

NESTING OF HARRIS'S SPARROW (*ZONOTRICHIA
QUERULA*) AT CHURCHILL, MANITOBA.BY JOHN BONNER SEMPLE AND GEORGE MIKSCH SUTTON.¹*Plates VI-VIII.*

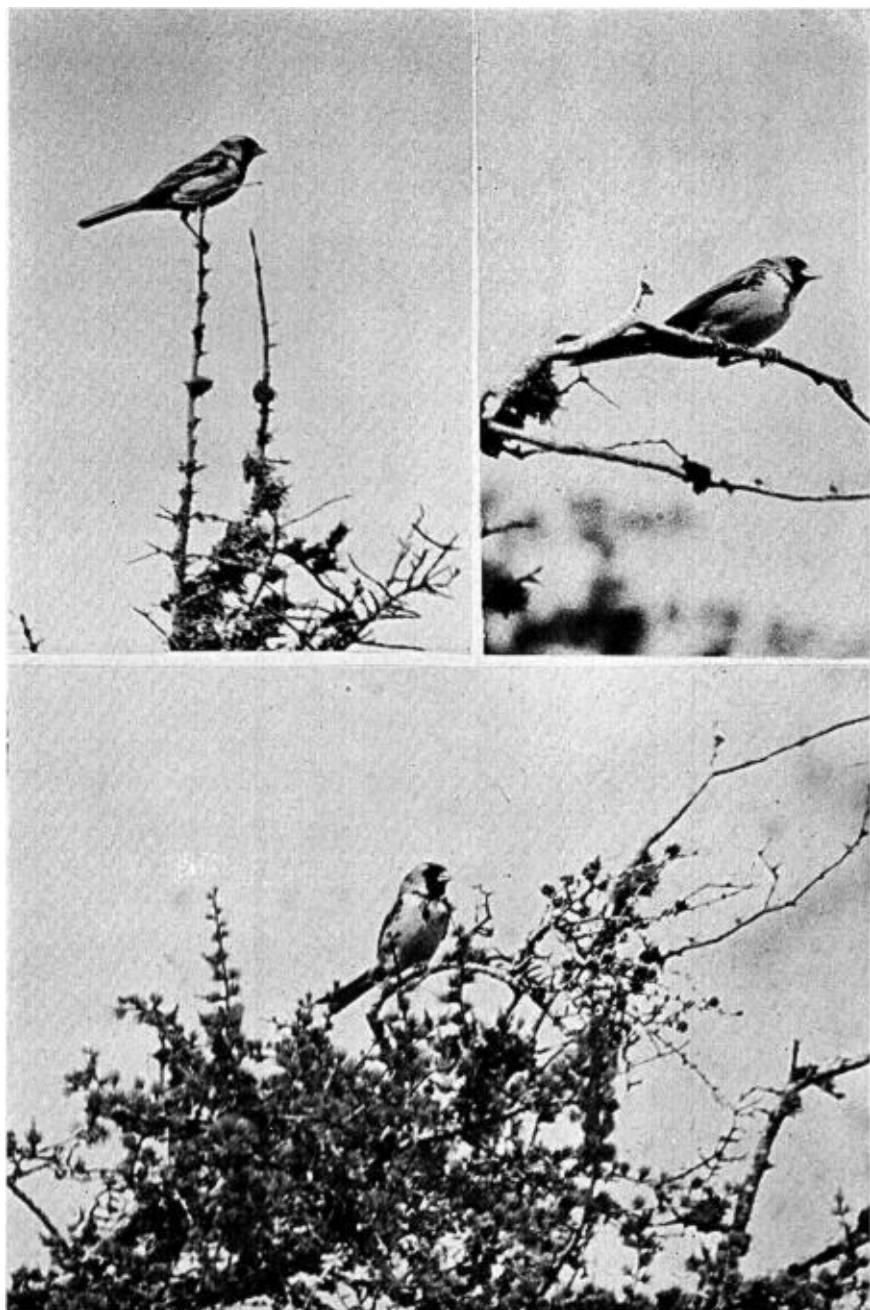
UNDER a thin clump of slender, tough-twigged Labrador tea, whose outermost branches bear at their tips pale green bud clusters, and whose narrow, downward-slanting leaves glisten in the spruce-filtered sunlight; cupped in the damp crown of a sphagnum island-hummock among the conifers, its rim only a few inches above the ice-filmed water, is a nest lined with fine grass. In this nest, and shadowed so deeply as to appear of a dark, indefinite color, are four eggs. Such is man's first recorded glimpse of the eggs of Harris's Sparrow in the wilderness summer home of the bird.

The story of the discovery and naming of this handsome sparrow,² of the mystery which so long surrounded its nesting ground, and of the all but century-long search for its eggs, forms one of the most interesting chapters in the annals of American ornithology. Harry Harris ('The Auk,' Vol. XXXVI, 1919, pp. 180-190) has given us such a full account of the earlier discoveries of the species by Nuttall, by Maximilian, Prince of Wied, and by Audubon; and Professors Myron H. Swenk and O. A. Stevens ('The Wilson Bulletin,' Vol. XLI, 1929, pp. 129-177) have presented such an exhaustive treatise on its behavior during migration and in winter, that now there is need for no more than a discussion of the spring and summer activities of the bird in its northern nesting ground.

The breeding range of Harris's Sparrow is now believed to

¹ The authors are deeply indebted to Mr. Bayard H. Christy, of Sewickley, Pennsylvania, for a critical reading of this manuscript; to Mr. W. E. Clyde Todd, of the Carnegie Museum, Pittsburgh, Pennsylvania, for assistance in measuring, describing, and photographing the eggs; and to Mr. Percy A. Taverner, of the Canadian National Museum, Ottawa, Ontario, for many helpful suggestions.

² The fact that Nuttall's English name "Mourning Finch" has been superseded by Audubon's "Harris's Finch," whereas his classical name *querula* has endured, is highly interesting to students of ornithological nomenclature. "Mourning Sparrow" would, indeed, be a fitting name for the black-cowled, sad-voiced bird. Audubon named the sparrow (*Birds of America*, 3 vo. Ed., Vol. VII, 1844, p. 331) after his "excellent and constant friend EDWARD HARRIS, ESQ.," who apparently shot at least two of the specimens upon which Audubon based his description.



Photos by O. S. Pettingill, Jr.

HARRIS'S SPARROW NEAR NEST, CHURCHILL, MANITOBA.

extend from the region of Churchill, on Hudson Bay, westward and northwestward to the eastern shore of Great Bear Lake, probably throughout the belt of stunted trees which is characteristic of the Hudsonian Life Zone, just south of the vast Arctic Barren Grounds. This breeding ground has been more or less definitely known for thirty years; yet prior to the spring of 1931 no ornithologist, to the best of our knowledge, had ever seen a nest with eggs. The reason this part of the life-cycle of the species has remained so long unknown is not that the bird is especially rare, or of local or irregular occurrence, but that, up to the year 1929, the region where it nests was all but inaccessible in the nesting season.

The completion of the Hudson Bay Canadian Government Railway in 1929 opened up a vast territory, a territory which holds much of interest for the ornithologist. The terminus of this railway, Churchill, Manitoba, is the very point at which Edward A. Preble (1902, *A Biological Investigation of the Hudson Bay Region*, pp. 120-121), in 1900, and Percy A. Taverner,¹ in 1930, found Harris's Sparrow common during the summer; and it was at this convenient point that our expedition decided to center its activities during the spring of 1931.

Churchill (formerly known as Fort Churchill) is situated at the mouth of the Churchill River, in Latitude 59° N., directly north of extreme eastern Kansas, Oklahoma and Texas. Our party was composed of four men. There were, in addition to the authors, Mr. Bert C. Lloyd, of Davidson, Saskatchewan, an active young collector who had had three years of field experience in the Churchill region, and Mr. Olin Sewall Pettingill, Jr., of Middleton, Massachusetts, who accompanied us principally in the capacity of photographer.

The trip from Winnipeg to Churchill, via The Pas, required but three days and we were comfortable in our antiquated Pullman car, even on the last lap of our journey, although the aspect of the countryside became more wintry hour by hour as we moved northward. The crossing of this same country in spring, by dog-team, afoot, or by canoe (and formerly no other means were available) would have required weeks.

¹ The report on Mr. Taverner's field work in the Churchill region has not yet appeared.

At The Pas, on May 23 (a bright, pleasant day), we saw many Harris's Sparrows, most of them in flocks of six or eight individuals, and heard many in full song. They were especially abundant along the wooded shore of a small lake at the edge of town and in the open spruce forest where, among the dead leaves under the shrubbery they scratched noisily. Here we noted also two pairs of White-throated Sparrows (*Zonotrichia albicollis*), the males in full song.

On May 24, at Gillam, 326 miles northeast of The Pas, we saw neither Harris's nor White-throated Sparrows, though two Gambel's Sparrows, *Zonotrichia leucophrys gambeli*, a Tree Sparrow, a few Lapland Longspurs, a few Robins, a Flicker, three Greater Yellow-legs, a Baird's Sandpiper, and a Semipalmated Plover were observed not far from the railway station. Gillam lies in the migratory path of Harris's Sparrow, so the reason we did not find the species there is probably that it had not yet arrived. Whether or not the White-throated Sparrow occurs there in summer we cannot say.

As we journeyed northward from Gillam, we passed through spruce forests which gradually became lower and thinner. The terrain was monotonously flat, save where the railway followed or crossed a river. Everywhere among the trees were snowdrifts, many of them evidently five or six feet deep; snow flurries frequently enveloped the train; flocks of migrating Snow Buntings and Lapland Longspurs flew about us, bounding low over the woodlands. Finally, when within a hundred miles of Churchill, we began to cross great stretches of open, treeless barrens, moss and grass-covered tundra, between the tongues of spruce forest.

At Churchill we stepped from the train into the midst of a great, winter-bound construction camp. Here were barracks for sixteen hundred workmen; on the river bank stood a huge, flat structure which appeared to be a solid cement block: the beginnings of a gigantic elevator which, when finished, would provide storage space for two and one half million bushels of grain; this way and that led narrow-gauge railway tracks, over which, later, dinkey engines were to run, pulling gravel-cars, work-cars, and water-tanks; on the hill stood mission buildings, small, one roomed, wooden bank buildings, a motion picture 'palace,' the headquarters



Photos by O. S. Pettingill, Jr.

NESTING SITE AND NEST (NO. 2) OF HARRIS'S SPARROW, CHURCHILL, MANITOBA.

of the Royal Canadian Mounted Police, and a wireless station. This was Churchill, a port in the making.

As we piled our baggage upon a tractor-truck, we stumbled through wet snow two feet deep. To the southward of the rocky ridge which extends along the shore of the bay the snowdrift was twenty feet deep; the mile-broad river was frozen shut for miles inland from its mouth; the bay, at the very mouth of the river, was more or less open, but beyond lay a vast, dreary waste of ice chunks, packed solidly enough in some places to permit crossing afoot or with dog-team and *komatik*, but elsewhere moving about with tide, wind, and river current. Our tent was pitched at the river mouth, in a little gully among the rocks.

On the following day we learned that by walking inland along the eastern bank of the river for about six miles we might reach wooded country. There, amid waist-deep, ice-sheeted pools, slushy, gray drifts, and mud-bottomed muskeg streams, were to be found thick stands of spruce trees, some of them thirty, perhaps even forty feet high, with trunks a foot or more in diameter at the base; tamaracks, not yet hung with their lacy foliage; willows, in thick tangles at the edges of the spruce woods; and low shrubs, with narrow, rhododendron-like leaves. Between the woodlands and the river mouth, and not more than half a mile inland from the bay, was an area thickly set with small, ice-bound lakes.

To the west of the river rose rock-faced hills, on whose sheltered slopes grew irregular patches of stunted spruce, and north of these extended a long, barren point which formed the eastern shore of Button's Bay.

On May 25 we recorded among other summer resident species, Lapland Longspurs, Pipits, Horned Larks, Pintails, and Semipalmated Plovers. Furthermore, we found that, although there was much snow everywhere, there were also extensive bare areas on the open tundra and along the exposed ridges, and that some of the smaller, shallower ponds were actually partly open.

The temperature, these first few days, ranged from 28° F. to about 60° F. during the daytime. Most of the time the mercury stood disagreeably near the freezing-point. It was colder at night, of course. We had considerable rain and snow. The wind was usually from the north.

According to our observations, Harris's Sparrow arrived from the south in the Churchill region, on May 27, a chilly, windy day. On this date, three were seen in the low bushes along the river bank, not more than a mile and a half inland from the mouth, and at least four miles from the spruce woods in which the birds were reputed to nest. A female, with unenlarged ovaries, was collected. On the following day a single bird was seen among the rocks near our tent. It was scratching in the moss in the shelter of a huge boulder. It suddenly stopped searching for food, lifted its head, and sang. The simple, whistled notes were the more beautiful because of the roughness of the day and scene.

We continued to see a few Harris's Sparrows here and there on the Barren Grounds (that is to say, on treeless areas), nearly every day during late May and early June. On May 30, a bright, calm day, we collected a singing male near camp. On June 5, two females were taken among the willow bushes along the river bank, about five miles from the spruce woods. The ovaries of these specimens were, we found, not at all enlarged. We were at first puzzled that the birds should linger in these inhospitable, treeless surroundings, and scarcely knew whether to look for nests in the woodlands or on the tundra; we finally decided, however, that individuals seen in the open country were migrants, *en route* to more northerly or northwesterly nesting grounds.

We observed daily, from the first of June on, Harris's Sparrows. In our study of them we encountered difficulties. The territory where the birds were most numerous was so far distant from camp that, unless we were fortunate in meeting and hopping a gravel- or water-train, we had to walk from five to eight miles before we could begin the day's operations. The weather was frequently disagreeable; it rained, sleeted, or snowed, and we had wind and sometimes fog to contend with. We could work in the bush with comfort, even on stormy days, however; and, fortunately, the country in which we usually worked was not thickly set with quaking muskeg bogs. The coloration of male and female birds is so similar that we found we could not distinguish the sexes in the field; we could not, therefore, give our undivided attention to the nest building fe-

¹ It is our belief that only the female builds the nest, since this is the rule among other members of the genus *Zonotrichia* with which we are acquainted.



Photo by S. Prentice and J. B. Semple.

EGGS OF HARRIS'S SPARROW.

males.¹ The territory occupied by a pair of birds was frequently so large that it was easily possible to lose trace of both male and female completely, when they dashed off through the thickets, and to be unable to find them again for hours.

We found the birds most common at the edges of the woodlands, in clearings near the railway track, and in the bushy margins of burned-over areas. As a rule but one pair of birds lived in a given patch of spruces or tamaracks; but sometimes two or three pairs inhabited the same narrow tongue of forest.

By June 7, we had at least thirty pairs more or less definitely located in an area of five square miles; we had not, however, witnessed a single action indicative of nest building. The fact that Mr. Taverner had found well-developed young in the nest on June 27, in 1930, disturbed us considerably. Allowing a possible fourteen days for incubation, another four or five for deposition of the eggs, and so on, we calculated that by June 7 the birds ought, at least, to be building their nests. Mr. Lloyd, who had assisted Mr. Taverner during the preceding spring, allayed our anxiety somewhat by assuring us that the season of 1931 was decidedly backward, much later than that of 1930, and that the birds probably had not yet started their nesting.

We continued to collect specimens sparingly, so as to observe the condition of the reproductive organs. A male collected on June 9, and a male and two females taken on June 11, obviously all were mated birds; and yet the ovaries of the females were not noticeably swollen, nor was there a hint of such bareness on the belly as attends the period of incubation. We watched certain pairs by the hour, and found them so amazingly noncommittal about what we supposed to be their "territory" that we began to wonder whether we were anywhere near the actual nesting grounds. The birds would feed together for long periods in the morning, working along among the moss and grass; kicking vigorously, like Fox Sparrows, through leaves and debris; then mount the low bushes, wipe their bills quickly, and fly to some far-distant part of the woodlands, where it was often impossible to find them. Sometimes, indeed, they became mildly excited at our presence; whereupon they would begin *weenk-ing* loudly; but they usually soon lost interest, wiped their bills, shook themselves, and dashed off, leaving us to wonder where their

nest could be.¹ Frequently we found them feeding in tamarack trees; they appeared to be eating the buds. They were very graceful in their movements, climbing about on the slender, outermost twigs, and bowing this way and that like crossbills. Sometimes a single bird would fly suddenly from the ground under a bush, as if it had just come from a nest. Such a bird usually sought a rather high perch, often the top of a dead spruce near-by, where it would give itself over to a spasm of alarm notes, loud enough to summon all the yammering Lesser Yellow-legs from miles around; then it would dart away, to be seen no more. The habit of the birds, when frightened from the ground, of flying to rather high perches was characteristic.²

By mid-June, all the birds we observed in the woodlands appeared to be mated.³ At this season the males so frequently sang in a chorus that it was sometimes difficult to separate a single song from the medley which sounded through the woods. The song most frequently heard was a single, whistled note, tenuous, fragile, a trifle quavering, and possessed of the plaintive character of the final, *Peabody* phrases of the White-throated Sparrow's lay. Sometimes this note was repeated once, twice, even four or five times, the notes trailing into each other uncertainly. Other songs were more elaborate, and consisted of two notes at one pitch followed by two or three notes two steps higher, or two or three steps lower. Often the notes struck were not quite in key, this frequently being responsible, no doubt, for the minor effect the songs produced. The songs of several birds were sometimes so strikingly identical in pitch that a distant song sounded precisely like the echo of another song heard closer at hand.

In the morning, usually between eight and ten o'clock, and in the

¹ Mr. Taverner, in a letter addressed to the junior author, and dated Aug. 3, 1931, states, concerning the behavior of the birds during the summer of 1930: "We found them most aggravating birds. I personally watched pairs for many hours in the aggregate only in every case to have them suddenly vacate the neighborhood entirely and apparently permanently without giving any indication of the position of the nest."

² Mrs. Margaret M. Nice (*The Condor*, Vol. XXXI, p. 57) has referred to this habit, as she observed it in Oklahoma. In her own words "like Tree Sparrows [they] fly up, instead of diving into depths of cover as Song and Lincoln Sparrows do."

³ As late as June 11, 13, and 15, solitary, apparently unmated birds were observed in patches of willow, or among the bare rocks, on the Barren-Grounds.

late afternoon or evening, when the weather was fine, all the birds sang together for long periods. Sometimes, indeed, the chorus continued practically all day long. During the regular song periods the performers often gave their songs with such regularity that two or three birds, singing at different pitches, sometimes produced simple tunes which were repeated again and again, unless some disturbance caused one of the singers to stop. One such tune, which the junior author heard and recognized instantly as part of the theme of a familiar classical composition, was produced by at least two and possibly three birds. It was repeated, almost flawlessly, about twenty times.¹



Since we hesitated to collect birds whose nests we hoped to find later, we did not shoot any singing birds in an attempt to learn whether the female ever sings. Many times, however, we gained the impression that mated birds were singing to each other. One such case we noted on June 8. We were watching two birds which we assumed to be mates and which were feeding in a tamarack; one of them was smaller than the other, and the two seemed to be attached to each other. Suddenly feeding stopped and both began to sing, one in a lower, gentler voice than the other.

Harris's Sparrow has another, louder, and very striking song which we heard only occasionally. This song was so distinctly

¹ Hearing this familiar tune in the woods under such unusual circumstances so surprised and delighted me that I jotted it down as best I could and whistled it every day until I got home. There I enlisted the help of my mother, Mrs. Lola Miksch Sutton, who soon found, in her musical library, the composition we were seeking. The above tune is almost precisely the first four measures of Schubert's *Minuet from the Sonata in G*, Opus 78, No. 3, save for the omission from the birds' performance of the very first note of the composition. The hiatus is filled, in the above score, by a quarter rest. The *Minuet* is an *allegro moderato* movement, whereas the birds sang it more as a *largo*. The first five notes of the above tune were not definitely in key; they were just a trifle high, perhaps a quarter-step off, for the Schubert composition.

The remarkable feature of this performance is, of course, that, though produced by two or three different birds, supposedly singing independently and at different pitches (like belled horses at the circus), it kept so nearly true to a recognizable key note according to our diatonic scale.—G. M. S.

different from the usual whistle, and so suggestive of songs of some of the other species of sparrows, that for some time we could not place it. It began with a fine, swiftly descending, rather tuneless whistle or squeal, and closed with a series of from three to six rough, buzzing, drawled notes which decidedly resembled the usual song of the Clay-colored Sparrow (*Spizella pallida*). We wrote the song down thus: Eeeeeeeeee, zhee, zhee, zhee, zhee, zhee. We noticed that the bird usually gave this song from a high perch and that, after it had sung, it dropped to the ground stealthily or flew off hurriedly.

The alarm note was a loud *weenk*, or *wink*, readily distinguishable from the weaker *zheek* of Gambel's Sparrow and from the heavy *tchup* of the Fox Sparrow (*Passerella i. iliaca*). The call which accompanied mating was a fine, rolling chatter, similar to that given at such time by many other members of the sparrow tribe.

On June 15, a bird carrying a wisp of dry grass was observed to go to the ground somewhere near the base of a large spruce stump in a grove of live spruce trees which grew near a small lake and on rather high ground. Though a prolonged search was made, the nest was not found. We were torn, that evening, between high enthusiasm and frank exasperation, for we knew that there must be a nest somewhere in the vicinity and we also knew we had not found it!

On the next day, June 16, in another part of the forest, a nest with four slightly incubated eggs was discovered (No. 1). The circumstances of the finding were these: After watching a certain pair of birds for a time, the junior author started across a wet, open spruce woods, bound for an area a mile distant which the birds were known to frequent. Just as he entered a clump of comparatively tall spruce trees, he noticed a Harris's Sparrow picking at its belly with its beak, as if it had just come from a nest. He watched the bird for a time without moving, and then deliberately and quietly retraced his steps, marking the spot carefully. After about fifteen minutes he returned briskly, walked noisily through the water, the mossy mounds, and bushes, and, just as he was about to set foot upon the crest of one of the water-bound hummocks—he flushed the bird. The nest was less than twelve inches from his foot. The bird flew directly from the nest, without any attempt at feigning injury;

it perched on a dead spruce bough about twenty yards away, where it wiped its bill. It gave no alarm note. The bird, a female, was collected at once, to make identification certain.

The nest, like that found by Ernest Thompson Seton,¹ was lined with grass, and in appearance and location resembled that of a White-throated Sparrow. It was placed a little to the southward of the top of a mossy, shrub-covered, water-girt mound in a cool, shadowy spot, about thirty yards from the edge of a clump of rather tall spruce trees. It was about thirteen inches above the brown water which surrounded the mound. The foundation material was largely moss, with a few leaves, slender weed stalks, and grasses; the lining was entirely of grass. The cup was $1\frac{3}{4}$ inches deep and $2\frac{3}{4}$ inches in diameter, as measured in the field. The walls were rather thin, for the moss into which the nest was built was very deep and soft. The eggs were sheltered from above by a few sprigs of Narrow-leaved Labrador Tea (*Ledum palustre angustifolium* Hooker)² which were then in bud. The male bird was not seen. The clump of trees where this nest was found was in the forest about two miles back from the edge of the Barren Grounds; the woods were open, however, and the mossy, grassy spaces between the patches of trees had much the appearance of tundra.

On the night of June 18, the entire Churchill region was swept by a terrific windstorm from the northeast, accompanied first by rain and then by snow. In the morning we found the ground covered with six inches of snow which had drifted badly in some places. Lapland Longspur, Tree Sparrow, and Semipalmated Sandpiper nests which we had been watching were completely buried, though incubating Horned Larks and Semipalmated Plovers were found sitting on their eggs in holes in the snow several inches deep! This storm must have worked considerable havoc with the Harris's Sparrows, for even in the sheltered woodlands the snow was deep and considerably drifted.

On June 20, however, we found a nest (No. 2), with four eggs, which had weathered the storm successfully. This nest was almost certainly built by the bird which had been seen on June 15 with

¹ 1908, *The Auk*, Vol. XXV, p. 72.

² For the identification of the flowering shrubs mentioned in this paper we are indebted to Dr. O. E. Jennings of the Carnegie Museum.

nesting material in its beak, for it was situated only about fifteen feet from the spot where the bird had been seen to go to the ground. It was placed at the base of a small clump of shrubs, between two small mounds of moss, not far from a stream, at the edge of a burned-over area. It was constructed entirely of grass, was situated upon a slope with southern exposure, and was sheltered from above by a few twigs. The incubating female flushed at a distance of about ten feet. The female, and the male which was singing near-by, were collected. One member of the party guarded the nest for hours while another returned to camp (at least six miles away) for the camera. The eggs were quite fresh.

On June 26, we made our first trip to the west of the river. Here, in the irregular stands of spruce on the hillsides about a mile back from the river, and especially in the open forest about two miles inland from the shore of Button's Bay, the birds were, at least locally, downright abundant. Every suitable patch of spruce harbored one or more pairs. Alarm notes or songs sounded almost constantly as we walked through the woods. The area which appeared to be best suited to the needs of the birds was the damp, rather sheltered woodland, just at the foot of a rocky hill about six miles west of the river and about two miles inland from the shore of Button's Bay. On this date four nests were found.

The first of these (nest No. 3) held five fresh eggs. It was prettily situated at the edge of a patch of stunted spruce trees on a hillside, under a clump of flowering Alpine Bearberry, *Arctostaphylos alpina* (Linnaeus) Sprengel. The bird was first seen not far from the nest, perched on a low dead spruce, whence she called in an agitated manner. The nest was located some time later by walking noisily through the same part of the thicket; the bird flushed at the loud sound of the breaking of a heavy stub. The nest was well hidden under the shrubs; it was made entirely of grass. The female was collected.

Another nest (No. 4), containing four fresh eggs, was situated at the base of a dead spruce, the lower boughs of which concealed it. Though numerous living spruces stood in the vicinity it was placed more or less in the open. It was found by flushing the female bird, at a distance of about five feet. She at once set up a loud clamor. She was collected, and in her oviduct was found an almost com-

pletely formed egg, indicating that this set would probably have had five eggs when complete. A small egg, probably that of a Gambel's Sparrow, was found on the moss not far from the nest. The male of this pair, as well as the female, was collected.

Nest No. 5, containing three eggs, was situated at the foot of a large rock over which lay a large dead spruce branch; it was built of grass. The eggs were so heavily incubated that they were difficult to prepare. The fact that this, the smallest set thus far taken, had obviously been laid earlier in the season than the others surprised us. It is interesting to note that in nests of the Horned Lark found about this time, sets of three eggs were invariably well incubated, even at the point of hatching, whereas sets of four were fresh. This we believe was not altogether a coincidence; it would appear that the birds which began their mating activities earlier in the season laid a smaller set of eggs, either because they sensed that the food supply might be inadequate for a larger brood, or because temperature, or food supply, or some other factor influenced the procreative urge in the parent birds.

Nest No. 6 was situated at the base of small, dead spruce, on the southern exposure of a mossy hummock, in rather open spruce and tamarack woods, about twenty yards from a small, tree-trimmed lake. It was made entirely of grass, and was sheltered from above by a few sprigs of Labrador tea. The set of four eggs was interesting in that one, which was noticeably smaller than the others, had the general appearance of a Gambel's Sparrow's egg. The male bird had sounded the alarm some time before the female, which was collected, flew from the nest. She flushed almost underfoot.

On June 29, at Mosquito Point, on the western bank of the river, and about nine miles inland from the mouth, we did not see many Harris's Sparrows, though some of the country appeared to be well suited to their needs.

Nests Nos. 7 and 8 were found on July 1, in the Landing Lake district, about nine miles south of Churchill. These nests were constructed and situated similarly to the others, and contained, respectively, three and four eggs, all considerably incubated. Both nests were discovered by flushing incubating birds. As the season advanced the females sat much more closely.

Since we were especially eager to secure some photographs of the

adult bird at the nest, Mr. Pettingill, on July 3, erected a blind near one of these nests. He remained in the blind for two hours, but the female did not return; she flew from tamarack to tamarack in an excited manner, but uttered no sound. The male did not appear, though a singing bird was heard about a hundred yards away. On July 4 this nest was apparently deserted. Mr. Pettingill then moved the blind to the second of the two nests found on July 1. Unfortunately the weather turned cold and stormy, and the birds deserted this nest also; on July 9, the nest was found to be water-soaked, and the eggs, though pipped, were stone cold.

In the meantime, on July 3, a nest (No. 9) with five fresh eggs was found not far from the place where the first nest had been discovered. This probably was the nest of a pair of birds which had lost their first set of eggs in the storm of June 18. The nest was situated under a clump of Labrador tea in full bloom at the edge of an old burning, near a handsome stand of spruces which stood in the shallow valley of a small, poorly defined, muskeg stream. The female bird flushed almost underfoot, flew directly to the top of a spruce near by, and began *weenking* loudly. She was joined almost immediately by the male, and then by another pair of Harris's Sparrows, several Lesser Yellow-legs, a Black-poll Warbler, and a pair of Gray-cheeked Thrushes. She was watched for fully half an hour after she had left the nest. After her first tirade of *weenking* was over, she flew off through the woods, fell to feeding, and after about ten minutes returned to continue her alarum. She did not go back to her eggs, though the distance at which she was being watched from across the burning was considerable.

On July 6, the authors left Churchill, while Mr. Lloyd and Mr. Pettingill remained a week longer, to collect additional material and to take photographs. On July 9 a nest (No. 10) containing three half-grown birds and one addled egg was found. An all day attempt was made to get a photograph, but the birds were exceedingly wary and no good results were obtained. During the following night the young birds disappeared, probably victims of an Arctic fox or weasel.

Mr. Pettingill's notes concerning his experiences in the blind are of interest. They read, in part: "I set up my blind five feet away from the nest and attempted to make photographs. Lloyd remained

in the vicinity until I was prepared to photograph and then departed. The birds continued to "wink," one *continuously*, during my presence. After 1½ hours one of the birds sang for a while a short distance away and returned suddenly to continue with the racket.

"For three hours I remained in the blind. I could see no indication throughout my stay that either parent would approach the nest. Both birds passed from one tree to another around the blind, making this circling a continuous performance. Not once did they drop to the ground nor come any nearer than this particular circle of trees. During the last hour I remained in the blind, the birds were as excited as they were the first hour. Had I been standing there without a blind they probably would have been no more alarmed. I feel sure that if I had left the blind near the nest the birds would have deserted."

Food of Harris's Sparrow on its Nesting Ground.

The Harris's Sparrow is primarily a ground feeder. It kicks and scratches energetically among the fallen leaves and dry weed-stalks, and works its way through the grass and moss searching carefully for seeds and insects as it goes. We rarely saw the birds feeding for a very long period anywhere above the ground. They were sometimes seen in tamarack trees, however, where they appeared to be finding some sort of insect, or perhaps insect eggs, in the clusters of leaves.

We preserved the stomachs of several of the specimens collected, and six of these have been examined by the Bureau of the Biological Survey of the U. S. Department of Agriculture. According to the report given to us by Mr. Clarence Cottam of his identification of material found, the birds consume considerably more vegetable matter (about 66%) than animal matter. Among the vegetable matter found were seeds of various grasses, sedges and bulrushes; seeds or fruit-pulp of the curlew-berry, cranberry or an allied form, and the blueberry; seeds of birch, pigweed, and lamb's quarters; and a considerable quantity of oats which doubtless had been found by the birds along the railway tracks.

Among the animal matter found were remains of numerous insects, both in adult and larval stages—ground-beetles, leaf-eating

beetles, wood-borers, click-beetles, leaf-miners, stink-bugs, small moths, horse-flies, ants, ichneumon-flies, crickets and other forms; several small spiders; and fragments of small snails and other mollusks.

Since certain of our readers may be interested in a detailed account of Mr. Cottam's findings, we present his report in its entirety here:

Stomach Contents of six Harris's Sparrows collected at Churchill, Manitoba during May and June, 1931.

1. Stomach one-third full. Food material 45 per cent; gravel, etc., 55.

Percentage of animal matter, 9; of vegetable, 91.

Contents: Shell frag, of bivalve = 5%; frag. of 1 Formicidae = 1%; frag. of undetermined Coleoptera = 1%; mandibles of 1 Acrididae = 2%; frag. of Poaceae seeds = 1%; 1 seed of *Scirpus* sp. = 3%; seed frag. of about 20 *Carex* sp. = 50%; seed coating and undetermined plant fiber = 37%.

2. Stomach full. Food material 99 per cent; gravel, etc., 1.

Percentage of animal matter, 24; of vegetable, 76.

Contents: Frag. of 1 Chrysomelidae, = 1%; frag. of 1 Buprestidae = 1%; frag. of Hemiptera = trace; frag. of 1 Lepidopterous larva = 1%; frag. of 1 Diptera = 1%; frag. of 1 Vespoidea = 5%; frag. of 1 Myrmicinae = 1%; frag. of 5 Formica sp. = 5%; frag. of 3 undetermined Formicidae = 5%; frag. of 3 undetermined Hymenoptera = 3%; spider frag. = 1%; Mollusk frag. = trace; frag. of 4 seeds of *Empetrum nigrum* = 4%; 61 seeds *Cyperus* sp. = 60%; 16 seeds of Ericaceae = 3%; 12 seeds = 1%; 4 seeds of *Vaccinium* sp. = 1%; undetermined plant fiber = 7%.

3. Stomach full. Food material 99 per cent; gravel, etc., 1.

Percentage of animal matter, 73; of vegetable, 27.

Contents: Fragments of 22 Elateridae = 50%; frag. of 1 larva of Elateridae = 1%; frag. of 1 large Curculionidae = 3%; frag. of Heteroptera = trace; frag. of undetermined Diptera and about 500 eggs = 8%; frag. of Lepidopterous larvae = 1%; frag. of 2 *Formica* sp. = 1%; frag. of 13 *Myrmica* sp. = 5%; frag. of 1 Ichneumonidae = 1%; frag. of 1 Alsyyidae = trace; spider fragments = 3%; frag. of bivalve, = trace; 1 seed of *Amaranthus* sp. = trace; 2 seeds of *Carex* sp. = 1%; frag. of 1 seed of *Vaccinium* sp. = trace; 4 seeds of *Empetrum nigrum* = 2%; 2 seeds and fruit pulp of *Arctostaphylos wa-ursi* = 1%; undetermined fruit pulp = 16%; 125 seeds of Ericaceae = 7%.

4. Stomach full. Food material 92 per cent; gravel, etc. 8.

Percentage of animal matter, 80; of vegetable, 20.

Contents: Fragments of 6 *Cryobius* sp. and 1 other Carabidae = 15%; frag. of 2 *Cercyon* sp. = 1%; frag. of 1 Chrysomelidae = 2%; frag. of un-

determined Coleoptera = 2%; frag. of 2 Coleopterous larvae = 7%; frag. of 1? Pentatomidae = 1%; frag. of 4 large Noctuidae larvae = 33%; frag. of 2 undetermined Lepidopterous larvae = 5%; frag. of 1 larvae of *Chrysops* sp. (Tabanidae) = 1%; frag. of Gastropod = 1%; frag. of undetermined Hymenoptera = trace; frag. of 3 spiders of which one was Attidae = 12%; 2 seeds of *Carex* sp. = 1%; 2 seeds of *Cyperus* sp. = trace; frag. of 1 seed of *Betula* sp. = 1%; frag. of 1 seed of *Empetrum nigrum* = 1%; finely broken up seed frag. of what appeared to be *Arctostaphylos* sp = 7%; seeds, frag. of glume of Poaceae = 1%; 12 seeds held = 5%; 22 unidentified seeds held = 4%.

5. Stomach two-thirds full. Food material 60 per cent; gravel, etc. 40.

Percentage of animal matter, 10; of vegetable, 90.

Contents: Fragments of 1 Curculionidae and other Coleopterous fragments = 5%; frag. of 3 *Formica* sp. = 5%; frag. of 3 seeds of *Arctostaphylos wa-ursi* = 7%; 7 seeds of *Empetrum nigrum* = 5%; frag. of 2 seeds *Cyperus* sp. = 1%; frag. of about 48 seeds of *Carex* (near *rostrata*) = 50%; 2 seeds of *Carex* sp. = 1%; frag. of 2 seeds of *Chenopodium* sp. = 1%; undetermined plant fiber = 25%.

6. Stomach three-fifths full. Food material 50 per cent; gravel, etc., 50.

Percentage of animal matter, 3; of vegetable, 97.

Contents: Frag. of Coleoptera = 1%; undetermined insect fragment = trace; frag. of mollusk = 2%; frag. of 4 seed coats of undetermined composite = 5; frag. of seed coats of *Avena sativa* = 89%; undetermined plant fiber = 3%.

Eggs.

The series of twenty-nine eggs collected shows considerable variation in size and shape, and in the arrangement of the markings, but not in color. On the whole, the eggs are *ovate* in shape, though they are a trifle slender for the 100 x 68 mm. requirement for this class, and not slender enough for the 100 x 55 mm. requirement for the *elongate ovate* class. Some of the eggs are decidedly rounded, others long and narrowed. In each of three sets (two sets of four and one of three eggs, perhaps laid by young females) one egg is small enough to be considered a runt.

The average size of twenty-six Harris's Sparrow eggs (the three above-mentioned runt eggs not included) is .94 x .65 inches. They are, accordingly, larger than eggs of either the White-crowned or White-throated Sparrow, though not of the Fox Sparrow. Ridgway gives the measurements of the Fox Sparrow's egg as .91 x .63 inches; Coues, as .95 x .70; Forbush, as .85 to .94 x .63 to .71; Brewer, as .92 x .70; and Chapman, as .80 x .63 (cf. Bendire).

The Harris's Sparrow is assuredly a longer bird than the Fox Sparrow, but it is more slender, and its greater length is, perhaps, chiefly due to the greater length of the rectrices.

The ground color of the Harris's Sparrow eggs, virtually throughout the series, is *pale glaucous green*.¹ The markings, which vary somewhat in intensity, but not in *hue*, take the form of splotches, spots and scrawls, sometimes in a sort of irregular wreath about the larger end, but more often generally distributed over the whole. The markings are of varying degrees of intensity of *pecan brown*.

Measurements in inches of Harris's Sparrow Eggs.

Nest No.	Egg No. 1	Egg No. 2	Egg No. 3	Egg No. 4	Egg No. 5
1	.94 x .66	.90 x .65	.93 x .66	.92 x .65	
2	.86 x .66	.94 x .67	.95 x .65	1.02 x .64	
3	.95 x .68	.94 x .65	.96 x .65	1.00 x .64	.94 x .65
4	.93 x .65	.95 x .64	.93 x .65	.93 x .59*	
5	.91 x .64	.93 x .65	.84 x .62*		
6	.91 x .67	.92 x .66	.89 x .65	.79 x .60*	
9	.94 x .63	.97 x .65	.99 x .63	.95 x .63	.98 x .64

* These somewhat undersized eggs we have considered runts and have not included them in the averages.

Summary.

The spring season of 1931 was later than that of 1930, and it was probably later than usual. The Harris's Sparrows returned to Churchill from the south on May 27 in 1931, the males in full song, and some of the birds apparently mated. Nest building on the whole did not begin before the end of the first week of June, the first nest, discovered on June 16, containing four slightly incubated eggs. Of the nine sets found, five were of four eggs, two were of five eggs, and two were of three eggs; and one nest was found containing three young and an addled egg. The nests were built chiefly of grass, with a lining of finer grass (no hair, feathers, or plant down of any sort) and were situated usually in mossy hummocks among the stunted spruce trees, often on a small "island," under some sort of low shrub, and on a sheltered, southern exposure. The female only was found to incubate. Early in the season the birds, both males

¹ Underlined words in this description are from Ridgway's *Color Standards and Nomenclature*.

and females, showed but little attachment to the nests; later, however, females which had been flushed usually returned to their eggs within half an hour. But one brood is reared during a season; nests found with fresh eggs in late June or early July had probably been built after the destruction of earlier nests by the savage blizzard of June 18. The female was found to incubate closely, flushing only on near approach; in leaving the nest she flew up to a spruce-top or other relatively high perch, without any attempt at feigning injury.

Sewickley, Pennsylvania.