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NESTING OF THE HORNED LARK ON BAFFIN ISLAND

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During our sojourn in southern Baffin Island from June 14 to August 22, 1953, we recorded the Horned Lark (*Eremophila alpestris*) almost daily. In the immediate vicinity of the United States Air Force Base, near the head of Frobisher Bay, it was less common than the Snow Bunting (*Plectrophenax nivalis*) and Lapland Longspur (*Calcarius lapponicus*), about as common as the Water-Pipit (*Anthus spinoletta*), and decidedly more common than the Wheatear (*Oenanthe oenanthe*). A low, moist, thinly grassed flat just above high-tide mark and near the Base's dump was a favorite gathering place for larks all summer. At least one pair nested there, or close by, and larks which nested some distance away went there with their broods. We never walked through this area without hearing and seeing several larks. On higher, drier, more gravelly flats just north of the Base, several pairs nested. Both of these habitats the larks shared with the only common shorebird of the neighborhood, the Semipalmated Plover (*Charadrius semipalmatus*). Larks, plovers, buntings and longspurs were familiar dooryard birds: we were apt to see any or all of them whenever we stepped out of the building in which we lived.

In the monotonous "desert tundra" of the high interior north and northeast of the Base, the Horned Lark was uncommon. We covered, fairly regularly and often, an 18-square-mile stretch of these rocky barrens, finding them to be disappointingly devoid of birdlife. Among passeriform birds, the Snow Bunting was the species we were most apt to see there. Often the only bird in sight was a Snowy Owl (*Nyctea scandiaca*) perched on a distant hilltop or flying with measured wing-beats, like a great white gull, across a wind-rippled lake. In this all but soundless country the larks had a way of springing swiftly from the ground with a startling *ee-dip*, *ee-zip*, or *ee-zee-dip*. Soper (1940: 16) mentions the Horned Lark among the species "most likely to be encountered" in these bird-poor areas of the arctic.

We saw or heard Horned Larks at all elevations, from the very edge of the salt water to the highest knobs of the interior. Wherever the land was flat or gently sloping, free of boulders, well drained, and sparsely covered with lichens, moss, and thin, short grasses, larks were likely to be. Several pairs nested on wide, sprawling gravel mounds along the east bank of the Sylvia Grinnell River about a mile upstream from its mouth, and in drier parts of the Davidson Point lowlands. We failed to record the species on islands in Frobisher Bay—not even on big, bluff Hill Island, directly southwest of the Base. At the mouth of the Jordan River, 16 miles west of the Base, we saw a few Horned Larks on July 13 and from July 17 to 20. We saw a family group of larks, and found an empty nest, near a large unnamed lake about 50 miles east-northeast of Wordie Bay at Lat. 68° 31' N., Long. 71° 22'

W., along Baffin Island's west coast, on August 8. At Lat. 65° 20' N., Long. 77° 10' W., near Cape Dorchester, we saw several larks on August 11. Along the southeastern shores of Lake Amadjuak (Lat. 64° 38' N., Long. 70° 28' W.) we saw several larks on August 15.

We mention these several localities since not so very long ago *Eremophila alpestris* was thought to be rare on Baffin Island. Kumlien (1879) did not even list the species from Cumberland Sound. From Oberholser's (1902) map showing the over-all distribution of *Otocoris* [= *Eremophila*], one would suppose that only a small part of extreme southwestern Baffin Island was inhabited by the genus at the turn of the century. According to Soper (1928:109), the first breeding record for the island was that of Hantzsch, who obtained two eggs from Eskimos on the Kekerton Islands, in Cumberland Sound, in 1909. As recently as 1946, Soper (1946:419) considered the lark "one of the scarcest of small land birds." Wynne-Edwards (1952:376) saw no larks at the mouth of Frobisher Bay in July and August, 1937. This alleged "scarcity" of larks may have been, in large part, a scarcity of human observers. In any event, Soper collected a fine series of adult larks in the course of his own exploration of southern parts of Baffin Island from 1928 to 1931 and Wynne-Edwards (*ibid.*, 375) reported on four specimens collected by him at the head of Clyde Inlet.

The day we started our 1953 observations (June 15) the flat lowlands about the Base were dark and bare, but the whole bay was ice-covered and the high interior, from the nearest slopes upward, was half-white with snow. We spent much of our time that day along the bay-shore and on the flats and lower hills just north of the Base. Here we counted about 15 larks, all males. The wind (south-southwest) was fairly strong (maximum velocity 14 mph) and the air decidedly chilly (minimum temperature 28.2° F., maximum 39.1°) despite the brightness of the sun. Some snow fell. We heard lark-song frequently, but saw no bird singing in the air. Singing males usually perched on rocks or mossy hummocks, but some of them sang without seeking the slightest eminence. Occasionally we came upon two males a few inches apart, facing each other with heads lowered and horns lifted conspicuously. After holding such a threatening pose for an instant, each bird walked about with mincing steps, head moving jerkily up and down or from side to side in obvious resentment over the proximity of the other. The excited, almost incessant twittering sometimes worked itself up into perfunctory song. The birds never came to actual blows on the ground. Instead, as a climax to their altercation, they fluttered upward 15 to 20 feet, clawing and biting at each other the whole way. These aerial battles sometimes ended in a chase. Once we saw three larks—all males—chasing each other in a sort of free-for-all. Pickwell (1931:135), describing the courtship behavior of the Prairie Horned Lark (*Eremophila alpestris praticola*), says: "The males . . . frequently strut before each other and often peck the ground furiously, like barnyard cocks, but all fighting is in the air." Cottrille (1950:134-135) well describes aerial fighting between two male *E. a. praticola* in southern Michigan.

Aware of the statements of Soper (1928:108-109 and 1946:418-419), Sutton (1932:211, 217) and Wynne-Edwards (1952:375-376) concern-

ing Baffin Island's mixed populations of "yellow-faced" and "white-faced" larks, we made a point of studying critically each bird we saw. Of the 15 males above referred to, 14 were fairly bright yellow, one was pale yellow, and not one was even approximately white, on the throat and face. In general they looked like the larks Sutton had observed on the Labrador coast in the summer of 1920. We decided not to collect any specimens until we had discovered at least one or two nests. Notable among our June 15 observations was this: we did not see a female lark anywhere. Actually, as subsequent work proved, most of the larks were paired; many females were on their nests, incubating eggs; and many males were defending territories by mid-June. All this defense of territory was directed, so far as we could see, toward other male larks. They paid not the slightest attention to the several, and clamorous, Semipalmated Plovers which followed us all over the flats; or to the Lapland Longspurs, which seemed to prefer the grassier, slightly more moist, areas.

On June 16 the air temperature rose a little (minimum 30.5°, maximum 41.2°), but the wind continued and we had another light snow-fall. That day we observed several larks singing flight-songs above the high country east of the Base, and we saw one female bird (yellow-faced). Bearing in mind the species' reputation for early nesting; remembering also our special interest in two-broodedness, we wondered if any young larks were already out of nests.

On June 17 we found our first nest (Nest 1). It contained four eggs. It was about 400 yards north of the Base in an area which had recently been disturbed by construction work. It was at the edge of a bare patch of gravel and was slightly sheltered to the east by a tussock of foot-high grass. A few bits of dry moss had been placed about it as a sort of pavement. We found it by watching first the male, a yellow-faced individual, then the female, also yellow-faced, which suddenly appeared "out of nowhere," and whose behavior, from the moment we first saw her, was patently broody. The male and female paid little attention to each other, so far as we could tell, and presently the male flew off. The female was restless. Though she went through the motions of hunting for, and finding, food, we were not sure that she actually swallowed anything. Her plumage was fluffed out. Occasionally, after shaking herself, she became sleek, but her feathers soon lifted again. She walked rapidly, pausing occasionally to lift her head and give an anxious chirp. Finally, after much wandering about, she ran swiftly to the nest and settled on it. As we came up, she ran off with wings partly spread, rose in flight when a few yards away, circled quickly, and alighted within about 30 feet. Now her broodiness was more apparent than ever. She chirped occasionally, but the male did not join her. The nest was thick-walled and warmly lined with brown last-year's tassels of bog-cotton (*Eriophorum*). The eggs were rich, deep, greenish gray in ground-color, and were very heavily spotted.

On June 18, at 5:45 a.m., we found the female sitting closely on her four eggs. We almost touched her before she flew off. At 3:15 p.m. we went to the nest again, finding three young and one egg. At 5:30 p.m. one egg still was unhatched. The nestlings were well covered

above with yellowish buff down. They probably were asleep, for they neither lifted their heads nor opened their mouths. Both parent birds were near the nest, each carrying a bit of food, when we left. Pickwell (1931:140) states that young Prairie Horned Larks are fed "within an hour or two following hatching."

At 6 a.m., June 19, we found all four young hatched. One held its mouth wide open during the whole of our three-to-four-minute visit. This was probably the youngest of the brood, for it was slightly the smallest, and its down was a trifle yellower than that of the others. The parent larks objected mildly to our presence.

Near the Sylvia Grinnell River, well west of the flats about the Base, we collected that day two male larks and a female, the males with greatly enlarged testes, the female with well-defined brood-patch and swollen oviduct. All three of these specimens were yellow-faced, and we saw no white-faced lark among the four pairs we saw in that area. The plumage of the female was much worn. Another female, which we watched at the west edge of the Base, was feeding young. From the smallness of the mouthfuls she carried we judged that her brood had only recently hatched. We did not find her nest or see her mate.

On June 20 we spent several morning hours on Davidson Point. We saw in that area four yellow-faced males (one of which we collected) and a pale-faced male, but not a single female. A male whose facial colors we did not check on was in the air, singing.

On June 21, at the Base, we followed a yellow-faced female about for half an hour, hoping she would lead us to her nest. Suddenly she was joined by a yellow-faced male, which squatted a foot or so from her, fluttered his wings, and, while looking directly toward her (as well as toward us), spread his black chest-patch in a rather striking display. This must have entailed a lifting of the feathers at each side of the chest, or possibly of the whole chest-patch. The display was unfamiliar to us, and we find no reference to it in Pickwell (1931), Bent (1942), or "The Handbook of British Birds" (1948, Vol. 1, p. 185).

On June 22 we closely examined the young larks in Nest 1, noting that their natal down appeared to be less colorful than it had been on June 18 or 19, and that it was of the same shade throughout the whole brood. The more we thought about, and searched for, pale-faced adults the more convinced we became that some young birds should be recognizably pale at various stages in their development. On June 22 we covered two or three square miles of high country north and northwest of the Base. The two pairs of larks we located in that area were about half a mile apart. All four birds were yellow-faced.

On June 24 we found Nest 2. It was along the edge of a small lichen-covered flat about half way to the top of the first hill east of the Base, and about a quarter of a mile from Nest 1. It held five eggs, all of which were less richly colored than those in Nest 1 had been. It neatly filled a deep cup in the lichens; was not sheltered in the least by a rock or tuft of grass; and was warmly lined with tufts of bog-cotton and willow-down. There was no pavement of pebbles or the like about it. Finding the nest required an hour's observation of the female,



FIG. 1. Horned Lark Nest 2. Frobisher Bay, Baffin Island, June 25, 1953. Note warm lining.

whose behavior seemed to be profoundly affected by the singing of her mate. We watched the female through binoculars from a position which proved to be quite close to the nest. We could not keep her in sight all the time, for she had a way of walking upslope and disappearing among the moss and rocks. The male did not sing often. If he sang while the female was out of our sight, she promptly flew in and alighted close to us. If he sang while she was walking near us, she quickened her pace perceptibly, sometimes after an abrupt change of direction. His singing obviously heightened her desire to return to the nest. We found the nest by noting the directions she took when walking double-time immediately after the male's songs. The way in which instinct seemed to control her behavior was most interesting: unstimulated by the male's song, she wandered about with what appeared to be studied aimlessness; stimulated, she walked rapidly toward the nest for several feet then paused, as if reconsidering, and resumed her "studied aimlessness." The male, a yellow-faced bird, we did not often see that day. He sang not from the sky but from the ground upslope a considerable distance from us. We firmly believe that he was unaware of the female's absence from the nest, for neither did she call to him nor did he join her. The female was very dull-



FIG. 2. Young Horned Larks in Nest 3. Frobisher Bay, Baffin Island, June 25, 1953. Note (a) pattern of young lark's tongue; (b) absence of warm lining material.

colored. Her throat and eyebrows were grayish yellow and the dark markings of her head were indistinct.

We found Nest 3 on June 24. It was at considerably greater elevation than, and about three hundred paces from, Nest 2. It was in the side of a small, lichen-covered hummock, in this respect being very different from Nests 1 and 2. The area immediately about the hummock was, however, gentle in slope, almost flat. The nest contained four several-days-old young, one of which was slightly paler or grayer in tone throughout the upper parts than the others. This lack of warm tones was perceptible in the natal down as well as in the incoming juvenal plumage. The parent birds were both yellow-faced. The male we watched closely for some time before finding the nest. Refusing to feed the young because we were so near, he continued to carry about a great mouthful of food for them. This burden did not seem to affect in the slightest the clarity of his alarm-notes. Suddenly, seeing a large spider near him, he dropped the food, almost spitting it out; ran after, caught, and killed the spider, and went back promptly after the lost mouthful. Pickwell (1931:140) states that the male Prairie Horned Lark brings "greater burdens" of food than the female to the young.



FIG. 3. Young Horned Larks scattered below Nest 3. Frobisher Bay, Baffin Island, June 27, 1953. Note nest's thin, ruffled lining.

About half a mile east of Nest 3 we saw a very pale-faced male lark—almost a white-faced bird—on June 24. This individual we did not collect because we wanted to find its nest and ascertain the ratio of pale to “normal” young in the brood. We did not see a female in that area.

On June 25 we went to Nest 2 at 7:30 a.m., finding none of the five eggs hatched. The female was not there. Presently she flew in and we withdrew long enough to permit her to return to the nest. For about an hour thereafter we waited, hoping to see the male take food to her, but he did not appear. At Nest 3 we took photographs so as to record the pattern of the young lark's open mouth. The mouth-lining was rich yellow save for a dusky spot at the tip of each mandible and three dusky spots on the tongue—one at the very tip and one on each side just back from the tip. No photograph in Pickwell (1931) or Bent (1942) shows this pattern at all accurately. This may be largely because yellows tend to photograph over-dark.

On June 26 we collected a yellow-faced male lark in high country about a mile northwest of the Base. The yellow was most intense on

the forehead and in the middle of the throat. The whole superciliary line was clear pale yellow.

On June 27 we visited Nest 1, finding only three young there. Not having marked the brood, we could not be sure that the missing bird was one of the three that had hatched between 5:45 a.m. and 3:15 p.m. on July 18, but we suspected that it was the oldest of the siblings and that it had left normally, for there was not the slightest indication otherwise that the nest had been visited by a predator. We banded the three young, all of which settled down as we returned them to the nest-cup. Their willingness to stay surprised us.

We also visited Nest 3. Here we found the brood crouching motionless within a few inches of the nest. We banded all four and were surprised that none made much of an attempt to get away. One was decidedly yellow throughout its under parts, the others white-bellied. The bird with the grayest upper parts and palest down was white-bellied. This individual we color-banded (blue over aluminum). Why the young were out of the nest we could not understand. The nest was not sheltered in the least from the wind; indeed, being at the hill's brow and near the top of the hummock, it was in a decidedly exposed position. Furthermore—and this may have been an important factor—it was very thinly walled and poorly lined. There was not a feather nor a bit of bog-cotton, willow-down, or hair in it. When we returned the four young to the nest-cup they settled down immediately.

Nest 2 held four young and one egg when we inspected it at 8 a.m., June 27. The natal down seemed to be of exactly the same rich shade of yellowish buff throughout the brood. The young birds opened their mouths, but made no begging sound.

On June 27 we found Nest 4. It was toward the tip of Davidson Point near the edge of a great gravel flat, in the very top of a foot-high, lichen-covered hummock. It contained three eggs. The site was exceptional, for the hummock and a score of similar hummocks close by all stood in water about an inch deep. We found the nest after watching the female—a yellow-faced bird—for about 20 minutes. We did not see her mate. The nest was fully a mile from any nest we had thus far found. Like Nest 2, which also was surrounded by lichens, it had no pavement of pebbles, etc.

On June 28 we visited Nests 1, 2, and 3. In Nest 1, at 6 a.m., there were only two young. Another sibling probably was in the vicinity, but we failed to find it. The two young left the nest when touched. They hopped and hobbled rapidly off, spreading their wings, but making no attempt to fly. Their departure must have been very slightly, if at all, premature, for we could not have frightened them badly. They were about 10 days old. Pickwell (1931:142, 143) states that young Prairie Horned Larks leave the nest, normally, on the tenth day.

At Nest 2 we saw the male and the female parent each take food to the young direct. We visited the nest at 6:45 and 10 a.m., ascertaining that there were only four young. One egg of the five failed to hatch. The young birds, when open-mouthed, made no sound that we could hear.

At Nest 3 (at 7:20 a.m.) all four young were scattered about the hummock much as they had been on June 27. They made no attempt to get away from us. Near one of them was a slight accumulation of droppings. One bird, after being held in the hands for a time, livened up and opened its mouth for food. It did not, however, make a sound of begging. An adult female lark gave cries of protest in the vicinity but did not come very close. At 7:50 p.m., we found only two young on the nest hummock.

Starting on the evening of June 28, a four-day spell of very bad weather made life difficult for the Nest 3 brood. The wind was not particularly strong, but the sky was gray and fog hung low much of the time. Often it rained. When we visited the nest early in the morning on June 29 we found three young larks on the hummock, outside the nest-cup. They were obviously in poor condition, being stiff and wet. When we returned to the nest at 7:45 a.m., one of them was dead, and the other two looked half-dead. A parent lark continued to give alarm-chirps in the vicinity but the two living young looked as if they had been utterly deserted. We preserved the dead nestling as a skin. It was a white-bellied female.

We visited Nests 1 and 2 also on the raw, wet morning of June 29. At Nest 1 we found no larks, either adult or young, anywhere in the vicinity. At Nest 2 the four young were arranged with heads all pointed toward the middle and lifted, as if ready to receive food from that position (see Pickwell, 1931, plate 33, fig. 1).

Late in the afternoon on June 29 we found Nest 5. This was near the building in which we lived at the east edge of the Base. We had passed it many times in our comings and goings. It held four eggs. It was about 400 yards from Nest 1 and 300 yards from Nest 2. It was warmly lined with white dog hair, and had a slight pavement of pebbles to the west. We found it by paying close attention to the female (yellow-faced), which we chanced to see flying low 50 yards or so from the nest. She must have been used to human beings, for she returned to the nest rather promptly despite our standing, in full view, not far away.

For some time on June 29 we watched a male lark in flight-song. The weather was very bad—the sky gray, the wind cold. But the bird sang determinedly—almost as if in counter-challenge to the weather.

On the morning of June 30 the two young larks just outside Nest 3 were dead. One of them bore the color-band. The only adult lark in the vicinity was a female. The loud alarm-cries of this bird suggested the possibility that one member of the brood was still alive. The two dead nestlings we preserved as specimens: one was a white-bellied male (color-banded); the other a yellow-bellied female. Thus became apparent an interesting fact: in this brood one female was white-bellied, another yellow-bellied. In the prepared skins the difference was striking. The gonads in each of the three nestlings had been clearly visible: there was no doubt as to their sex.

We visited Nest 3 again on the morning of July 1. An adult female lark was there—again giving alarm-cries. This convinced us that one bird of the brood was alive, but we could not find it. It probably was

older than the others, had claimed food promptly, and survived. Pickwell (1931:143) summarizes the procedure by which the older young Prairie Horned Lark (or Larks) may, through pushing "to that side of the nest over which the food always comes," survive at the expense of the rest of the brood. Parmelee followed a female lark (yellow-faced) about for some time north of the Base and finally found a young bird it was feeding. In approaching and leaving the young bird it invariably walked (i.e., did not fly). The young bird, which was unbanded, ran well but could not fly. This observation made clear that a young lark, though it hops when first out of the nest, may learn to run before it learns to fly.

A soldier told us of finding a bird's nest on a high gravel flat about half a mile southeast of the Base on July 1. In the nest were two "spotted" young birds, alive, and outside it a third young one, dead. Almost certainly this was a Horned Lark's nest, for longspurs nested only in the grassy meadow-tundra of that area, and a bunting nest or wheatear nest would have been among, or under, rocks. We learned nothing as to the fate of the two remaining siblings.

The weather was exceedingly bad on July 1—but we observed several male larks singing flight-songs that day.

On July 2 we caught and banded a young bird near the dump. It could fly a little. On the ground it ran—not very nimbly, to be sure, but ran rather than hopped. Only one parent, the male, was in sight thereabouts while we were chasing this young bird. In high country just east of the Base we saw a young bird which could fly well. Its remiges and rectrices were not of full length, however, so it probably had not been out of the nest more than a few days.

We visited Nest 4 (Davidson Point) on July 2. The nest and eggs were wet and looked deserted. Neither the male nor the female lark was anywhere to be seen. The four young in Nest 2 seemed to be doing well. At Nest 5, at the east edge of the Base, there were still four eggs. Watching with our binoculars, we had seen the female fly off when we were 60 yards or so away. This behavior to some extent explained why we had not found the nest earlier.

On July 3 we noticed that the natal down on one chick in Nest 2 seemed to be a little paler, or whiter, than that of the other three. We saw the female parent near this nest, but not the male.

On July 4 we banded the four young in Nest 2. The nestlings were quite calm while we lifted them out and attached the bands, but as we were returning them to the nest-cup the father bird flew in and gave an alarm cry, one of the young cheeped sharply in response, and the male flew straight at us, thrashing about with extraordinary boldness and abandon. His wings touched us several times. The female too flew in, and by this time the panicky brood were making off in all directions. Never had we known a lark to behave as the male did: he was fairly beside himself with excitement. The female became excited too, when she heard her mate's cries and saw him flouncing about, but her demeanor was comparatively calm. Pickwell (1931:140-141), writing of *E. a. praticola*, states that the male's solicitude for the young "is restricted to calls." We caught the four young, returned them to the

nest, and quieted them down; but when we visited the nest again an hour or so later it was empty (save for the unhatched egg), and the young were nowhere to be seen. Their departure from the nest on this, their eighth or ninth day, probably was somewhat premature.

Visiting Nest 5, we found three young birds and one egg. We marked a toe of each of the three young with red fingernail polish. Neither parent bird was at the nest. The fourth young one had hatched by early morning of July 5. The youngest bird was perceptibly smaller and yellower of down than the others. Now that, twice in one season, we had noticed the intensely yellow tone of the down of a newly hatched lark, we decided that this color must fade rapidly, for after the first day the chick's appearance did not seem to be different from that of the rest of the brood.

On July 5, just north of the Base, along a little stream flowing past the hangar, we spent half an hour watching a pair of larks whose behavior led us to believe that they had a nest or young close by. Both larks were yellow-faced. The male had a large load of food, the female none. Repeatedly we saw the male, with mouth full, walk toward the female, flutter his wings in the manner of a young bird begging for food, then step rapidly off, exactly as if trying to attract her attention. Her only activity seemed to be the giving of alarm-cries. This she continued to do, while the male, still carrying food, ran back and forth, now standing beside her, with fluttering wings, now stepping coyly off to one side. Suddenly a young bird, well fledged, flew past the female, alighting within a few feet of her. The male departed. The female made no move to feed the young bird.

On July 5 a civilian contractor with whom we had become acquainted showed us a lark nest (No. 6) he had found near a little lake in high country about two miles north of the Base. The nest was warmly lined with soft material and surrounded by a pavement of angular pebbles. There were four eggs. The incubating female (yellow-faced) was remarkably fearless. She allowed us almost to touch her. When finally she left the nest she ran off a short way and stood quietly with feathers fluffed out. We did not see her mate.

Two larks which Sutton saw near the empty Nest 3 at the top of the hill just east of the Base on July 5 acted as if they were pairing. This reminded us that we had not yet found the slightest evidence of two-broodedness. On Davidson Point, Parmelee saw a pale-faced adult male and found a dead young lark which probably had left the nest only a day or so before.

From July 5 to 12 we noted so much flight-singing and so many times saw larks chasing each other as if in courtship or defense of territory, that we were confident certain pairs were about to proceed with a second nesting for the season. We observed no copulation or nest-building, however, and the only additional nest we found almost certainly was a first one for the season — or at any rate the female which built it had not already reared a brood in 1953. We found this nest on July 10. It held four eggs—which, since they floated big-end-up, probably had been incubated several days. The nest was on a high, narrow, gently sloping shelf between a big lake and the "HBC

River"—our name for a stream which emptied into the bay not far from the Hudson's Bay Company post. The nest was warmly lined. It was sheltered somewhat by *Cassiope*. We found it through watching a yellow-faced male we happened to see along the lake shore, a long way downslope from the nest. He was carrying a spider or insect in his bill, so we watched him. Presently he caught a large crane-fly and started flying uphill. The farther he flew the more convinced we became that he was going to a nest rather than to a young bird, for young larks had a way, we had noticed, of following the parents about. The male flew three hundred yards or so. Using our binoculars, we watched him alight, marked the spot, and followed. We did not see him again, but we flushed his mate (a yellow-faced bird) from her nest only a few feet from the spot at which we had seen him alight.

This would seem to be fair proof that the male takes food to the female while she is incubating. The "Handbook of British Birds" has nothing to say about the subject. Sutton (1932:215), writing of *E. a. hoyti* observed by him on Southampton Island, says that the male "occasionally brings . . . food" to the incubating female, but he discusses no specific observations. Pickwell (1931) apparently never saw a male *E. a. praticola* take food to the incubating female. On p. 91 he says: "The male, beyond occasional call notes, showed little or no solicitude while eggs were in the nest."

On July 10 we spent some time near the site of Nest 1. We saw there a banded young lark being fed by both parents. All three were remarkably tame. The young bird could fly well, though its wings and tail were not quite full-length. We assumed that it was from Nest 1—a natural, though unwarranted, assumption. In any event, the observation was of interest, for the last young lark banded by us we had banded on July 4, and that individual had already left the nest, so the parent larks were feeding progeny at least six days out of the nest. The begging cry of the young bird was a soft *sweet*, so faint it was hard to hear.

On July 10 we visited Nest 5, finding it destroyed. It was out of its cup and strewn about, and the four dead young, together and somewhat flattened, but neither crushed nor partly eaten, were about six inches west of the nest remains. We noticed that a big plank by which we had marked the nest-site was no longer there. Workmen probably had stepped on the nest while carrying off the plank.

On July 11 we collected an almost white-faced female in high country about a mile and a half north of the Base. She had a well-defined brood-patch. We did not see a male with or near her. We visited Nest 6, finding that it held only three young, all of them about the same in down-color. The female parent was still very tame. Here we made a point of placing our ear close to the five-days-old brood, finding that they produced a faint sound of begging.

On July 12 we saw two banded young larks on the flat near the dump—both of them still being fed. We were not sure how many adults were feeding them, and they may well not have been siblings, though they certainly were of about the same age. The spot was very near that at which we had caught and banded the single young bird on

July 2: it was about half a mile from the place at which we had seen the banded bird being fed on July 11; and it was even farther from the nests at which we had banded the young on June 27 (Nests 1 and 3) and July 4 (Nest 2). So, despite our not knowing exactly which birds we were seeing, we had good evidence that at least one young lark had travelled half a mile or so in following its parent (or parents) to a favorite feeding-ground. We must have seen a total of 20 larks near the dump on July 12, half or more of them strong-flying young birds. Among the three or four adult males there was a good deal of full-voiced, fervent singing, all from the ground. In a wholly different area we observed one male singing a flight-song.

That same day we visited Nest 6 on Davidson Point, to our great surprise finding there three fine young larks, all of them ready to leave. No bird of the brood was especially pale or gray above, but on the under parts one was strikingly yellow, the other two white. We color-banded the brood, each on the right leg, dark green over aluminum. We returned them to the nest-cup, but they would not stay.

We heard no full song of any sort—either from the ground or from the air—after July 12. The nesting season was over. Dr. V. C. Wynne-Edwards told us of an incomplete song heard by him on July 15. In four of the seven nests we had observed, some or all eggs of the clutch had been laid after June 14 (the date of our arrival), but we had failed to find the nests early enough to obtain data as to the length of the period requisite for producing a brood. Terrill (1917:138) had reported a period of “twenty-five days, or possibly a little less,” for *E. a. praticola*. We had been hoping to prove that *E. a. alpestris* could, with the help of the long arctic days, bring out a brood in a significantly shorter time. The following table presents certain of our nest data concisely.

TABLE 1
SEVEN BAFFIN ISLAND HORNED LARK NESTS

Nest No.	Date found	Clutch-size	No. young that hatched; date of hatching	No. eggs that did not hatch	No. young known or believed to have died at nest	No. young known or believed to have left nest normally	Approx. date of leaving nest
1.	June 17	4	4, June 18-19	0	0	4(3*)	June 27-28
2.	June 24	5	4, June 27	1	0	4*	July 4
3.	June 24	4	4, <i>circa</i> June 19	0	3	1(?)	June 29
4.	June 27	3	3, <i>circa</i> July 3	0	0	3*	July 12
5.	June 29	4	4, July 4-5	0	4	0	—
6.	July 5	4	4, July 8	0	1	3	July 18
7.	July 10	4	—	—	—	—	—

*banded while in nest

Inspection of Table 1 reveals the following facts: Clutch-size did not vary much. Five of the seven nests held four eggs; one held five eggs; one held three eggs. Of the total of 28 eggs, four (Nest 7) may or may not have hatched. Of the other 24 eggs, we know that 23 hatched and that one did not hatch. This one egg was of a clutch of five (Nest 2). Of the 23 young we know that four were destroyed (Nest 5) when they were about five days old; and that three died

(Nest 3) as a result of inadequacy of nest-lining, exposure of the nest-site, death of the male parent, or shortage of insect food during the very bad weather—or from all four causes. One young bird of a brood of four (Nest 6) disappeared when the brood was only a few days old. We feel quite sure that of the 23 young, nine (two from Nest 1; four from Nest 2; three from Nest 4) left the nest in good order.

Not apparent from Table 1 is the fact that the only poorly lined nest (No. 3) of the seven was 75% (perhaps 100%) unsuccessful. Various authors have discussed the possible correlation between thickness of nest-lining and earliness of nesting. Hess (1910:26), writing of *E. a. praticola*, has this to say: "First nests are placed in closely cropped pastures, sunken even with the surface and, woven solidly, are able to withstand the fierce March winds. The June nests are placed at the hills of corn and so loosely constructed that one as a whole could not be lifted from the ground." Our Nest No. 3 was just such a nest as one of Hess's "June nests." Indeed, we tried to preserve it and it went to pieces while we were lifting it from its cup. Absence of warm lining material obviously was not correlated in this case with lateness of season; nor was a nest found March 31, 1922, at Pittsburgh, Pennsylvania, and reported on by Sutton (1927:140-141), warmly lined despite its being an early nest for that latitude. Nest 3 was an abnormal nest in two respects: it was very poorly lined, and it was placed near the top of a hummock in a position which exposed it to the wind.

On July 16 we saw several adult and young larks on the flat near the dump — among them one banded young bird. Two adult males sparred a bit, as if in territorial fight, but the dispute did not last long. Interested in checking plumage-stage, we collected a yellow-faced adult male and the unbanded, full-winged young bird which persisted in following it about, begging for food. The begging cry was virtually the same as that which we had heard from much younger birds. We were surprised to find both specimens molting. The adult male (GMS 11760), a worn and dirty bird, had dropped virtually all the greater and middle wing coverts, many upper tail coverts, some of the inner primaries, and a considerable number of feathers from an area in each side of the chest. In the young bird, a male (GMS 11761), the primaries were molting—again from the innermost outward; but all 12 tail feathers were present, and the body plumage was still largely juvenal.

DESCRIPTION OF SPECIMENS

The following seven adult Horned Larks were taken in the vicinity of the United States Air Force Base, near the head of Frobisher Bay, in the summer of 1953. The measurements are in millimeters.

No.	Sex	Date	Wing	Tail	Culmen	Tarsus
GMS 11709	Male	June 19	113	76.5	13.5	24
DFP 50	Male	June 19	111	73	14	24
GMS 11713	Male	June 20	112	76	14	24
GMS 11727	Male	June 26	110	74	14.5	25
GMS 11760	Male	July 16	113	72.5	14.5	24
GMS 11710	Female	June 19	102.5	63	12.5	23.5
GMS 11749	Female	July 11	100	62	13.5	23

The males of this series are all yellow-faced, the most colorful being GMS 11713, the least colorful, GMS 11709. The less yellow of the two females, GMS 11749, is decidedly the whitest-faced bird of the whole series. In this specimen the throat is pale yellow, but the white neck-plumage bordering the black chest-patch is only very slightly tinged with yellow, and the forehead, superciliary area, and feathers encircling the eye are all grayish white, without any yellow whatever. The palest-faced of the males (GMS 11709) is considerably more yellow through the forehead and fore part of the superciliary area than this pale-faced female.

A young male in juvenal plumage collected on July 16 (GMS 11761) is white-bellied, but the white is suffused with grayish yellow. The wing of this specimen measures 99.5 mm., the tail, 59. The two grayish brown middle rectrices are crossed toward the tip by four irregular blackish brown bars.

The three young birds from Nest 3 (female, GMS 11732, June 29; male, GMS 11734, June 30; and female, GMS 11735, June 30) had, it must be remembered, yellow-faced parents. We did not collect either of the parents. All three nestlings are yellow on the chin and throat, but the last is strikingly yellower throughout the under parts than the other two. The one male of the three is the least yellow, or least colorful, generally speaking. In this specimen the natal down clinging to the sides of the crown and the light spots at the tips of the crown and hind neck feathers are grayish white rather than warm yellowish buff, as in the other two.

Whatever the correlation between this apparent dichromatism among nestlings and the admixture of yellow-facedness and white-facedness among adults, most certainly we did not encounter in the Frobisher Bay area the "predominance of pallid types" reported for the head of Clyde Inlet by Wynne-Edwards (1952:375). What we found was yellow-faced birds — with a mere scattering of pale-faced *hoyti*-like individuals. Such populations, "with *alpestris* characters predominant," Soper (1946:418) has reported for southern Baffin Island as a whole. In our collecting from about July 1 on we *tried* to obtain white-faced birds. The ratio of six yellow-faced individuals to one white-faced would not necessarily, therefore, hold for the entire population. Of the 15-20 males we continued to see in the vicinity of the Base, not one was really white-faced, and only one did we describe in our notes as "pale-faced." The females all seemed to be yellow-faced with the possible exception of the female at Nest 2, a very dull bird. This individual was yellow-throated, but her face otherwise may well have been without yellow tinge. Our Davidson Point notes include repeated comments on a white-faced male, but we believe that only one such bird lived there. Another white-faced male lived half a mile east of the Base, near a Snowy Owl nest we often visited. Totalling, as accurately as we can, the yellow-faced and white-faced birds observed, we obtain a ratio of about 10:1 for the males and 7:1 for the females. If, therefore, the pale-faced birds represent the subspecies *hoyti*, and the yellow-faced birds *alpestris*, we are forced to conclude that, in so far as color is concerned, *alpestris* is predominant.

With regard to size, we feel less certain. Our Frobisher Bay adult specimens, listed above, average: males, wing, 111.8, tail, 74.4; females, wing, 101.2, tail, 62.5. Ten male *E. a. alpestris* from Labrador measure: wing, 111, 110, 116, 109, 113, 106, 111, 110, 111, 111 (average, 110.7); tail, 67, 67, 70, 65, 70, 62, 66, 66, 63, 73 (average, 66.9). Ten females from Labrador measure: wing, 103, 104, 102, 106, 100, 103, 100, 102, 105, 108 (average, 103.3); tail, 62, 59, 58, 59, 52, 60, 62, 60, 62, 67.5 (average, 60.1). Our Baffin Island males are, it will be noted, considerably longer-tailed than the Labrador males. Otherwise there is no very great size-discrepancy. *Hoyti* and *alpestris* are both described as "large northern races."

NEST SUCCESS AND SPECIES SURVIVAL

Of the seven nests we found (see Table 1), three were known by us to have been more or less unsuccessful—Nest 5, 100%; Nest 3, at least 75%, Nest 6, at least 25%. About Nest 7 we knew only that it held four much-incubated eggs on July 10, that it was warmly lined, and that it was somewhat sheltered by *Cassiope*. We know, because we saw bands on their legs, that at least two of the several nestlings we watched from day to day lived long enough to fly strongly, but neither of these individuals was obtaining all its own food on July 12, the latest date on which we saw them.

We did not obtain the slightest evidence of two-broodedness. We found no deserted eggs; obtained only a bit of evidence of predation—namely, the disappearance of one young bird from the brood at Nest 6; found no Horned Lark remains, either of adult or young, at any of the several Snowy Owl nests we visited more or less regularly. Weasels (*Mustela erminea*) and foxes (*Alopex lagopus*) were exceedingly scarce in the area we studied most thoroughly. Lemmings (*Lemmus trimucronatus* and *Dicrostonyx groenlandicus*) were common, even locally abundant, but nothing that we observed convinced us that these rodents were predatory in the usual sense of the word.

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SUMMARY

1. At the United States Air Force Base near the head of Frobisher Bay, southern Baffin Island, the Horned Lark was one of the four commonest nesting birds in the summer of 1953. We recorded it also in the high interior north and northeast of the Base, at the mouth of the

Jordan River, at Lake Amadjuak, at Cape Dorchester, and near a large lake about 50 miles east-northeast of Wordie Bay. We did not find it on islands at the head of Frobisher Bay.

2. The Frobisher Bay breeding population was an admixture of "yellow-faced" and "white-faced" birds, the former predominant. The ratio of *observed* yellow-faced to white-faced males was 10:1, of females, 7:1. In each of two broods whose parents were both "yellow-faced," one nestling was very yellow-bellied, the others white-bellied. In one of these mixed broods, the yellow-bellied bird was a female, one of the white-bellied birds was also a female, and one white-bellied bird was a male. The white-bellied male was distinguishable from all three of its siblings by the whiteness (rather than buffness) of both the natal down and the spots on the incoming dorsal juvenal plumage.

3. By June 15 most larks of the Frobisher Bay area were paired, many nests finished, and some clutches laid. On that date we saw at least 15 males, but no females. The females probably were on their nests. Our latest date for a nest with eggs: July 8; for a nest with young: July 18. We obtained no evidence of two-broodedness.

4. We saw a male displaying by facing the female squarely and lifting or spreading the feathers of his black chest-patch.

5. We obtained no evidence that the male lark incubates the eggs or broods the young. We saw a male make a long flight with food to an incubating female, but were not sure that the food was delivered at the nest proper.

6. A female we were watching while discovering her nest invariably flew in toward the nest if the male sang when she was several rods away; if she happened to be near the nest when the male sang, she instantly turned toward the nest, walked rapidly in that direction for a short distance, then, as if recognizing us as untrustworthy, resumed a studied aimlessness.

7. We saw a male lark, with mouth full of food for the young, several times approach his empty-mouthed mate with wings fluttering, then step rapidly to one side as if trying to attract her attention. The female was devoting her energies solely to alarm-cries.

8. A male bird which was near the nest while we were banding the young on their eighth or ninth day, heard a chirp from one of the young and flew in boldly, fluttering about our hands and arms, pecking and chirping. This caused the young to hop off in all directions. Although put back into the nest, they did not stay long.

9. Nestlings received food from both parents direct within a few hours of hatching. Newly hatched young made no sound when begging. Five-days-old nestlings produced a begging sound faintly audible to a human ear about 12 inches away.

10. In each of two nests the down of the last nestling to hatch was of a brighter shade of yellowish buff than that of its day-old siblings.

11. Young birds left the nest on their ninth or tenth day, a day or so before they could fly. When they left the nest they hopped; but they learned to walk and run before learning to fly. Their food-call after leaving the nest was a soft *sweet*. This call they continued to give until at least their sixteenth day. The adult had no similar call.

12. The last full songs of the season we heard on July 12. An incomplete song, heard on July 15, was reported to us.

13. We saw a banded young bird being fed by its parents at least six days after it had left its nest. We also saw a strong-winged banded young bird which had followed its parent or parents at least a half mile from its nest to a flat much frequented by larks all summer.

14. Of seven nests observed, one held five eggs, five held four eggs, and one held three eggs. Of the 28 eggs, we know that 23 hatched and that one did not hatch. (One clutch of four may or may not have hatched.) Of the 23 young, at least nine left the nest in good order.

15. Of the seven nests all but one were warmly lined. The poorly lined nest was also the most exposed to the weather, the greatest in elevation above sea-level, and one of the least successful, for three of the brood perished from starvation or exposure (or both) when about a week old. Another nest, 100% unsuccessful, was probably stepped on by a workman. No nest of the seven was destroyed by a weasel, fox, raven, owl, or other predator.

LITERATURE CITED

- BENT, ARTHUR C.
1942 Life histories of North American flycatchers, larks, swallows, and their allies. U. S. Natl. Mus. Bull. **179**: 320-371, plates 46-53.
- COTTRILLE, BETTY DARLING
1950 Death of a Horned Lark in territorial combat. *Wilson Bulletin*, **62**: 134-135.
- HESS, ISAAC E.
1910 One hundred breeding birds of an Illinois ten-mile radius. *Auk*, **27**: 19-32.
- KUMLIEN, LUDWIG
1879 Contributions to the natural history of Arctic America, etc. U. S. Natl. Mus. Bull. **15**: 69-105 (Birds). Reissued in Smithsonian Misc. Coll., **23** (1882).
- OBERHOLSER, HARRY C.
1902 A review of the larks of the genus *Otocoris*. Proc. U. S. Natl. Mus., **24**: 801-883, 3 maps.
- PICKWELL, GAYLE
1931 The Prairie Horned Lark. *Trans. Acad. Sci. St. Louis*, **27**: 1-153, 34 plates.
- SOPER, J. DEWEY
1928 A faunal investigation of southern Baffin Island. Natl. Mus. Canada (Ottawa) Bull. **53**: 76-116 (Birds).
1940 Local distribution of eastern Canadian arctic birds. *Auk*, **57**: 13-21.
1946 Ornithological results of the Baffin Island expeditions of 1928-29 and 1930-31, together with more recent records. *Auk*, **63**: 1-24, 223-239, 418-427.
- SUTTON, GEORGE MIKSCH
1927 Flocking, mating, and nest-building habits of the Prairie Horned Lark. *Wilson Bulletin*, **39**: 131-141.
1932 The exploration of Southampton Island, Hudson Bay. Mem. Carnegie Mus. (Pittsburgh), **12** (2), sec. 2, The Birds: 1-275.
- TERRILL, L. McI.
1917 Horned Larks in the Province of Quebec (*Otocoris alpestris praticola*). *Wilson Bulletin*, **29**: 130-141.
- WYNNE-EDWARDS, V. C.
1952 Zoology of the Baird expedition (1950). I. The birds observed in central and south-east Baffin Island. *Auk*, **69**: 353-391.
Department of Zoology, University of Oklahoma, Norman, Okla.