length of No. 2 and No. 4, the weight of No. 2, and the approximate weight of No. 4. The birds in the nest that I photographed left on the afternoon of the twelfth day. The birds that I weighed and measured, were driven from the nest by the parent birds after I attempted to weigh and measure them at the close of the tenth day.

After the young began to feather out, it was well nigh impossible to return them to the nest. No. 4 was the most troublesome of all the birds in this respect. On the eighth day of nest life, I had to resort to strategy to get any weights and measurements at all. I put the nest in a grape basket and tied the basket to the tree. This gave the nestlings plenty of room, and enabled me to move the nest into the tent without disturbing the young.

On the ninth day, I began to feed the young with bread and milk before moving the basket, and before returning it to the tree.

For the first few days of nest life, when I weighed and measured the young the parent birds disappeared; later a bird fed the young several times during the feeding process, and on the fourth day, the female returned to brood three times while part of the neslings were out of the nest. When I moved the nest to the blind, the feeling of the parent birds became very tense. On the last day their fears knew no bounds; they uttered a most seductive and elaborate vocabulary of baby-talk, they entreated, they scolded, they flew around the blind snapping their beaks; finally, as I related earlier in my story, the youngest nestling answered the calls of the parent birds and became very wild, I could do nothing with him but hold him in the nest. At last all were quiet in the nest, and the nest in place again, but the very tameness of the young, added anew to the frenzy of the parent birds. (Fear is one of the instincts cultivated in the Kindergarten of the birds).[1]

I hurriedly withdrew but heard the parent birds still calling to the young when I reached the street beyond the hayfield. Upon my return an hour later, the nest was empty.

The mother bird seems to both incubate and brood; when brooding, she frequently changes her position on the nest to accommodate herself to the wriggling young, she cleanses the nest and young of parasites, shields the young from the sun and rain. The male and female feed the young both fresh insects and by regurgitation. The male calls the female from the nest for the rest period. She flies to meet him with a *Phieu!* or a *Whit-yer!* of delight. The instinct of fear is more in abeyance in the female than in the male. Sometimes the latter after some change has been made about the nest, refuses to feed the young for long periods, but he calls lustily to his mate, if she suspends her attentions to the young for any unusual length of time.

The male alights on a conspicuous perch near the nest, off and on, where he flutters all over while he regards the mate on the nest or the young in it. After the young are hatched, the male seems to bring the food to the young instead of his mate. Whether he fed the female during the incubation period I was unable to learn as the eggs were so surprisingly prompt in hatching.

Both birds either eat or carry away the excrement. In the second nest, the bird carried away the ordure for the first time on the ninth day. At this age the young ate so much that the parents ceased to feed everyone at each visit. One or more was omitted at each feeding, and one excrement was usually carried from the nest. In the nest that I photographed, the parent birds still ate some excrement on the twelfth day.

Every time that I see the birds performing this rather abnormal act, it suggest a question. Why? It would seem as if there must be some very good reason for the instinct

[1] I saw something similar to this once in the case of a Partridge. I flushed a brood of very young Partridges; most of them scattered and concealed themselves, but one fledgling stood still in the open. The old bird called, then flew at the nestling and dealt it a fierce blow that caused it to seek shelter at once.

which prompts birds so universally to eat the ordure of the young for varying times in different nests.[1]

This summer, I made a discovery that may possibly throw some light on the question. When a Blue-Headed Vireo family vacated their nest, I found in it two dried excrements. The sacs had been in the nest so long that they were discolored; they were lost evidently when the gelatinous encasing sac was a conspicuous part of the excrement. The sacs were full of the eggs of the rosy maple moth.[2] This fact proves that during certain stages in the nest life, the food of the nestling is but partially digested. Some of the eggs were whole. Whether the eggs were fertile or not, I was unable to find out but it is just possible that this universal tendency of the birds to eat the excrement, is another of nature's wise provisions for our further protection from our insect foes.

As already attested the female Olive-backed feeds the young almost entirely by regurgitatin, sometimes as often as once in four minutes. When the female returns from her rest periods, she brings fresh insects with her, and the male also feeds the young regularly fresh insects as well as crushed and mascerated food. At first, small, soft insects are administered, later, larger, tougher insects.

I found the first two Thrushes in the nest at 11:30, and weighed and measured them a little after 12:00 o'clock. Each day the weights and measurements were taken as nearly at this hour as possible. For days and days we had a slight thunder shower at noon that interfered with work a trifle. When I observed in the morning, it was the end of an observation day, and the afternoon was the beginning of an observation day, in other words, I reckoned time from the noon that I found the two young Thrushes in the nest.

[1] Home Life of Wild Birds. By Dr. Francis Hobart Herrick. Page 191.

[2] Kindly identified by Prof. Charles P. Alexander of Cornell University.

The *end* of the third day and the *beginning* of the fourth, I observed in the blind eight hours — from 5:34 a. m. to 4:54 p. m. During this time I left the blind for two hours and one hour. This day the female fed the young seventeen times by regurgitation, and both birds made thirty-three visits to the nest with insects. Spruce bud moths were fed fifteen times during these visits. From two to twelve moths were fed at a time but they were mostly brought by the beakful. Caterpillars were administered thirteen times. The quantity varied from one to a beakful. Usually the birds brought a goodly number. We must remember that while some of these birds were three days old, the youngest was but one. All four were fed on all of these visits.

Near the *end* of the fourth day I observed five hours in the morning. The female fed the young twelve times by regurgitation. The birds brought food to the nest twenty-four times. During these visits, spruce bud moths were fed seventeen times, and caterpillars thirteen times.

Near the *end* of the fifth day, in the forenoon, I observed two hours and fifty minutes. The female fed the young once by regurgitation; the birds made eighteen visits to the nest, fed spruce bud moths ten times, and caterpillars seven times.

Near the *end* of the sixth day, before noon, I observed three hours. The birds fed the young twenty times. During this period, caterpillars were brought eleven times and spruce bud moths thirteen times.

The length of a feeding day of the birds consists of about fifteen hours. In making out these notes, I was unable to take into consideration the number of insects eaten by the two mature, active birds, those fed by regurgitation to the young, or those held in the mouth and throat when the birds came to the nest with overflowing beaks. From the observations, however, one can form a slight idea of the enormous quantity of spruce bud moths and caterpillars consumed during the ten or twelve fifteen-hour days of nest life. The parent birds continue to feed the fledglings for some time after they leave the nest.

Besides spruce bud moths, I saw the Olive-backed Thrushes feed to the young a large glow worm larva, I think, wild fruit, crane flies, flying ants, grasshoppers, orange worm-like larvæ, cut worms, all colored inch worms, geometrid moths, yellow-green caterpillars, gray-green caterpillars, tan, brown, black caterpillars, the caterpillar of the cherry sphinx moth, several caterpillars of the rosy maple moth, also *Holomelina opella*, many tan and brown moths, and I found one mutilated rosy maple moth under the nest.

Some excrement that the young left in the nest were kindly examined for me by Professor Charles P. Alexander of Cornell University. Professor Alexander found the remains of several ground beetles, myriads of scales of moths, part of an ant, and part of a spider.[1]

The young of the Olive-backed Thrush are extremely intelligent and vigorous. I took a young Olive-backed Thrush from the nest, ten days old, at 9 a. m. He was a wild, chirp-

[1] Excrements examined by Prof. Charles P. Alexander.

Six intermediate antennal segments of a beetle, apparently a ground beetle, (*Carabidæ*).

Myriads of scales from Lepidopterous wings, which shows that scores of these insects must have been eaten, wings and all. They are probably moths (*Heterocra*) rather than butterflies (*Rhopalocera*). The part of a membrane of wing of some moth of small to medium size, representing the cubital and anal fields of the wing.

Mandible and head of medium-sized ground-beetle (*Carabidæ*).

Elytra and abdomen of a small beetle, apparently a *Lathridid*.

Cheliceræ of a small spider.

Head of a large ant, probably *Camponotus*.

An abundance of femora, and tibiæ of various small insects, mostly being beetles, apparently.

Five heads of an hymenopterous insect thought (by Dr. A. D. MacGillivray) to be a bee; these heads exceedingly convex and very coarsly punctured.

Caudal end of a pupa of some insect, with four caudal hooks, and a broken ring of subcaudal hooks.

The most conspicuous single element of the excrement is the myriad of lepidopterous scales, which to judge from the great diversity in size, shape, and texture, must have represented a very considerable range of species.

ing, struggling, bit of bird. At 12 m. he would perch on my arm, or the edge of the basket, as we walked through the woods, snap at a mosquito, take a bit of strawberry with the tip of his beak, but he refused to open his beak to be fed. I placed him on the sill of a screened window; on a rug in the middle of the floor were water, grasshoppers, wild fruits, earthworms, and ants' eggs. I attempted to feed him bits of these with the scissors. He would have none of them. He did nothing but chirp. I was obliged to leave him until 4:30 a. m. As soon as I came in I sat on the mat, and took up the scissors to prepare some food. When the Thrush heard the scissors click, he flew from the window to the floor, and opened his beak for food. He ate two earth worms, cut up. After this, he perched on my knee and preened his feathers. He continued, in the future, to take his food with delight.

The third day of his visit with me, the Thrush flew from the window to my note book and nibbled at my pen. I smoothed his feathers with one finger. He perched on my shoulder and snuggled against my throat.

The fifth day after he came to me, I was again writing. The little Thrush flew from the window to my note book, backed across the page until his tail feathers touched my hand. I smoothed his head and back. He turned his breast to have that caressed likewise. I thought that, perhaps, it was all an accident. Twice, I returned him to the window sill, and the second and third time, he returned in like manner, and presented first his back and head, then his breast to be caressed.

The same day he picked up ant eggs from the floor, also an ant, and showed an automatic tendency to pick up everything. The little Thrush was very funny when he picked up an ants' egg or an insect. He opened his mandibiles far too wide, twisted them awry while he examined the morsel first with one eye, then with the other. All this time, he kept up an excited twitter. Later, he picked up thirty ants' eggs from the floor at one meal. On another occasion, he flew into my basket when I returned from the pasture, selected a grass-

hopper, flew away with it and ate it. He also began to sing an irresistable baby Thrush song on the fifth day.

It was several days after the Thrush was out of the nest before he would take a bath. I find that young Hermit and Olive-backed Thrushes will bathe instinctively on sight of the water but not until several days after they have left the nest.

The little while that I kept this Thrush in the house, he was a never ending source of wonder and delight.

The nest of the Olive-backed Thrush, likewise, is peculiarly interesting. It, too, gives rise to a question.

The typical nest of the Olive-backed consists of three parts, the foundation of twigs, stems, and moss, an interlining of dead wood, and the lining proper of skeletonized leaves, with occasionally a little usnea moss, or black, hair-like plant fibre. Twice in nests on the outskirts of a peat bog, the bird used the peat with roots for an interlining. One of these nests contained such a perfect cup of mud that if I had found it without the birds in it I should have said that it was an old Robin's nest.

Does this indicate that the Olive-backed Thrush once used a mud interlining in its nest, or does it simply show that under suitable circumstances the bird could easily adapt himself to such a style of architecture?[1]

The voice of the Olive-backed is wild, sweet, suggestive of the cool, damp woods, the misty, dewy splendors of early dawn and late twilight, although during the nesting season the bird sings all day long. The song of the Olive-backed may be characterized as energetic, that of the Hermit as tranquil. The spirit of the former is "Let us be up and doing!" — *Wher-a-whee-ŏo!* or Work-for-we-two! The spirit of the latter is, "Praise, Praise, the Creator!" "Peace, my peace I give unto you!" One entire afternoon, when sitting in a balsam blind near the nest of a Hermit Thrush, I tried to translate the song of an Olive-backed Thrush into words. This is what he seemed to say: "I'll roam the world; I'll

[1] Nest and Nest Building in Birds. Part 2. Page 263. By Dr. Francis H. Herrick

roam the world with thee; I'll roam the world with thee, with thee!"

The Olive-backed Thrush has many call-notes. One, suggestive of a profound sigh is identical with a call of the Hermit. It denotes the deepest solicitude. The note *Whoit!* is common to both birds. It is difficult to distinguish the *Chu!* of the former from the *Chuck!* of the latter. The *Whit!* of the Olive-backed Thrush is distinctive and corresponds to the *Peep!* of the Hermit Thrush. He utters *Schree!* very gently to the young in the nest. On similar occasions the Hermit says *Phee!* Besides these call-notes he has a delightful crooning twitter, a whistle that he gives when feeding the young, and the notes *Whit-yĕr!* and *Phieu!* The latter he uses when summoning his mate from the nest; they are little more than nasal snarls.

In the evening, when the Thrushes come to the swale around the boiling spring to drink and bathe, the Hermits exchange the calls *Peep!* and *Chuck!* The Veeries salute each other with the notes *Phieu!* and *Eureke!* while the Olive-backed Thrushes interchange the calls *Whit! Whit-yĕr* or *Whit-yĕr-ĕr.* After once having traced these calls to their source, there is not the slightest danger of confusing the birds that make them.

During the nest life of the Olive-backed Thrushes in the first nest the male sang nearly all the time (June 23, 1913), but it was not until the young were nearly ready to leave the second nest (July 15, 1913) that the Olive-backed began to preface each measure with one or two call notes, until he had exhausted his vocabulary. The song ran something like this: *Whit! Wher-a-whee-ŏo! Whoit! Wher-a-whee-ŏo-whee-chee! Whit! Whit-yer! Wher-a-whee-ŏo-whee-chee-tee! Schree! Wher-a-whee-ŏo! Chu! Wher-a-whee-ŏo-whee-chee!* I have heard the bird sing through his entire repertoire of call notes several times without stopping. This year he kept up this frenzy of song until the end of the song period (July 31, 1913).

The Veery is the first of the Thrushes to leave. Each year

he comes from the swales to the higher land with his entire family, about the last of July. He calls all about the house and grounds for a few days and then vanishes in the direction of the seacoast. Occasionally about a month later a few migrants are heard around the spring.

The Olive-backed Thrush remains until the wild fruits grow scarce, near the last of September, and the Hermit, the first to come, is the last to go. Rarely, he lingers into November.

GENERAL SUMMARY.

The Olive-backed Thrush comes to his northern breeding ground from the district between Mexico and South America, about the last of May, and departs near the middle of September.

The first of June and again the first of July, they construct their statant increment nests, usually in an evergreen, anywhere from one to ten feet above the ground. Whether they raise two broods or not during the season I have been unable to determine. A clutch consists of from three to four green-blue eggs, spotted with golden-brown. One egg is laid on each consecutive day until the clutch is completed. The birds spend from ten to thirteen days in incubation, and the young remain in the nest from ten to twelve days.

The Olive-backed Thrush is modestly but richly garbed, gracefully proportioned, exquisitely light in motion, extremely intelligent and tractable. They devour and feed to their young an incredible number of our most injurious insect pests. The male bird is one of our rarest musicians. While not such a glorious singer as the Hermit or Veery, we could ill spare his voice from our inimitable Thrush concerts.

I would sum up the entire life of the Olive-backed Thrush, as a poem of service to his brother — man — set to stirring music.