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BIOLOGY.—*Biological reconnaissance along the Ahlasuruk River east of Howard Pass, Brooks Range, Alaska, with notes on the avifauna.* LAURENCE IRVING and SIMON PANEAK,¹ Arctic Health Research Center, Anchorage, Alaska. (Communicated by Herbert Friedmann.)

Through Howard Pass in the Brooks Range of Alaska there was once an important Eskimo trade route. Here the Nunamiut Eskimos of the mountains of Arctic Alaska met the people from the upper Kobuk and Noatak Rivers to trade for articles obtained from the people of the western Arctic coast. Usually before the snow melted in spring, parties of Nunamiut families traveled north through the pass along the Etivluk to the Colville River. Here the majority of the parties assembled their skin boats and proceeded eastward to the Colville mouth. Some parties diverged northward to meet the people of the coast near Barrow. The eastbound travelers often went far along the Arctic Alaskan and Canadian coast.

As a young man Paneak traveled these routes, although his usual mountain residence was east of Howard Pass. From his parents he learned about the old traffic which had brought arms, powder, lead, utensils, tools, tea, and tobacco from Russian

traders on the coast. Even the spotted and white skins of Siberian reindeer were handled on this overland route across Alaska, and instances were known in which such skins eventually reached Eskimos east of Aklavik.

Among these people commerce dealt in many articles valued for decorative purposes, and each meeting between Eskimo groups was marked by games, contests, and the intense sociability which associated the scattered Eskimo families and villages in a common pattern of social culture. Their existence, which was at a level far above mere subsistence, required the exercise of great skill in their well-organized hunting. Their travel followed routes along which ancestral knowledge assured them that animals and fuel would be abundant in that season. It was not the policy of Eskimo living to hunt and pursue laboriously but to intercept their needs in the places and at the times when natural products were abundant and suitable for use. In short, they lived by the accurate prediction of natural events based upon cultivated knowledge of natural history. This was made effective by social action and refreshed by constant exchange of information (L. Irving, 1953).

An ancient trade route of hunting people is likely to follow the abundance of the animals upon which they depend. So we had discussed Howard Pass as a locality well situated for biological observation. It traverses the Brooks Range in its west-central part. It leads from near the headwaters of the Alatna River, flowing south-east, and the Kobuk and Noatak Rivers running west over a low watershed to the

¹ We wish to express our thanks to Harry Brown, of Kobuk, for his genial hospitality and for his understanding comments on the people and country. Charles Sheldon, chief of the Kobuk Village Council, gave us pertinent information about birds and geography, which was also extended by numerous others of the sociable Kobukmiut. John Cross, of Wien Airlines, Inc., scheduled and accurately accomplished our flight to and from lake "Itivlik." Dr. Herbert Friedmann verified the identification of specimens and extended the facilities of the division of birds in the U. S. National Museum for the preparation of this report. A grant from the Explorer's Club assisted us to meet costs of transportation.

Place names in quotation marks have been used by Nunamiut and Kobukmiut for many years. Except for an evident relation of some of them to those on Stoney's sketch map, these names do not appear to have been published.

northward flowing Etivluk and so to the upper Colville Valley. The country of the Kobuk, lower Alatna, and lower Noatak is wooded. The mountains and Arctic slope are treeless but with low willows in parts of the valleys. The pass was, accordingly, a route from the northwestern Alaskan forest to the open tundra of the rolling Arctic slope. As it has been a residence for ancient man and a thoroughfare for his travel, it is also a significant channel in the distribution of animals.

We knew the country well around Anaktuvuk Pass, which traverses the center of the Brooks Range. Howard Pass is about 140 miles west of Anaktuvuk and lies about halfway from there to the western Arctic coast. No biologist had recorded observations between Anaktuvuk and the western coast. The region appeared to be strategically located in an area biologically unknown. Because of birds' conspicuous activity and since we had well-organized information about the birds of Anaktuvuk, it appeared likely that we could assess the nesting avifauna during one season. Such observations and comments as we could make upon the people who formerly occupied the region are presented for the assistance of further anthropological investigation.

The mountains of the Brooks Range separate the generally forested interior from the tundra of the Arctic slope along a bend extending from the longitude of Demarcation Point nearly to the western Arctic coast. The midwestern part of the mountains is traversed by a pass at about 2,000 feet elevation. This pass is called Howard Pass after the young naval officer who was the first white man to use it in 1886. He was detached from Lieutenant Stoney's party to travel with the Nunamiut Eskimos on their annual trip from the mountains to the Colville River and Point Barrow (Stoney, 1900).

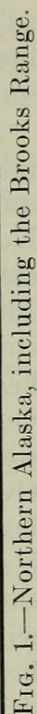
Howard set out with a leisurely traveling group of Eskimo families, which sometimes numbered 100 persons. Occasional congregations described along the route indicate that perhaps several thousand inland Eskimos were then traveling to the northern and eastern Arctic coast after their winter

residence in the mountains. At that time Paneak's parents lived in the mountains to the east, where they were, for the time, accustomed to remain during summer. They had described to him Stoney's visit in 1885 to Chandler Lake and the conditions of those times. The mountain country was then populated by the Nunamiut Eskimos, among whom Paneak is one of the 75 people now living at Anaktuvuk Pass, the only present residents of the Brooks Range. The valleys channeled the wanderings of the caribou and ordered the hunting life of the Nunamiut people (W. Irving, 1953).

A few well-marked passes are significant as routes for birds migrating northward, and many are known by the Nunamiut to nest in the valleys. The lines of bird migration coincide in part with the travels of recent inland Eskimos and of more ancient people who have left evidence of their dwelling in the country. Man, mammals, and birds were distributed through these regions in patterns that are variously related to the terrain. The distribution of birds is easiest to determine.

In the winter of 1943 Paneak had been in Howard Pass with his family, but severe weather restricted his observation. In 1952 Irving spent two days there with President Terris Moore of the University of Alaska at the end of May, making a few observations upon the migration which was in progress. On June 19, 1953, we were landed upon a lake about 2 miles in diameter situated about 20 miles east of the designation of Howard Pass. The lake, called "Itivlik" by the Nunamiut and Kobuk Eskimos, is at latitude 68°8'N., longitude 156°10'W. About its shores we counted 100 sites of ancient dwellings near which numerous artifacts attested a variety of cultural methods among the old residents. The lake was apparently an ancient center, and the present abundance of caribou and fish suggests good reasons for its occupation.

The lake drains northward to a small river 1½ miles away called the Nigu on some maps. This name is unknown to the Eskimos, who call it the "Ahlasuruk." This is a good name, for in Eskimo it means small "Ahlasook" (now named Alatna). It refers to the northwesterly course of the "Ahla-



suruk" as a prolongation of the longer southeasterly course of the Alatna. The "Ahlasuruk" rises about 32 miles east of "Itivlik" and joins the river called Etivluk on the map about 30 miles north by west from the lake. From this point the Etivluk flows to the Colville. Near the source of "Ahlasuruk" the west fork of Killik rises. Somewhat west of the "Ahlasuruk" and Alatna headwaters the Noatak River rises to flow westward, and not far south of the Noatak's head the Kobuk River rises to drain the southern watershed of the Baird Mountains along a westward course. It is the nearby origin of these great radiating river systems which Stoney (1900) remarked to make the region a center of inland Eskimo life and which has undoubtedly also been important in the distribution of animals.

Near the lake the river is at about 2,000 feet elevation, and the valley is about 5 miles wide between contours of 3,000 feet. North and eastward mountains rise to elevations of 5,000 to 6,000 feet. The irregularly sloping valley floor is extensively covered by the sedge clumps called nigger-heads. The general greenness of the low vegetation suggests that the cool wet weather we encountered is characteristic. Over great areas the infrequent willow bushes are restricted to narrow bands rarely higher than 3 feet along small streams. Along the river and some of its larger tributaries willows grow to 15 feet, but many of them bear the marks of the deep hard-winter drifts formed by the violent winds for which the winter climate of the country is noted.

Between June 19 and July 22 we examined the country for a distance of about 3 miles around "Itivlik" Lake and northwesterly along the "Ahlasuruk" for about 8 miles. About 7 linear miles upstream from "Itivlik" are the forks where "Itkilyiargiak" branches eastward. This name means "go to visit the Indians" and may refer to some period in Eskimo history when Indians invaded the tundra.

Along the winding course of the river it had been necessary to haul our small boat by line in the swift shallow gravelly stream. From our camp at this fork we walked up "Itkilyiargiak" and "Ahlasuruk," traveling about 5 miles up the latter to a stream

entering from the northeast on a high gravel fan. Because this elevated course of the stream permits a long view in both directions along "Ahlasuruk," it is called "Inyurak-toat." The hills at the base of the mountains between the two forks are called "Issygok," a name comparable with Stoney's "Isseyhuk."

Our search extended about to the 3,000 feet contour along the northern side of the valley, penetrating short distances into the northern mountains along the narrow valleys of several tributary streams, and occasionally reaching about 4,000 feet elevations.

While the weather was unpleasantly like that of the northern Arctic coast, with frequent and persistent rains and cold overcast, the low temperatures restrained the mosquitoes to only occasional nuisance levels. In the cold weather many caribou moved through the valley. On one day of prolonged observation from the mountains about 10,000 were seen in bands which could be approximately counted. No single direction or systematic course was observed, and they appeared to be moving locally from mountains to valley and back. Few large bulls were seen, and a majority of perhaps 80 per cent of the adult cows in some bands had calves.

Wolves were occasionally seen and two dens were found. One had six pups, and the other, about 8 miles distant, had been abandoned during the night before its discovery, probably from the disturbance caused by our search in the vicinity for fox sparrows and gray-cheeked thrushes. Judging from the tracks there were only two or three pups. Many tracks and signs of grizzly bears were seen. In the sparse willows at the forks near "Issygok" a great abundance of the leguminous "Mashu" promised extensive feeding for bears when the roots should mature. Two wolverines and several sets of their tracks were seen. Ground squirrels were common but restricted by the wet grassy ground to areas of limited extent. The region appears to be productive of large animals. The caribou are known to be commonly abundant throughout the winter and have afforded the sustenance of the few recent Eskimo hunters as well as the once numerous ancient

travelers and residents in that part of the mountains.

Forty-six kinds of birds were listed between June 19 and July 22. All are regarded as nesting birds except the single specimen of Baird's sandpiper. After six years study at Anaktuvuk, 60 birds are listed as nesting there (Irving, 1954). Six kinds missed at "Ahlasuruk" are so well known and conspicuous at Anaktuvuk that our failure to find them is significant. These are: *Totanus flavipes*, *Erolia bairdii*, *Erolia minutilla*, *Ereunetes pusillus*, *Leucosticte tephrocotis tephrocotis*, and *Calcarius pictus*.

All these birds but *Leucosticte* would have been seen in one day's observation at Anaktuvuk even without special familiarity with the region. *Leucosticte* would probably have been seen in three or four hours search of its mountain side habitat at Anaktuvuk. At "Ahlasuruk" we devoted much more time to an unrewarded search in areas which appeared suitable.

The discovery of a red-spotted bluethroat (*Luscinia svecica*) near "Itivlik" lake is not

considered to signify a distinction of the avifauna of the region, for it is a bird seldom reported from only a few localities of Alaska. The abundance of snipe (*Capella gallinago delicata*) and numerous dowitchers (*Limnodromus scolopaceus*) along "Ahlasuruk" is in contrast with the uncommonness of the former and the absence of the latter in nesting season at Anaktuvuk. Difference in numbers observed is not so important a distinction between the two avifaunas as is the difference between common occurrence and no observation in an intensive search.

References to the occurrence of *Totanus*, *Leucosticte*, and *Calcarius pictus* in western arctic Alaska are lacking (Bailey, 1948; Ridgway, 1901, and 1919). The other three kinds have been reported on the wooded Kobuk about 100 miles south of our position (Grinnell, 1900), and *E. bairdii* and *E. pusillus* have been reported on the western Arctic coast of Alaska (Bailey, 1948).

It may be that the results of the survey of the birds in some 300 square miles about the

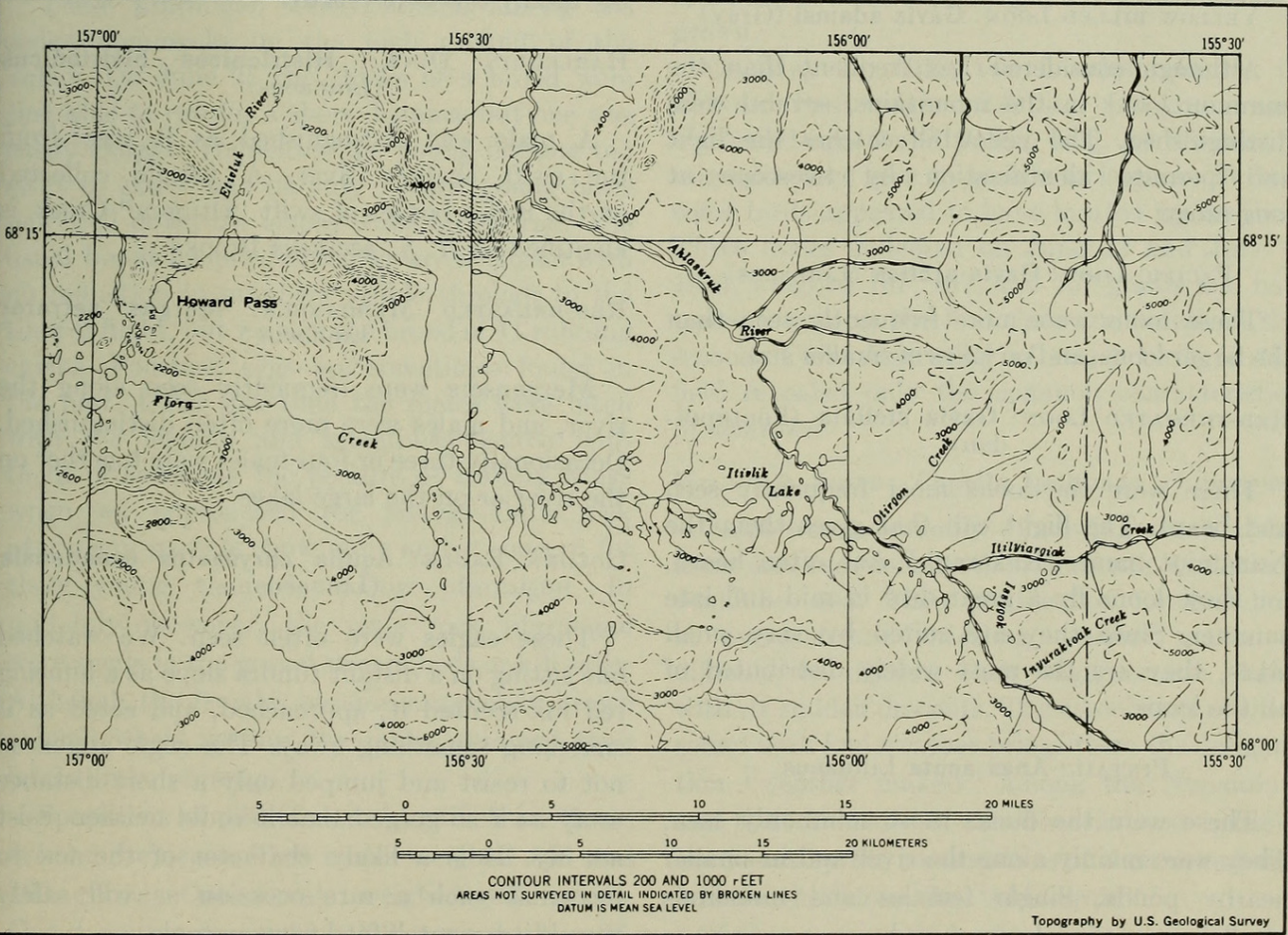


FIG. 2.—The Ahlasuruk River country.

"Ahlasuruk" represent only a local pattern of distribution. On the other hand, it is probable that the absence of these six kinds indicates a step in the diminution of the northwestern migration of birds through America. Only 100 miles of arctic Alaska extend west of "Ahlasuruk." Although some birds migrate from Alaska into Siberia the strong westward current of American bird migration is close to its terminus at Howard Pass. The number of continental American bird species seems to decline in the western part of the Brooks Range.

COMMON LOON: *Gavia immer* (Brünnich)

Of many loons seen two were identified as black-billed, which are generally more frequently seen within the mountains than yellow-billed loons. Both are restricted to lakes large enough to provide room for their laborious take-off from the water, and they are considered by the Nunamiut to resort only to waters producing fish large enough for human food. There are very few lakes in the mountains suitable by these criteria for large loons.

YELLOW-BILLED LOON: *Gavia adamsi* (Gray)

Although considered less frequent than the common loons in the mountains, several were distinguished. The yellowbill catches the light and permits identification by telescope at long range.

PACIFIC LOON: *Gavia arctica* (Linnaeus)

These loons were more frequently seen than the larger loons, and on lakes of smaller size.

RED-THROATED LOON: *Gavia stellata* (Pontoppidan)

These were the loons most frequently seen and heard. The flight call that gives them the Nunamiut name "Kakerauk" was often heard, for these loons fly a great deal in mid and late summer. Since they are suited by very small lakes, they are the most widely distributed of all the loons.

PINTAIL: *Anas acuta* Linnaeus

These were the ducks most commonly seen. They were mainly along the river and in smaller nearby ponds. Single females and numerous small groups of males occurred.

GREEN-WINGED TEAL: *Anas carolinensis* Gmelin

These teals were frequently seen along the river. Most of those observed were males which were often in groups of three or four.

SCAUP DUCKS: *Aythya* sp.

Single female and male scaup ducks were nearly as common as pintails but were mainly present in lakes. Several families of young were seen, and after mid-July males were more often in groups of three or four and on the larger lakes. They are very shy, and in the prevalent overcast no certain distinction could be made between the greater and lesser forms.

OLD SQUAW: *Clangula hyemalis* (Linnaeus)

In some of the small and larger marshy bordered ponds the alighting of a single male often attracted a female from her concealment to swim about with him in apparent domestic association. This was in midsummer when the males of many kinds of ducks keep company only with their own sex. In mid-July a family of young was seen, and subsequently two or three males were occasionally seen together as if the family ties were relaxed.

HARLEQUIN DUCK: *Histrionicus histrionicus* (Linnaeus)

A male was distinguished as it rose from the swift shallow river. A female collected on the rocky border of swift "Otirgon" Creek is identified as *H. h. pacificus* Brooks.

RED-BREASTED Merganser: *Mergus serrator* Linnaeus

Mergansers were frequently seen along the river, and males were more often distinguished. Occasionally three or four males were together on the river or on the large lakes.

GOLDEN EAGLE: *Aquila chrysaetos canadensis* (Linnaeus)

These eagles were often seen. We watched one sitting on a distant tundra slope as a hunting red fox scented it, approached, and acted as if snatching something away. The eagle appeared not to resist and jumped only a short distance away as if so gorged that it could neither resist nor fly. It is a likely character of the fox to recognize such a rare occasion as will safely permit it to snatch food from an eagle.

GYRFALCON: *Falco rusticolus* Linnaeus

In addition to several other observations of gyrfalcons a pair was seen about a nest on a steep cliff. Fresh droppings and old weathered signs indicated that the site was regularly occupied, but no young birds could be distinguished.

WILLOW PTARMIGAN: *Lagopus lagopus* (Linnaeus)

Although females with chicks were less frequently seen than was the case with rock ptarmigan, nesting and summer resident willow ptarmigan appeared more numerous than had been seen in other summers at Anaktuvuk. Unusually large numbers of ptarmigan migrated through Anaktuvuk in the late winter of 1952 and more in 1953. It appears as if they are also abundant in summer in the low parts of the "Ahlasuruk" valley. As the season progressed males were more frequently associated and groups of six were among the willows of the gravelly stream beds commonly in mid-July. Specimens were identified as *L. l. alascensis* Swarth. Two males weighed 523 and 572 grams.

ROCK PTARMIGAN: *Lagopus mutus* (Montin)

These ptarmigan were common among the sedge hummocks on the high ground of the valley. On June 25 the chicks of a brood were just able to run for a short distance but one was easily caught. Thereafter the young became too swift to catch, and on July 7 some young birds flew well down the slopes while others ran. The usual brood included three to seven chicks with no reduction in numbers visible through to the time of flight, but we saw one brood of 11 running chicks. Fourteen eggs are sometimes found in the nest. Until this time the males were often with the females and sometimes shared with them in assuming the posture of trailing wings when we approached the young. Both rock ptarmigan parents show more active concern for their young than do willow ptarmigan. In mid-July, however, the male rock ptarmigan were single in the gravel stream beds or hill sides. Although the females became completely brown colored when nesting the males retained their white under plumage.

Specimens of adults were identified as: *L. m. nelsoni* Stejneger. Two males weighed 503 and 460 grams. One female weighed 427 grams. One downy male weighed 13.3 grams on June 25.

SEMIPALMATED PLOVER: *Charadrius hiaticula* Linnaeus

These plovers were common on the bars of finer-grained gravel along the river and on some broad gravel stretches along tributary streams. Several birds were usually seen in one area, and they were frequently as demonstrative as when the young are near.

AMERICAN GOLDEN PLOVER: *Pluvialis dominica* (P. L. S. Müller)

On the somewhat elevated areas of ground which were usually dry and sparsely vegetated because of their moraine gravel composition a pair of plovers was commonly a feature of the view. They seemed to spend much of their time in statuesque poses alertly surveying the country and ready to call as we came near. Early in the season close approach to a nesting area evoked the posturing of a parent bird which is supposed to distract interest from the nest. This behavior reveals its proximity and simplifies discovery. By July 2 the pinfeathers denoting moult were conspicuous, but the adult pairs remained associated until July 22 when we left the region. In early August the adults become scarce about Anaktuvuk while the young are still incompletely grown.

On May 26, 1952, two females collected in Howard Pass weighed 143 and 149 grams and contained eggs 9 and 10 mm long. At this season migrants were seen in groups as large as 20, but some birds appeared to have located for nesting. Three males collected on June 22 and July 1, 1953, weighed 137, 157, and 157 grams and had testes 9 mm on the first date and small on the second. Careful scrutiny of many birds in the field revealed only the common characteristics of *dominica*.

WILSON'S SNIPE: *Capella gallinago* (Linnaeus)

Snipe were commonly winnowing over marshy areas and occasionally their acrobatic evolutions could be seen. Their predilection for sounding in overcast and drizzling weather makes it difficult to discern their high erratic flight with its sudden descents. The association of their sound with foul weather brings them the designation "weather makers" among the Nunamiut, and their influence in this direction was notably borne out by the commonness of their sound and bad weather along the "Ahlasuruk."

Snipe are regularly heard but rarely seen

in summer at Anaktuvuk, although in 1953 they were heard more frequently than in the five previous years of recorded observation there. The numbers on the "Ahlasuruk" were much greater, as might agree with the more extensive marshy ground. We have not recorded any observation of a snipe seen except in its noisy flight, but nesting is indicated by those which are heard persistently.

WANDERING TATLER: *Heteroscelus incanus*
(Gmelin)

On July 1 a pair of tatlers noisily fussed about us in the gravelly bed of a small stream in its narrow valley among the mountains. Search did not reveal the young suspected of being near. In six years we have only once found downy young tatlers and have no nest to record. The Nunamiut have earlier found eggs on gravel bars, usually on the swift small streams among the mountains. Tatlers were seen at several other similar locations. From one gravel bar a pair took off to follow and apparently harry a short-eared owl out of their domain.

A male and a female specimen weighed 102 and 107 grams.

PECTORAL SANDPIPER: *Erolia melanotos* Vieillot

These sandpipers were frequently seen in flight. At the first part of our visit they were seen singly, later in twos and threes and after mid July in a group of 10. Although their nests have been often seen along the arctic coast we have not recorded any in six years at Anaktuvuk. Along the "Ahlasuruk" the birds were more frequently seen but their nests remained hidden from us.

On May 25 and 26, 1952, in Howard Pass numbers of pectoral sandpipers were seen in migrant flocks of 30 or more and occasionally in groups of two or three. A male specimen collected then weighed 90 grams, and a female collected July 1, 1953, at "Ahlasuruk" weighed 52 grams.

BAIRD'S SANDPIPER: *Erolia bairdii* (Coues)

Only once was this bird seen as it fed desultorily on a mud bar by the river. This is in contrast with their common and widespread distribution as breeding birds in Anaktuvuk. This specimen was a male with testes 3 mm, molted and weighing 34 grams.

DOWITCHER: *Limnodromus scolopaceus* (Say)

About six dowitchers were seen. Most were in flight but two flew about over marshy-bordered ponds, frequently alighting. In six years at

Anaktuvuk we have no recorded observation of a summer dowitcher although the Nunamiut think that they sometimes nest in the mountains during summer. They are common migrants for a brief spring period at Anaktuvuk. On May 25, 1952, a few migrants were seen along the Noatak River about 15 miles south of Howard Pass. A male was collected there and two were collected on the "Ahlasuruk," the latter weighing 90 and 100 grams.

NORTHERN PHALAROPE: *Lobipes lobatus*
(Linnaeus)

These phalaropes were frequently seen around the grassy bordered ponds and pools. Often one or two would be floating quietly with head erect and alert or feeding. More often later in the season many might be darting about like swallows over a small lake but occasionally settling on the water. Their restless flight activity increased rapidly as the season progressed and by mid July it was often intense. They then frequently associated briefly in flocks of a dozen. At this time it is doubtful if the young were flying freely, for in Anaktuvuk nests with only slightly incubated eggs were found on June 22.

PARASITIC JAEGER: *Stercorarius parasiticus*
(Linnaeus)

These jaegers were numerous and hunted diligently, often in pairs. On only one occasion was a dark-phased bird seen. It was in company with a light bird and landed frequently about a marshy area as if it were a nesting site. Two dove repeatedly at the place where a rock ptarmigan with her brood had just passed over a knoll, but the jaegers did not quite reach ground and caught nothing. We could not see how the mother operated her system of defense on this bare ground against these vigorous predators.

LONG-TAILED JAEGER: *Stercorarius longicaudus*
Vieillot

On June 20 six of these jaegers were standing on the ice of "Itivilik" Lake just before it went out. All were light-phase birds, as were all the many others seen. They were several times more numerous than parasitic jaegers and readily came to swoop persistently close to our heads when we invaded their territory.

GLAUCOUS GULL: *Larus hyperboreus* Gunnerus

These gulls were more numerous than in summer at Anaktuvuk. The central points for a pair seemed to be 2 or 3 miles apart along the

river. Usually wary, at two places one persistently hovered calling close above us.

SHORT-BILLED GULL: *Larus canus brachyrhynchus*
Richardson

These gulls were more numerous and less wary than glaucous gulls, frequently diverting their line of flight to pass over and examine us. Their calls are soft and pleasant. Altogether they are friendly birds for gulls.

ARCTIC TERN: *Sterna pardisaea* Pontoppidan

Terns were frequently seen flying or fishing along the river and at some of the lakes. Usually two or a few operated together and on July 2 about 12 persistently fished one small lake. As they departed in the evening 10 were observed together flying down the river. We did not see their nesting place but from the course of their flights believe that their nests were located down river, where the gravel bars are more extensive.

SHORT-EARED OWL: *Asio flammeus flammeus*
(Pontoppidan)

Occasionally an owl was seen erratically flying over the tundra often descending to just above the sedge tips. Here as elsewhere they are often pursued by small birds.

PALLID HORNE LARK: *Eremophila alpestris*
(Linnaeus)

Larks were seen on many higher and dry areas. By July 2 young birds were flying and their trend with the old birds was SE along the base of the mountains. Early arrivals, they are one of the earliest to depart. A male and a female specimen are identified as *E. a. arctica* (Oberholser).

RAVEN: *Corvus corax* Linnaeus

A few ravens were seen but usually singly and not so often as might be expected when caribou were so numerous that the remains of those that perished afforded good feed for ravens. Ravens seem to gather about mountains with high steep cliffs, which are uncommon near "Ahlasuruk."

EASTERN ROBIN: *Turdus migratorius* Linnaeus

Robins were seen on the Noatak River and in Howard Pass on May 25 and 26, 1952. Along the "Ahlasuruk" they were frequently seen late in June, and after July 1 nests of this year were found empty in many patches of willows. On July 11 a young male was collected flying well

and weighing 70 grams, which is within 10 grams of the average adult weight in summer. During this season the young birds were with their noisily solicitous parents. On July 12 a bird was flushed from a nest containing three clean surfaced and apparently fresh eggs. With the rapid development of young robins these could hatch and reach the size of the young male which was collected in about five weeks, and become strong flying birds by the end of August. Robins are still common at Anaktuvuk early in September and appear to leave the mountains in numbers in the second week. There was thus a good prospect for this late brood to be ready to migrate. A young male was identified as *T. m. migratorius* (Linnaeus).

GRAY-CHEEKED THRUSH: *Hylocichla minima*
(Lafresnaye)

These thrushes were frequently seen and heard among the thick willows. At this season they were so shy and secretive that none could be obtained for identification.

WHEATEAR: *Oenanthe oenanthe* (Linnaeus)

Wheatears were frequently seen along the base of the mountains and upward over the lower rock slides. On July 8 young birds were flying and one collected had adult weight but not full length of tail. After the young wheatears fly the restless shy behavior of the adults changes to calm and after mid July the birds come down to lower ground where they show little apprehensiveness. Their deportment on the "Ahlasuruk" agreed with that observed in Anaktuvuk. An adult male weighing 25 grams and the young male weighing 25 grams on July 8 are identified as *O. o. oenanthe* (Linnaeus).

RED-SPOTTED BLUETHROAT: *Luscinia svecica*
(Linnaeus)

A small bird with dark grayish back and fox-colored rump and outer tail feathers flew from some thick low willows near "Itivlik" to a nearby sedge clump and moved swiftly about in wren like posture. When it returned a second time it was collected; it weighed 20 grams and was identified as a female *L. s. awatcha* (Gmelin). The eggs measured 2 mm, and the bare breast indicated its brooding condition. We had not recorded the bluethroat from Anaktuvuk, nor was it known among the Nunamiut. Its appearance is so distinctive that it would have been remarked upon if observed. It is difficult to

distinguish retiring birds in cover, but the close observation of the country and the unusualness of the bird's appearance make us believe that bluethroats are as rare in the interior as the few authenticated reports indicate.

WILLOW WARBLER: *Phylloscopus borealis*
(Blasius)

Among the low willows along a small stream and within 200 yards of "Itivlik" Lake five pairs of willow warblers were located by the singing of the male and the occasional appearance nearby of the female. Along the "Ahlasuruk" about a dozen pairs were located by song and appearance among willows. When wind moves the willow leaves these small warblers are not easy to see, for although not shy they move swiftly. They appeared to be as common as in similar situations in Anaktuvuk. The historic Nunamiut familiarity with these birds is shown by the fact that they have an explicit name (L. Irving, 1953). A female with bare breast and weighing 10 grams was identified as *P. b. kennicotti* (Baird).

YELLOW WAGTAIL: *Motacilla flava* Linnaeus

Wagtails were as conspicuous and common on the "Ahlasuruk" as at Anaktuvuk. They remained active throughout our stay, whereas many birds became very secretive in July. One male specimen was identified as *M. f. tschutschensis* (Gmelin).

WATER PIPIT: *Anthus spinoletta* (Linnaeus)

Pipits were common on the grassy bases of the mountains and higher on the rock slides. On July 2 some young birds were just flying, and on July 7 many pipits were seen rather closely associated in contrast to their earlier appearance as individuals. Two female specimens each weighed 19 grams and were identified as *A. s. rubescens* (Tunstall). On July 1 the breasts of the two females were in bare brooding condition.

GREAT SHRIKE: *Lanius excubitor* Linnaeus

Shrikes were frequently seen among the willows. Only once at "Ahlasuruk" was their pursuit observed. The trial was brief for the redpoll easily escaped from a pair of shrikes by its ability to ascend rapidly. Several times redpolls and tree sparrows appeared undisturbed by the near proximity of shrikes. The Nunamiut say that shrikes act inoffensively until, its suspicions lulled, a victim can be suddenly and

easily captured. The usual appearance of these arctic shrikes is in conformity with the story, for we have seen a number of unsuccessful pursuits which have given no high opinion of the shrikes' flying ability for overt attack.

PILEOLATED WARBLER: *Wilsonia pusilla* (Wilson)

While we were watching through the night for wolf pups to emerge from a den, at 3 a.m. a pileolated warbler took position on a willow nearby, sang twice and flew down to the low brush. We continued to watch in this region until an adult wolf returned to the den at 8 a.m., and we searched while camped in the vicinity for four days without seeing the warbler again. The brief view at this season was characteristic of a nesting bird. In Anaktuvuk we have taken one specimen and have no other sight identification. The specimen bird had been singing at the same place on two days. We have many times briefly seen and had reports of yellow warblers which were not distinguishable from willow warblers except that the birds appeared too yellow. We suspect that *Wilsonia* nests at Anaktuvuk. In the same terms we may suspect that one clear view of it at "Ahlasuruk" supports the view that it nests there.

HOARY REDPOLL: *Acanthis hornemanni* (Holboell)

Redpolls of the two forms are the third most numerous kinds of bird seen on the "Ahlasuruk." We have yet to establish a distinction in habitat or behavior of the two redpolls which are so common in arctic Alaska. Part of the uncertainty rests upon the difficulty of sure identification in the field, although we regularly come out with a distinction of two forms by comparing the specimens. Our field reports at "Ahlasuruk" as at Anaktuvuk indicate a preponderance of hoary redpolls in a ratio of 5 to 1 or more. The two kinds are often taken from the same group in summer, but we are not sure that these represent flock associations or the proximity occasionally inevitable for birds which are so numerous and alike in habit. We expected and found *hornemanni* in greater proportions on the open hillsides than in the willows, but the difference is not numerically determined. At Anaktuvuk we can not distinguish between the nests without the adult birds. We did not find occupied nests on the "Ahlasuruk." One specimen of *hornemanni* had her breast bare as for brooding. The two males had large (7 mm) testes on

June 24. At the end of June a group of a dozen redpolls flew together as a flock and such groups were more often seen in July. The inclination for flock association begins to appear very soon after redpolls have nested. Two males and one female specimens weighed 12, 12, and 13 grams and were identified as *A. h. exilipes* (Coues).

COMMON REDPOLL: *Acanthis flammea* (Linnaeus)

Many redpolls of this form were seen on the "Ahlasuruk." A male on June 24 had large (7 mm) testes; in one on July 5 they were somewhat smaller (5 mm). A female on June 23 had evidently laid and contained eggs only 2 mm long. The three weighed 14, 15, and 16 grams, which are among the heaviest redpolls we have found. At Anaktuvuk there is no distinction in weight of individuals in large series of the two redpolls. The three specimens were identified as *A. f. flammea* (Linnaeus).

SAVANNAH SPARROW: *Passerculus sandwichensis* (Gmelin)

Savannah sparrows were common in marshy places along the "Ahlasuruk." On July 2 they were carrying food, but the young birds were not seen. A week later the young were seen flying. Three single individuals were seen May 25, 1952, in Howard Pass. A male specimen taken July 2, 1953, had testes 11 mm in length, weighed 20 grams, and was identified as *P. s. anthinus* (Bonaparte).

TREE SPARROW: *Spizella arborea* (Wilson)

Tree sparrows were less numerous than Alaska longspurs and more numerous than redpolls. They keep to the proximity of willow but even an occasional small bush seems to suit them. Young birds were just flying on July 2, and on July 7 they flew well.

WHITE-CROWNED SPARROW: *Zonotrichia leucophrys* (Forster)

These sparrows were numerous in the willows on the valley floor and in many small patches 500 feet higher in the mountains. They were seen along the Noatak May 25, 1953. On July 2 young birds were first seen just able to fly but the males frequently sang after that date and the family groups were associated in mid July.

One male specimen was identified as *Z. l. gambeli* (Nuttall).

FOX SPARROW: *Passerella iliaca* (Merrem)

Fox sparrows were seen and heard singing along "Otirgon" Creek among thick willow brush where the gray-cheeked thrush were found. They emerged only briefly from dense cover.

ALASKA LONGSPUR: *Calcarius lapponicus* (Linnaeus)

At times longspurs were estimated to be 100 times as numerous as any other bird seen. In June they were in every situation in the valley but most numerous over the great extent of niggerhead terrain. After 10 o'clock in the evening some were still moving about. On July 2 the young birds were first flying and the male adults had started to moult. Soon afterward the young birds flew well, became independent and the adults grew more retiring. They do not thereafter appear more numerous than the Tree Sparrows. On May 25 and 26, 1952, great numbers of migrant longspurs were in Howard Pass and a female specimen was identified as *C. l. alascensis* Ridgway.

SNOW BUNTING: *Plectrophenax nivalis* (Linnaeus)

A few snow bunting were in Howard Pass on May 25 and 26, 1952. These were evidently late migrants for none were seen in summer. A male and female specimen were identified as *P. n. nivalis* (Linnaeus).

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