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THE EUROPEAN STARLING IN GASPÉ

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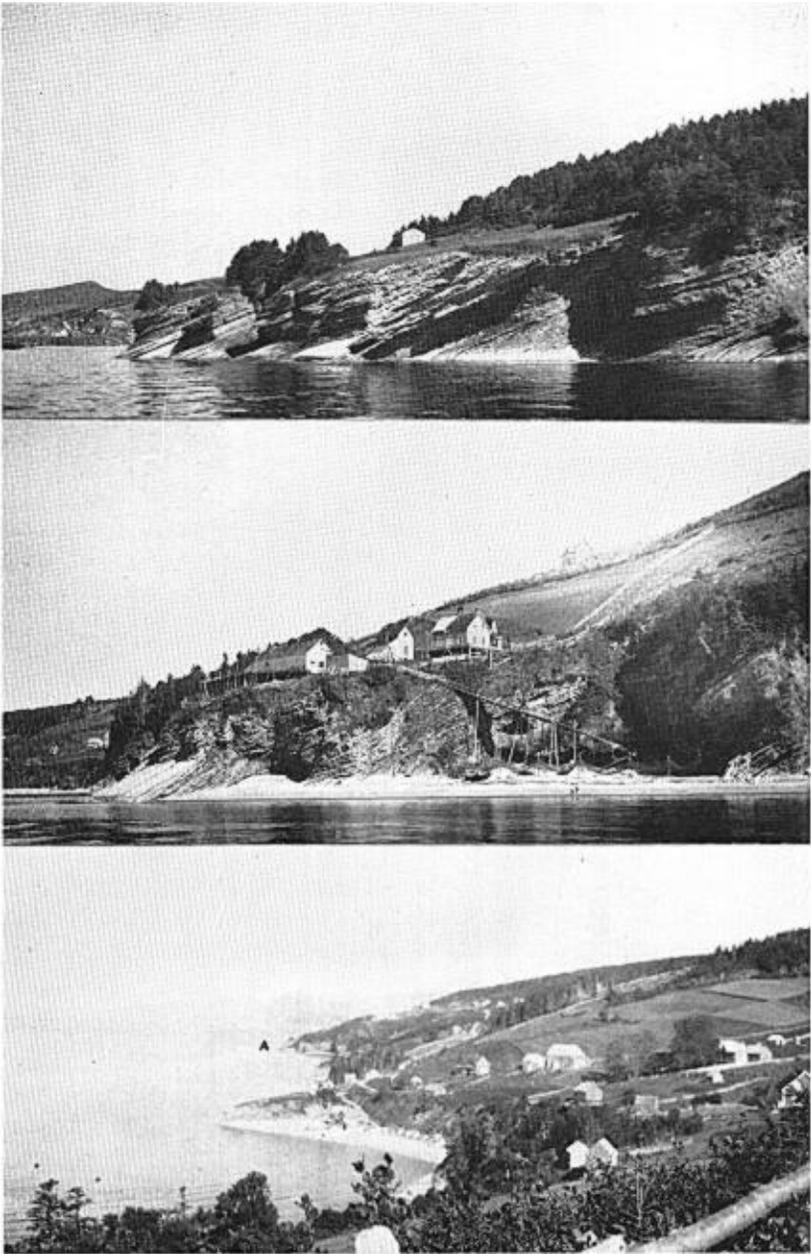
Plates 6, 7

IN its radiation from New York City where it was established in 1890, the European Starling (*Sturnus vulgaris* Linn.) was first recorded in Canada at Halifax, Nova Scotia, on December 1, 1915 (Tufts, 1926), and in southern Labrador in the spring of 1917 (Lewis, 1922: 513). For its early history in Ontario, the reader is referred to the excellent account by Dr. Harrison F. Lewis (1927). He has since followed the spread of this pioneer through Ontario, Quebec, and

Labrador (1930, 1931, 1933, 1934, 1935, 1941). On the southern shore of the Gaspé Peninsula he first recorded it at Oak Bay Mills on November 13, 1930, at Percé in 1932, and at Betchewun and Natashquan on the north shore of the St. Lawrence Gulf in 1933. To the westward he found a flock of seven at Moose Factory on the west shore of St. James Bay, Ontario, October 11, 1931. On September 22, 1941, he saw two Starlings at Albany, north of Moose Factory.

Not until 1940 was the Starling observed on the island of Anticosti (Lewis, 1941: 79). I have found no records from Newfoundland. This lack is consistent with the dispersal paths traced by Lewis (1927). The birds, having spread through Ontario, could be expected to push eastward north of the St. Lawrence through the suitable cleared land along the coast. Doubtless they have reached Gaspé by the southern St. Lawrence shore, as well as through New Brunswick.

In Grande Grève, on the north shore of the Bay of Gaspé, lives a bird observer, Mr. P. S. Hotton, who as a youth on the Isle of Jersey knew the Starling well. At the time of my first visit to Grande Grève, August 20-28, 1935, none of these birds had been seen, but upon my return in June, 1936, several pairs were found nesting. Mr. Hotton informed me that a few Starlings had appeared about his home for the first time in October, 1935. From Mr. Fred Richmond of Gaspé Basin it was learned that this species appeared there in 1932. A pair nested in the ceiling of his veranda, entering a lozenge-shaped hole left for ventilation. This Gaspé record of 1932 adds interest to Lewis's observation (1934: 88), May 12, 1932, of a flock of six at Percé, 41 miles southeast of Gaspé Basin, and visible from the hills behind Grande Grève. This may have been their first season in Percé as well as in Gaspé Basin. Their failure to reach Grande Grève until four years later, and to nest there until 1936, is the more remarkable in the light of another observation made by Lewis (1934: 89). On May 9, 1933, he saw three Starlings on Grindstone Island, one of the Magdalen Islands near the center of the Gulf of St. Lawrence. They must have crossed at least 55 miles of water to reach the Magdalens if they came from either Prince Edward or Cape Breton islands. From New Brunswick or Percé the distance is about 130 miles, somewhat less from Anticosti and Newfoundland on the north and east, respectively. I have found no records of Starlings on the latter, but on September 24, 1932, Lewis (1934: 89) saw a flock of 18 at Pownal, Queens County, Prince Edward Island. It may have comprised three or four families that had bred there in 1932. Several questions at once arise. Was this their first year on



(Upper) CLIFFS AT ST. AUGUSTINE (A IN LOWER FIGURE). (Middle) BOULET'S CLIFFS AND FISHING STAGE. (Lower) VIEW ALONG SHORE OF THE FORILLON; INDIAN COVE IN FOREGROUND.

the island? Did some or all of them winter there? Did some of them push on to the Magdalens the following spring?

Studies of the Starling in 1936 at Grande Grève and along the rest of the north shore of the bay revealed an interesting adaptation to local conditions. The birds' well-known predilection for cavities had led them to choose as nesting sites cavities in the shore cliffs in close proximity to Black Guillemots (*Cephus g. grylle*). The limestone strata that compose the Forillon have been eroded by wave action in such a way as to leave along the Gaspé Bay shore a line of cliffs averaging about 20 feet in height (Plate 6). In some places, as at Grande Grève (Plate 7), they reach 40 feet, in others not more than ten feet. At various intervals these cliffs have been broken down so as to form gravelly beaches seldom accessible from above except by ladders (Plate 6, middle fig.). Of the entire five-mile shore from Little Gaspé to Cape Gaspé, perhaps three miles of cliffs exceed a height of ten feet above high-tide mark. But by no means all of this length is suitable for Starlings, partly because the erosion has not throughout led to the formation of cavities—mere niches are insufficient—and partly because of too great activity by fishermen around the many little beaches that dot the shore wherever wave action has piled a little gravel and cobble into a tiny cove large enough to haul a boat. Other parts of the cliffs, well provided with cavities and undisturbed, are probably unattractive because too far from good feeding grounds. At Cape Gaspé, and again east of Indian Cove, woodland extends for some distance up the slope above the cliffs. At the cape this is fast being cut off and the land placed under cultivation. It will be interesting to learn whether Starlings will nest in these terminal cliffs within the next few years as the environment improves.

William H. Hudson, in 'British Birds' (1895: 155), writes of the Starling: "a hole in a tree or rock, in a cliff or quarry, suits him very well." Probably in few localities in America has this bird become so consistent a cliff dweller as in Gaspé.

In 1936, three pairs occupied crevices at Grande Grève, two pairs at St. George's Cove, and two pairs near St. Augustine Church, half way down the Forillon (Plate 6, upper fig.), the most easterly point used that season. Some of these nests occupied holes not more than 12 feet above high-tide mark. During storms, spray dashed almost to the openings. Apparently the continuous noise of surf breaking against the rocks never bothered these sturdy birds. Nor was there any evident antagonism between Starlings and Guillemots. I hope

some year to reach Gaspé early enough in the spring to observe the selecting of nest sites. Perhaps some competition may then be detected. The likelihood is small, for there are numerous cracks and niches in these cliffs. Furthermore, the majority of the Guillemots, of which Grande Grève has about forty pairs, occupy holes in the lower half of the cliffs, while most of the Starlings select the higher ones.

The farmer-fishermen have left at the top of the cliffs a fringe of trees, mostly spruces, birches, and pin cherries (Plate 7). The Starlings perch frequently in the spruces above their nests, and the males occupy their 'singing trees' during many sunny hours. And upon these trees they often alight on their journeys with food for the nestlings.

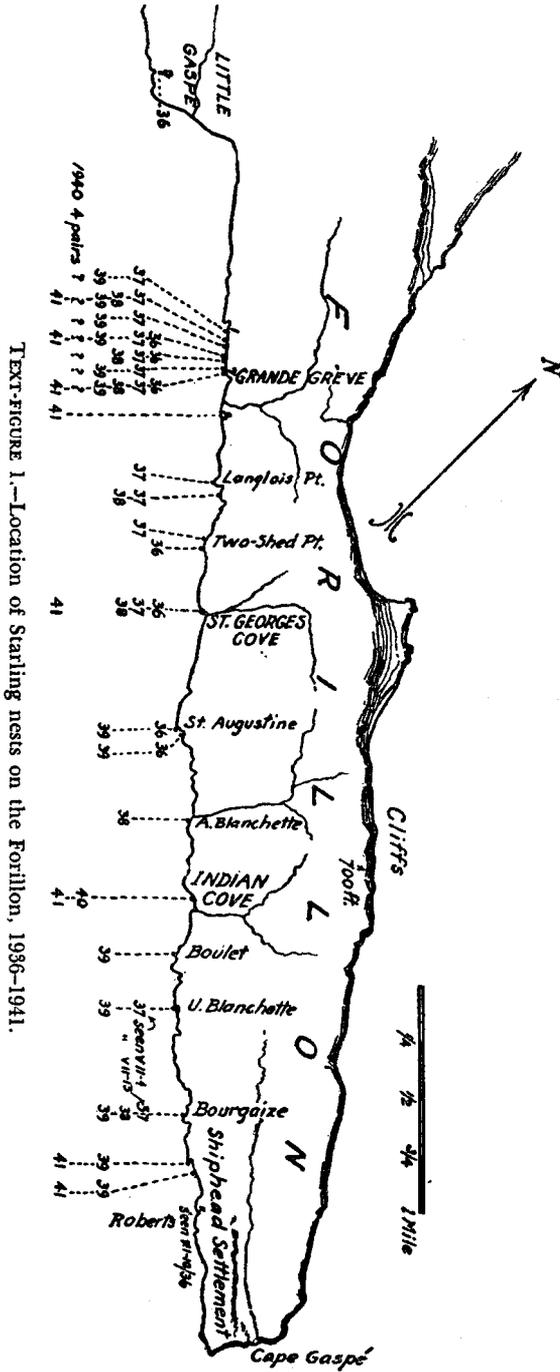
Feeding territories are not defended by these Starlings. On the steep, sloping fields, gardens, and pastures that extend upward from the shore cliffs (Plate 6, middle fig.) the adults obtain food wherever they can find it, sometimes within 50 feet of the nest, often from sources a quarter of a mile distant. Several pairs search amicably side by side. For days they may glean dipterous larvae from fish heads that have been scattered as fertilizer upon some field. At another time a particular house garden yields insect food, spiders, slugs, and perhaps earthworms. Again, a circumscribed area in a field of grass, so tall as to hide the birds completely, attracts the adults in their search for food to satisfy their young during the last week of nest life. The various pairs thence follow divergent lines to their respective cliff dwellings.

DISTRIBUTION

During the years 1936-1941, nesting Starlings have been found on both the northeast and southwest shores of Gaspé Bay, and for short distances up the three rivers that enter it, the Dartmouth, York, and St. John. But, true to their habits throughout their known range, none has been found far from man's cleared fields; none has entered the forests.

Curiously enough, the Starling population is greater along the Forillon and the rest of the north shore through Cap-aux-Os, Rose-bridge, and St. Marjorique than along the southerly border of the Bay. Cultivation is the same on both sides; cliffs also are common to both. Perhaps, although no comparative temperature data are available, the southerly slope of the north-shore fields exerts an influence on the birds' choice.

Another variable is the nature of the cliffs. Whereas sandstone enters into the constitution of cliffs west of Little Gaspé, at Cap-aux-Os, St. Marjorique, and along a part of the south shore, those



TEXT-FIGURE 1.—Location of Starling nests on the Forillon, 1936-1941.

of Grand Grève and the rest of the Forillon consist wholly of hard limestone. This rock has more fractures and cavities than the red sandstone, and it is on the Forillon that practically all Starlings nest in the cliffs. It should be emphasized that, conifers prevailing, hollow trees are almost wholly lacking in proximity to the Bay. An occasional cavity in *Betula*, *Sorbus*, and a rare *Acer* may be found in the forests, beyond reach of Starlings.

In 1941, a pair of Starlings nested in the broken roof of a building that almost overhangs the cliff at Grande Grève. This constitutes the first use of a building on the Forillon during their first six years there. In 1943, a pair occupied the chimney of a vacant house at Grande Grève. Farther up the Bay shore, Starlings as a rule chose buildings, probably because few suitable rock crevices occur in such sandstone cliffs as face the Bay at a few points. Indeed, at Little Gaspé just west of the Forillon's base, the only cliff is a low one of Gaspé sandstone. As John M. Clarke (1908) has pointed out in his account of the geology and paleontology of the region, this is the most easterly exposure of red sandstone on the north shore of Gaspé Bay. It is, therefore, no matter of chance that in 1936 the first and only pair of Starlings to nest in Little Gaspé (Text-fig. 1) occupied a hole in the roof of an abandoned house instead of in a cliff, as did their neighbors at Grande Grève, three-quarters of a mile to the east where limestone cavities were available.

It is noteworthy that in 1936, their first breeding season on the Forillon, Starlings reached a point half a mile from the tip; one was reported on Wilson Roberts's barn on June 10 (Text-fig. 1). But this pioneer apparently withdrew, for none nested beyond St. Augustine, about half way down the little peninsula. Here two families were successful. Another bred in a short cliff above the beach at St. George's Cove, and two more within 50 meters of each other a quarter of a mile farther westward in limestone crevices at Two-Shed Point. Near the base of the Forillon, Grande Grève attracted the largest number, three pairs, in this first season. Its popularity has continued, probably for the three following reasons. First, the nesting holes are numerous. Secondly, the largest human population resides here, thus providing an abundance of food in an acceptable habitat. Thirdly, Grande Grève is the first attractive area which the birds encounter as they enter the Forillon from the west.

NESTING DATES

Although in some years I have reached Grande Grève as early as June 14, the Starlings had always begun incubation. Until hatching

time the adults are infrequently seen. This seems extraordinary, in view of the males' noisiness on their territories in New England. But no attempt has been made methodically to record the adults' activities until they have begun feeding the nestlings. They are then conspicuous enough, so that a fairly complete picture of their behavior can be obtained without neglecting other work.

So quiet were the Starlings following my arrival on June 14, 1941, that not one was seen during the first week. Then on the 21st, three pairs suddenly appeared on the roof of a fisherman's house close to the cod-drying 'flakes' on the beach. Four days later, these six birds were busily carrying food from a neighbor's garden to their cliff holes. On the 26th, a fourth pair began feeding young in the roof of a storehouse at the other end of the beach. They were still carrying food into this hole on July 11. No juveniles were noticed until the 16th when one family was perched in a spruce at the top of the Grande Grève cliff. Eleven young reached a tree far up the slope on the 18th, and 22 juveniles and adults were seen there on the 23rd. Four adults and fourteen young were counted on the 27th. Later in the day they left Grande Grève for the season, flying compactly up the Bay toward Little Gaspé.

The 1940 nestings may have been delayed a few days, for upon my belated arrival, July 26, the picture all along the Forillon was of family groups not yet united into the large summer flock. Even as late as August 21, two adults with five juveniles were active at Grande Grève.

The earliest date upon which young are known to have emerged from their cliff dwellings is July 2 (1938, 1941). In 1937 at Grande Grève, and 1939 at Shiphead, the event took place a day later. It is interesting that in 1936, the first year Starlings nested on the Forillon, the earliest emergence of juveniles occurred ten days later, July 13. That it should fall on so nearly the same date in four years out of six is noteworthy. In 1940, I was told that four pairs had nested in the Grande Grève cliffs. But the date of first emergence of young was not recorded. Judging from the presence of a family group at Indian Cove, and another still frequenting Grande Grève, the 1940 season had not differed appreciably as to dates of nesting and dispersal.

No evidence has been obtained that any pair of Starlings in Gaspé has attempted a second nesting in the same season. Nor would second broods be expected. Even in Ohio, where the favorable season is longer, Hicks (1935: 61), after careful banding studies, concludes that 95 per cent of the birds nest successfully but once each year.

BEHAVIOR OF ADULTS AT CLIFF DWELLINGS

Observations from on shore, the fields above it, and from a boat off the shore have established the behavior of adult Starlings about their nests at Grande Grève. I have not reached Gaspé in time to witness nest-building, but the only nest accessible without special equipment was of the usual construction, made up of grasses, flexible strips of bark, leaves, seaweed, and a few feathers from nearby barnyards. This nest was on the floor of a crevice about eight inches wide and seven feet deep, that extended downward almost perpendicularly from the steep slope above (Plate 7, right 5). Shortly after noon, the sun for a brief period sufficiently illuminated the crevice from the cliff face so that the nest could be discerned. Photography was unsuccessful.

From the boat, seven nesting sites in 1937 could be watched at once. It appeared that the members of each pair relieved each other at incubating. Before descending, a bird usually spent some time on its favorite tree at the cliff brink, preening and calling. It then glided down, usually to a point somewhat below the hole, and ascended to the entrance. Without delay it would enter, and almost immediately, with or without comment, a bird hastily would emerge, drop a fecal sac, and ascend to the territorial spruce. This was judged to be the relieved mate, for there was no evidence that food was carried by the arriving bird. Sometimes the emerging bird, without alighting, flew directly to one of its feeding grounds, usually nearby, but not infrequently to a garden a quarter of a mile distant. To reach it the Starling had to pass over, or around, an elevated point of land. I made no attempt to determine the length of individual incubation periods and the feeding intervals.

Even during afternoons when the sun warmed the cliffs, the adults seldom spent a full minute exposed to view at their nesting sites. This is remarkable, especially in the two instances where convenient roosting places existed. Apparently the urge of the returning bird to incubate and that of its relieved mate to exercise and feed were strong enough to preclude any basking on the sunny doorstone.

Hatching speeded the activities of the parents. Seldom thereafter were they to be seen resting on the territorial tree, but shuttling rapidly back and forth between feeding ground and nest hole. Even the momentary stop at their tree was usually omitted; from field, garden, or the 'fish-flakes' where cod was drying, as soon as a mouthful of food could be procured each bird flew as directly as possible to its nest. If the source were at some distance along the shore, the bird

consistently made most of its flight over the water, paralleling the cliffs, sometimes only six feet from them, again fifty feet seaward, now at the level of the cliff top, and again barely missing the heads of the Guillemots on the water's surface.

Rarely was a food-laden Starling seen to take a full stride along the entrance sill; nearly always its feet dropped only as it disappeared within the hole. After three to ten seconds it would burst as suddenly forth, frequently to retrace its route to the last visited feeding ground. But more than once I saw evidence that the bird either recalled another previously used source or was attracted, perhaps by the sight of another bird, to a new feeding area.

BEHAVIOR OF YOUNG

My first visual evidence of the young was their appearance at the mouths of their holes. One instance may be cited. In 1937, nest no. 7 at Grande Grève was hidden behind a piece of rock (Text-fig. 2, *a*) but was provided with a sill extending from *b* to *c*.

On July 8, at 6:30 A. M., two young were seen to emerge from behind this block. First one and then the other approached the edge at *b*. After a few moments both withdrew. At noon the same day, I was fortunate in witnessing what I believe to have been the first flight of a short-tailed juvenile from this nest. The boat was hardly anchored when, at 12:20, the bird quickly walked out from behind *a* to the edge at *b*. After standing a moment, calling twice, it hesitantly sidled along the tiny ledge to *c*, glanced downward, then upward fixedly for about five seconds. Without perceptible initial drop toward the water, it rose on rapidly beating wings to a fallen tree-top that projected over the edge of the cliff twelve feet above. After resting a few moments, the youngster hopped from branch to branch until hidden from view by the bushes. The probability that practice flights preceded this ascent seem ruled out by the environment.

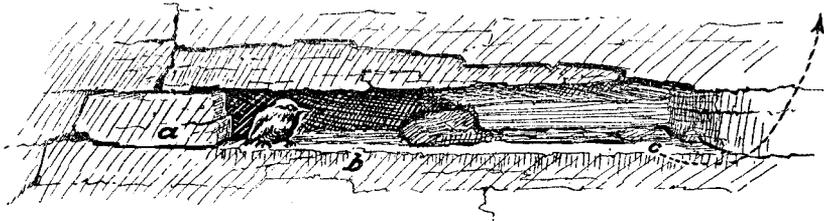
At 12:42, two more young appeared in the vestibule of their home, but had attempted no flight before my departure at 1:00. Had they witnessed their comrade's successful venture, I might have seen the entire brood launched upward. That they, too, attained the cliff top was apparent at 4:20 when the parents were feeding three young in their favorite spruce nearby.

This brood was the second to emerge. On my way down to the boat at 6:15 A. M., I noted two immature Starlings on a spruce at the top of the cliff above nest no. 1 (Text-fig. 1). That they had emerged from this nest was confirmed by total lack of activity at the hole during the day. By July 13, the other five had joined them, and

the combined flock roosted chiefly in the evergreens along the cliff top. During the day they made frequent sallies to feeding grounds or attractive perching places. One such favorite was a dead birch beside a fence far up the slope from their cliff colony. As many as 15 young, frequently accompanied by some of the adults, occasionally visited the coulee behind Grande Grève. That the group was no larger was due to predators (see p. 91).

BEHAVIOR OF THE MIXED FLOCK

At least eleven adults and young were seen together at St. George's Cove on July 13, 1936. The three Grande Grève broods left their nests at about the same time. From July 20 until August 26 a mixed flock of 27 adults and young frequented the countryside between St. George's Cove and Grande Grève. An increment of six—probably the family from Little Gaspé—then brought the total to 33. Appar-



TEXT-FIGURE 2.—Nesting crevice in Grande Grève cliff. Arrow indicates initial flight of juvenile to tree at top of cliff.

ently all left for the west on that day, for none were present on the 27th. But five of them were back on their favorite cliff-spruces on the 28th, and the group had grown to nine the following day. Of course, the identity of these individuals could only be surmised; some may have left, to be replaced by others. None was seen on August 30, my last day in Gaspé.

The 1937 flock remained at Grande Grève until July 22. Doubtless, like all passerine migrants, they then proceeded northwestward up the Bay, for two days later a flock of about 50 fed in the fields at Cap-aux-Os, six miles distant. During the late summer as many as 500 Starlings have been seen together with 300 grackles near St. Marjorique, eleven miles farther up the Bay, where rolling fields can support them. Most of these birds are believed to have come through the mountains from the north shore of the Gaspé Peninsula.

On the 27th, a single adult called and sang for twenty minutes in a spruce grove on top of the ridge, and nine visited our dooryard on August 3. Not another Starling was seen on the Forillon until August

24 when 16 appeared on the upper fields behind Grande Grève. They were feeding westward at 9:30 A. M. along the fences. Only one adult was noted. The immature birds, though considerably spotted, were still brown. Again on September 13, the day of my departure, two Starlings and a flicker perched in a birch tree beside a house.

On November 1, a correspondent at Grande Grève wrote that since October 12, when 23 were seen during a snowstorm, Starlings had been seen almost daily.

FLUCTUATION IN POPULATION AND LOCAL RANGE

It was stated above that in their first breeding season, 1936, seven pairs of Starlings distributed their nests along the basal half of the Forillon (Text-fig. 1). The easternmost sites were in the cliffs below St. Augustine's church where two pairs reared broods. Of the others, two pairs chose short and comparatively low cliffs about a quarter-mile apart at St. George's Cove, while three inhabited the longer, higher ones at Grande Grève. The season on the whole was successful. Every one of the 14 adults survived, and each of the three Grande Grève pairs brought out four young, all of which lived to migrate. At St. George's Cove, the two broods numbered four and three young, and at St. Augustine, four and two. The season's increase on the Forillon was 25, and the population total in August was 39, or nearly three times the number that invaded the little peninsula in the spring.

Of these, the largest number seen together at one time was 33, an accumulation of the Grande Grève population of 18 birds (six adults and 12 young), 11 (four adults and seven young) that had appeared two days before, and six new arrivals (one adult and five young). Their behavior was significant. All were discovered in the early forenoon of August 26, perching quietly upon two partly dead birch trees far up the slope behind one of the Grande Grève houses. Presently all flew down toward the shore, familiar to 18 members of the group as their home, and to 11 others through two days' experience. Without alighting with their mates on the spruces at the edge of the shore cliff, six birds detached themselves from the flock and returned to the trees above the house. One may imagine that they constituted a family group, the increment of the morning from farther down the Forillon.

On the following day none was seen, but on the 28th, five were perched on the favorite spruce above the cliffs, and on the 29th, nine were observed on telephone wires along the road. Later in the day, a group of the same number fed for an hour in a newly-mown field at the west end of Grande Grève. These were the last seen on the

Forillon before my departure a few days later. Doubtless, they had passed on up the shore to augment the flock seen near the head of the Bay.

In a letter written on October 1, 1936, Mr. Franklin Gavey, whom I asked to watch for Starlings, reported as follows for Grande Grève and Little Gaspé during the previous month:

<i>Date</i>	<i>Starlings</i>	<i>Date</i>	<i>Starlings</i>	<i>Date</i>	<i>Starlings</i>
Sept. 1	9	Sept. 11	9	Sept. 21	6
2	3	12	2	22	9
3	15	13	0†	23	9
4	0†	14	24*	24	0†
5	3	15	9	25	18
6	17*	16	2	26	9
7	5	17	0†	27	16*
8	3	18	0†	28	2
9	8	19	4	29	4
10	9	20	2	30	3

* In Little Gaspé

† Stormy

It is evident from this record that some movement back and forth occurs, for the numbers, disregarding stormy days, varied from two to 24. Mr. Gavey made similar observations in the fall of 1937 and in 1938. Remembering that it was during the autumn of 1935 that the first Starlings reached the Forillon, it may safely be concluded that during the period of greatest movement, these birds, like other passerines, frequently passed southeastward into the peninsula and back again to the northwestward. I have witnessed similar behavior in 1939, 1940, and 1941.

In view of the successful initial breeding season, it is not surprising that the number of pairs found nesting in 1937 rose to eleven. As shown in Text-figure 1, Grande Grève again attracted the larger number; seven pairs occupied cliff cavities. Rather surprising was, not alone the failure of these enterprising birds to extend their range farther toward the tip of the Forillon, but even a withdrawal from St. Augustine. The easternmost nest was at St. George's Cove in the same cliff crevice that was occupied in 1936. The next brood to the westward was raised, not in the identical cavity on Two-Shed Point used during the first season, but in another 100 meters up the shore.

Two entirely new holes were chosen near the Langlois farm between Grande Grève and St. George's Cove. Here fish refuse in considerable quantity was available on the beach, and one of the best gardens lay on the steep slope just above. If it be imagined that these two pairs represented the 1936 families at St. Augustine, the population thus far considered may be regarded as the same as that which opened the 1936 season.

The Grande Grève cliffs, however, supported four new nests. Three occupied holes somewhat farther westward; the fourth was among the three which had been used previously.

Only twice during 1937 were Starlings seen east of St. George's Cove, one at Shiphead on July 13, the other on July 4 at Blanchette's landing. Although neither of these established a nest in 1937, the fact that they ranged so far eastward while others were nesting suggests either that they were unmated birds in pioneering rôles, or members of pairs established farther west, and were ranging farther than usual in search of food. It was interesting to find a nest at one of these locations the following season, and at both in 1939.

Owing chiefly to predation by Crows (*Corvus b. brachyrhynchos*), the 1937 breeding season was less fortunate for the Starlings. On three occasions, Crows were observed eating young Starlings, and I saw one Crow enter a nesting cavity in the Grande Grève cliff, emerge with a struggling fledgling, and fly up into a spruce tree where the prey was torn to pieces and devoured. For weeks, eight or ten Crows frequented the trees bordering this cliff. The adult Starlings were unable to drive them away. As a result, not over 15 young out of a reasonable expectation of 28 from seven nests survived to migrate.

Another predator suspected of taking an occasional Starling was a Duck Hawk that dwelt on the Bon Ami cliffs on the north side of the Forillon. More than once it took immature Black Guillemots from the vicinity of their nests in the Grande Grève cliffs.

It would, perhaps, be unwise to suggest that the Crow depredations of 1937 were remembered by Starlings in choosing the nesting cavities the following spring. It is a fact, however, that the holes with large entrances have not harbored broods since 1937, while as many as four of the crow-proof crevices have been used consistently. At the same time it should be stated that Crows were more numerous in July and early August, 1937, than in subsequent years, at least through 1941. By the time of the great fall gatherings of Crows in late August, September, and October, the immature Starlings had left or learned to protect themselves. Indeed, they not infrequently have been seen roosting amicably on the same trees.

The greatest flock of Starlings observed in August, 1937, numbered 16. This included only one adult. The others were regarded as an aggregation of the 15 young that had previously been observed with their parents as they fed in the fields above their respective nest holes. Absence of the other 21 adults on this and the following days suggested that they had already migrated up the Bay shore.

In the spring of 1938, only seven pairs of Starlings nested on the Forillon. As shown in Text-figure 1, only three of the nest holes at Grande Grève were occupied. One pair settled at Langlois Point, and one in the usual crevice at St. George's Cove. This year brought an advance down the peninsula, with a nesting below Alex Blanchette's and another at the western end of Shiphead Settlement in a cliff hole a mile from the tip. The first of these yielded five young, seen with their parents July 15 on a spruce above the cliffs. This family group was joined next day by the pair and their three young that had occupied the Shiphead site.

Twenty-two Starlings seen together July 7 at Grande Grève, and 21 on July 23, constituted the largest groups recorded for the 1938 season on the Forillon. They left the locality on the 29th. No others appeared there until August 9, when a flock of nine passed eastward overhead. But these and other groups numbering from eight to 20 are not to be considered as parts of the 1938 breeding population on the Forillon but rather as autumn migrants.

Referring again to Text-figure 1, it appears that in 1939 thirteen pairs of Starlings nested on the Forillon, two more families than in 1937. The Grande Grève and St. Augustine cliffs were again well occupied. For some reason, no birds settled at Langlois Point, Two-Shed Point, nor St. George's Cove. But four new sites, all in cliffs, were established far down the peninsula. As usual they were chosen in proximity to the cod-dressing and drying stations associated with fishermen's homes, and with their barnyards and gardens. The two nestings recorded at the eastern end of Shiphead settlement extended the local breeding range to within three-fourths of a mile from Cape Gaspé.

Although holes and food are available on the premises of the two easternmost farms, 100 meters from Cape Gaspé, this environment has not as yet proved sufficiently attractive. Curiously enough, on about June 10, 1936, a "short-tailed black bird" perched for half an hour on the shed gable at the home of Wilson Roberts, 200 meters east of the 1939 nests at Shiphead. I have neither seen nor heard of a Starling nearer to Cape Gaspé.

Several other cliff cavities along the Forillon have been occupied during one or more seasons. These are indicated on the map.

The total population has decreased since the peak year, 1939, when 13 nests were occupied, and 33 juveniles and several adults had gathered on July 15 at a field newly fertilized with fish heads. It may be that the species will not increase greatly in Gaspé County as a

whole. That it will remain less abundant on the Forillon than elsewhere in the region is to be expected, for along the south shore of the St. Lawrence River lie greater cultivated areas; similarly on the Bay of Chaleur. Even the lands about the head of Gaspé Bay and along the estuaries of its tributaries, the Dartmouth, York, and St. John rivers, constitute better feeding grounds than the steep, restricted fields of the Forillon. The same is true of much of the south shore of the Bay, and particularly of the broader farm lands along the eastern end of the Gaspé Peninsula.

At any rate, according to the accounts of fishermen when I arrived on July 26, the 1940 population was again small. Apparently four pairs had nested at Grande Grève, but none near Shiphead. The only new station was at Indian Cove, where a family was still present on July 31.

In 1941, three pairs nested in the Grande Grève cliffs, and another, as noted above, in a hole beneath the eaves of a shed overhanging the cliff. The St. George's Cove site, the one established in 1940 at Indian Cove, and the two easternmost at Shiphead, first used in 1939, were again occupied. Twenty-two birds seen at Grande Grève on July 23 made up the largest group seen in 1941.

Judging from letters received from fishermen at Shiphead and St. George's Cove, in addition to those of Mr. Hotton, the storekeeper at Grande Grève, Starlings decreased somewhat during 1942. In the spring and early summer, Hotton saw a few. After their departure as usual in August he saw none until October 11, when 12 perched in a row of spruces beside his home. At Gaspé Basin, Mr. Richmond also noticed very few in spring, none in autumn.

The spring of 1943, writes Wilson Bourgaize, brought several Starlings to his cove and dooryard at the western end of Shiphead settlement. Doubtless some of them again nested in his cliff, and others along the Forillon east of Grande Grève, for in January, 1944, Mr. Hotton wrote that "one made her nest in the north chimney of the red house," and that quite a flock, 50 or more, were around all summer and fall of 1943. This would indicate, as he judged, a few more than in previous years.

On the south shore of Gaspé Bay, opportunities for observation have been less frequent. The population is not far different from that of the Forillon. In driving along the roads with frequent stops, the greatest gatherings seen numbered 11 at Seal Cove opposite Grande Grève, October 8, 1940, and about 25 at Sandy Beach just east of Gaspé Basin, September 25, 1941. These may have been migrants.

Although no attempt was made to locate nests, adults have been seen near several small fishing villages under conditions indicating that they were breeding.

Evidence was obtained on the wider and more level farm lands bordering the estuaries of the three rivers tributary to Gaspé Bay that Starlings were more numerous there than on the Forillon or the south shore. None was seen along these streams above the last farms, nor did inquiry among the lumbermen bring information of Starlings seen at their large camps where food in considerable quantity was available about the stables and garbage dumps.

Along the south shore of the St. Lawrence from Cap-des-Rosiers to St. Anne-des-Monts, several summer trips gave the impression that Starlings are not increasing more rapidly there than about Gaspé Bay.

MIGRATION

To the rapidly accumulating evidence of an autumnal southward migration of Starlings from the more northerly portions of their range (Thomas 1934: 120), a few observations in Gaspé may be added. Although a few, perhaps most of the pioneers, passed the winter there, the great majority now move out. I have cited the autumn flocks associated with grackles in the fields about St. Marjorique. It is my belief that many of these come down through the Fox River 'portage' from the open country along the south shore of the St. Lawrence. It is quite possible that some of these Starlings come from some distance westward, for it is certainly true that many warblers, nuthatches, and sparrows pass eastward through Fame Point, Grande Étang, Griffon Cove, and Cap-des-Rosiers to the Forillon. Thence they move westward up the north shore of Gaspé Bay to the estuary of the Dartmouth River.

Only once on the Forillon, August 15, 1938, was a group of Starlings observed over the forest. About 20 birds that had been feeding about the fish-houses at Grande Grève suddenly rose, flew a short distance down the shore, circled inland behind the houses, and passed swiftly northwest up the coulee to disappear over the wooded Mt. St. Alban beyond the base of the Forillon.

After crossing the Dartmouth River at the head of the northwest arm of the Bay, these flocks of Starlings pass either through the portage from L'Anse-aux-Cousins to the fields along the York River estuary, or through the village of Gaspé Basin. Messrs. Fred and George Richmond report hundreds of Starlings and grackles feeding along the slopes above the town, and each year observe their departure "straight for the Forks of the St. Jean," that is, in a west-southwesterly direction. The significance of this phrase will presently become evident.

Such movement as I have seen on the south shore of the Bay indicates that the Starlings reared in that section may also move westward up the St. Jean. Small groups have been seen working up the north shore of the St. John estuary. Even more interesting is the north-westward progress of two small groups along the railroad at Seal Cove and Douglastown east of the river's mouth. That the movement of *Quiscalus*, especially during these early years of the Starlings' presence in Gaspé, should determine their southward path would not be surprising. For such mixed flocks are common in southern New England and elsewhere in autumn. The departure of the grackles has long been an annual source of wonder to the Richmond brothers. Although they have not kept written records, they insist that the great departure occurs about July 20. But they agree with me that considerable numbers pass through Gaspé much later in the season.

Evidence is gathering that warblers, thrushes, and robins, at least, pass westward in autumn up the valleys of the York and St. Jean. Future study may confirm the conjecture that these migrants cross the divides into the valleys of the southward-trending Bonaventure and Cascapedia rivers. This evidence will be presented in another paper now in preparation.

Dr. Lewis's records of Starlings on Prince Edward and the Magdalen Islands (1933) emphasize the independence of the species. Where an overland route is offered it appears to avoid the water, as around Gaspé Bay. But in order to reach Prince Edward it had to cross Northumberland Strait, a wider body.

Recently the Shetland race of Starlings has invaded northeastern Greenland (Bird and Bird, 1941). Whether their route included the Färoes and Iceland, or Norway and Spitzbergen, wide stretches of sea were crossed.

WINTERING OF STARLINGS IN GASPÉ

Following their first appearance in 1931, a few Starlings passed the winter in the vicinity of Gaspé Basin, coming occasionally for food to the dooryards of Fred J. Richmond and his neighbor. In subsequent winters he has seen small groups now and then. Four birds visited his barnyard throughout the winter of 1940-41. Six more appeared in late winter, remaining until the grackles arrived in March. He reported about 20 in his yard on December 20, 1943. Again, January 8, 1944, an extraordinarily large "flock of about 50 were perched on two crab-apple trees near my house where I fed them last winter and spring. They appeared busy eating either buds or the seeds out of crab-apples, as I left the greater part on the trees

last autumn. On the 11th the flock was back again." The numbers afterward fell off gradually to about 20 that continued daily to feed on grain provided throughout the winter. They were still present on April 14. Although four robins and a large flock of grackles arrived that morning, borne by a strong southeasterly storm, no spring addition to the Starling population had been made.

Writing on April 23, 1937, Franklin Gavey reported four Starlings at Grande Grève on the 15th, ten on the 16th, and some "heard every morning" thereafter. A few grackles also had arrived. On March 14, 1938, he wrote that "the starlings have been here all winter till about a month ago, when they disappeared. We fed them crumbs and scrap." Similar reports in succeeding winters, the last one concerning a flock of 50 or more that appeared in Grande Grève about Christmas time, 1943, after a six-weeks absence of Starlings, taken with Richmond's experience in Gaspé Basin, make it plain that a number pass each winter about Gaspé Bay, searching here and there for food. It is not unlikely that the 50 birds observed in Grande Grève in December, 1943, were those reported the following month by Richmond in Gaspé Basin, 12 miles westward.

The majority, however, migrate presumably southward. In other words, the population changes from season to season much as in New England.

SUMMARY

1. The first appearance in 1935, and subsequent history of the European Starling on the Forillon in Gaspé, Quebec, is recorded.

2. Adapting themselves to local conditions, the Starlings along the Forillon nest chiefly in cavities in the limestone shore cliffs.

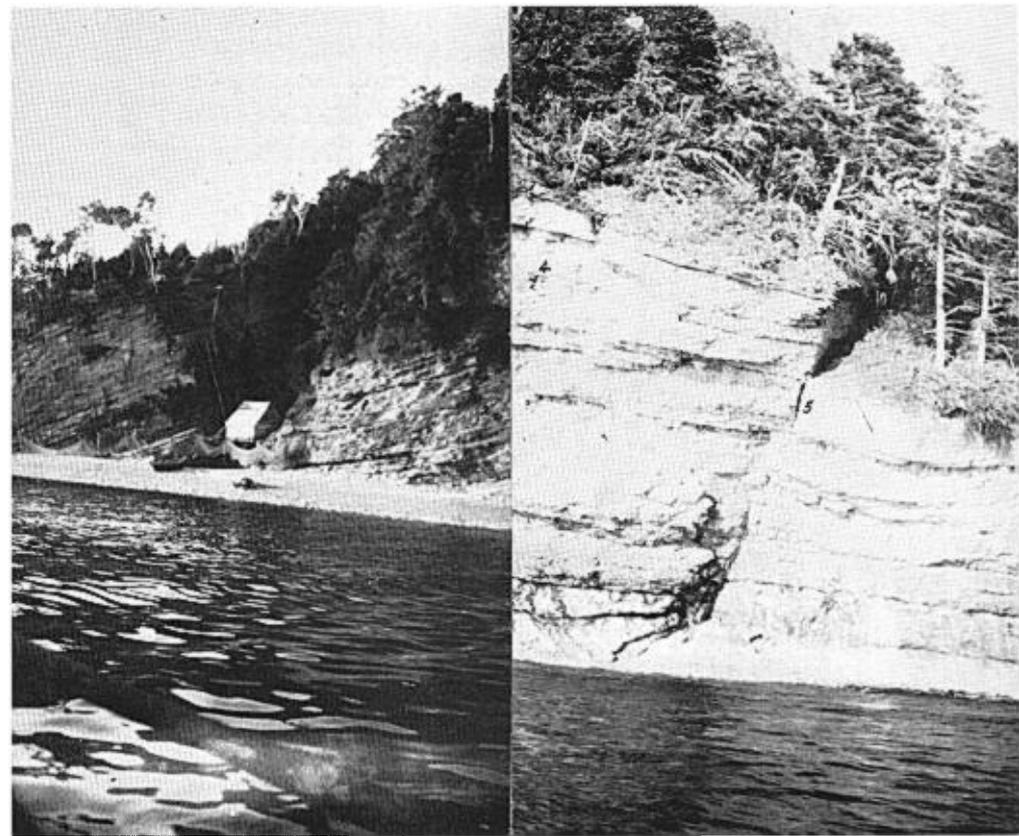
3. July 2 is the earliest known date on which young have left nests in the Gaspé region. In 1938 and 1941, first emergence occurred on July 2; in 1937 and 1939, on July 3.

4. In its initial attempt, a young bird was seen to fly 12 feet upward to a tree at the top of the cliff.

5. Although plenty of nest holes dot the southern cliffs of the Forillon, the Starling has not increased rapidly there. Crows constituted an effective control in 1937, destroying a number of young. In 1938 the Starlings chose holes less accessible to Crows.

6. Distribution of nests is correlated with favorable feeding grounds.

7. The extension of the nesting range from the base toward the tip of the Forillon was traced. No nests were built along the terminal three-quarters of a mile of shore, nor in the northern cliffs, 200 to 700 feet high, which present a sheer drop into the Gulf of St. Lawrence.



(Left) SMITH'S STAGE AT GRANDE GRÈVE; NEST SITES NOS. 1 AND 2. (Right) GRANDE GRÈVE; NEST SITES NOS. 4 AND 5.

8. The greatest number of nests observed on the Forillon was 13 in 1939. The largest fall flock seen by the author comprised 33 birds, also in 1939. Judging from letters received from residents, the population in 1943 may have been greater.

9. Although most of the Starlings migrate, a few have passed each winter in Gaspé. The number increased to about 50 in 1943-44.

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