

MAP OF ALASKA AND ADJACENT PARTS OF CANADA.

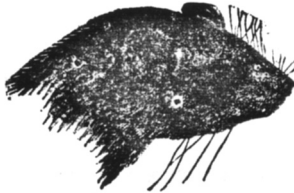
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U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF BIOLOGICAL SURVEY

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BIOLOGICAL INVESTIGATIONS IN ALASKA AND YUKON TERRITORY

- I. EAST CENTRAL ALASKA
- II. THE OGILVIE RANGE, YUKON
- III. THE MACMILLAN RIVER, YUKON

BY

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF BIOLOGICAL SURVEY,
Washington, D. C., June 2, 1909.

SIR: I have the honor to submit herewith for publication as North American Fauna No. 30 a report on biological investigations made in the interior of Alaska and the Yukon territory in 1903 and 1904 by Wilfred H. Osgood. It consists of separate reports on three distinct areas, the close relationships of which from a biological standpoint make it desirable to publish them together. The physiography of these areas is described, and detailed accounts are given of the animal life of the region, especially the abundance, ranges, and general habits of the game and fur-bearing animals. Among the present assets of the territory game and fur-bearing animals occupy a prominent place. Under proper regulations the fur bearers should increase, and the game animals of Alaska should continue indefinitely a source of food and profit to the territory.

Respectfully,

C. HART MERRIAM,
Chief, Biological Survey.

Hon. JAMES WILSON,
Secretary of Agriculture.

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BIOLOGICAL INVESTIGATIONS IN ALASKA AND YUKON TERRITORY.

I. EAST CENTRAL ALASKA.

INTRODUCTION.

The principal work of the Biological Survey in Alaska in 1903 was done along the middle Yukon River between Eagle and Circle and in the mountains west of Eagle near the sources of Mission Creek. For convenience, this region is designated "East Central Alaska." With N. Hollister, of the Biological Survey, as my colleague for the season, I entered the Yukon region via Lynn Canal and White Pass, and reached Eagle June 16, this being the date of the arrival of the first through steamboat of the season. A small rowboat was secured immediately, and the next day we started down the river from Eagle. Several camps were made along the river between Eagle and Circle, the most important being near the mouth of a stream called Charlie Creek, and one about 20 miles above Circle. Circle was reached July 5, and since no steamboat arrived to take us back to Eagle until July 23, we worked in the vicinity of Circle until that time. We returned to Eagle July 25, and, after some delay in securing pack horses, started July 29 for Glacier Mountain, at the head of Seward Creek, a tributary of Mission Creek. Camp was made July 31 at timberline on Seward Creek, immediately under the brow of Glacier Mountain. This being a typical mountain region, and the first in the interior of Alaska to be visited by naturalists, it was decided to devote considerable time to the vicinity. Accordingly the entire month of August was spent at this camp and in the surrounding country. Camp was struck September 3 and the work in this part of Alaska closed. September 8 we left Eagle and returned to the coast via White Pass.

GENERAL ACCOUNT.

YUKON RIVER, EAGLE TO CIRCLE.

The distance from Eagle to Circle via the Yukon is about 125 miles. For the greater part of the way the river flows with a strong, even current of from 4 to 6 miles per hour, winding from side to side, and usually having high bluff-like or mountainous banks on the long

sides of the curves and low flats on the short sides. Throughout the distance, however, the right bank is more mountainous and is characterized by many rocky bluffs, while the left bank is lower and more generally flat and swampy, with low benches and hills a short distance back. Exposed rocky bluffs are interspersed at short intervals nearly all the way from Eagle to the beginning of the Yukon Flats, about 4 miles above Circle. They consist of crumbling rock, rising abruptly from the river or sloping back in series of ragged pinnacles or conical caps surrounded by green forest. At other places the exposures of rock are slight, but the soil is unproductive and vegetation is limited to a few hardy grasses and shrubs, so at a short distance the slopes appear quite barren.

The low banks are fairly well wooded, but their most common condition is what may be called semitundra—a line of fair-sized trees bordering the river, and inland on more or less level ground moss and small shrubs, with a few scattered trees and many small ponds. A few islands appear here and there, becoming larger and more numerous as Circle is approached. They are flat and heavily timbered and rarely more than a mile in length. In many places the banks of these islands have been undermined by the rapidly shifting current, and hundreds of green trees may be seen prostrate in the water with their branches swishing in the current. The falling of these undermined banks and the trees upon them had occasioned the destruction of many nests of birds and small mammals.

Several medium-sized tributaries enter the Yukon between Eagle and Circle, but small creeks or brooks appear to be rare, at least in midsummer. The most important streams entering from the southwest are Seventy Mile Creek and Charlie River. Those that come from the northeast are known on maps as the Tatonduc, Tahkondit, and Kandik rivers, respectively, but these names are practically unknown locally, the Tatonduc being known as Sheep Creek, the Tahkandit as Nation Creek, and the Kandik as Charlie Creek, the last being distinguished from the stream which enters on the other side a short distance below by the name creek instead of river.

The region as a whole is not heavily timbered, and deciduous trees greatly outnumber the conifers. The most abundant trees are poplars (*P. tremuloides* and *P. balsamifera*). The white and black spruces (*Picea canadensis* and *P. mariana*) occur, but neither attains large size, usually being from 6 to 10 inches in diameter. They grow in small clumps on the central parts of the islands, in protected places on the hillsides, in long fringes on the low banks of the river, and rather scatteringly throughout the more or less level country. The paper birch (*Betula alaskana*) is mixed with the poplars, but is neither large nor abundant. The dwarf juniper (*Juniperus nana*) is common in dry gulches and occasionally occurs on open hillsides.

Other woody plants worthy of mention are as follows: Alders (*Alnus*): Very abundant, chiefly in damp situations on level or nearly level ground; sometimes in dense and very extensive thickets growing in swamps to the exclusion of almost all other trees and shrubs. Willows (*Salix*): Several species occur, mostly about the borders of the islands and wherever the river banks are low and sandy. In July many were covered with ripe catkins, from which seeds were blown by every current of air. Dwarf birch (*Betula glandulosa*): Very abundant in damp situations where semitundra conditions prevail. Buffalo berry (*Lepargyrea canadensis*): Found sparingly all along the route. High-bush cranberry (*Viburnum pauciflorum*): Quite abundant in many localities; in full bloom about July 1. Wild rose (*Rosa acicularis*): Very common, particularly on comparatively dry ground near the edge of spruce woods; blooming profusely early in July. Arctic sagebrush (*Artemisia frigida*): Abundant on dry sandy hillsides with southern exposure, where it grows to the exclusion of almost all other plants. Labrador tea (*Ledum*): Rampant in suitable places, always so in semitundra, and very conspicuous on account of its striking starry white flowers. Dwarf laurel (*Kalmia glauca*): Abundant in swamps. Andromeda (*Andromeda*): Occasionally found in swamps in great abundance. Bearberry (*Arctostaphylos uvaursi*): Fairly common, but much scattered.

GLACIER MOUNTAIN.

Glacier Mountain is an elongated, rocky, and somewhat isolated peak lying about 15 miles in air-line distance due west from Eagle. By a rough trail which we followed along the south side of Mission Creek, crossing successively the smaller streams, American, Wolf, and Colorado creeks, and thence up Seward to its source at the east base of the mountain, the distance may be between 30 and 40 miles. From Eagle to American Creek the country is comparatively dry, the ground hard, and occupied chiefly by poplars, through which travel is easy. From American to Colorado, along the south side of Mission Creek, is a gentle and rather swampy slope toward the creek. The ground is thickly covered with wet moss and a dense growth of small black spruce (*Picea mariana*), making travel with horses rather difficult, particularly during a wet season. Occasional knolls of higher ground clothed with poplar and birch are more free from moisture, but these are offset by nearly level swamps almost without timber and covered with the well-known bunches of grass and other low vegetation known locally as 'niggerheads,' through which horses and men flounder with great difficulty. This low country does not extend beyond the mouth of Colorado Creek, however, and thenceforward Mission Creek is bounded on both sides by rather steep, well-

timbered mountains. From the mouth of Colorado Creek, Glacier Mountain may be reached by a direct route up the steep side of one of these mountains and thence along the top of the ridge stretching on the north side of Seward Creek; or, when the water is not high, horses may be taken up the bed of Mission Creek to the mouth of Seward and thence at least halfway up Seward; from there impassable gulches make it necessary to ascend to the top of one of the

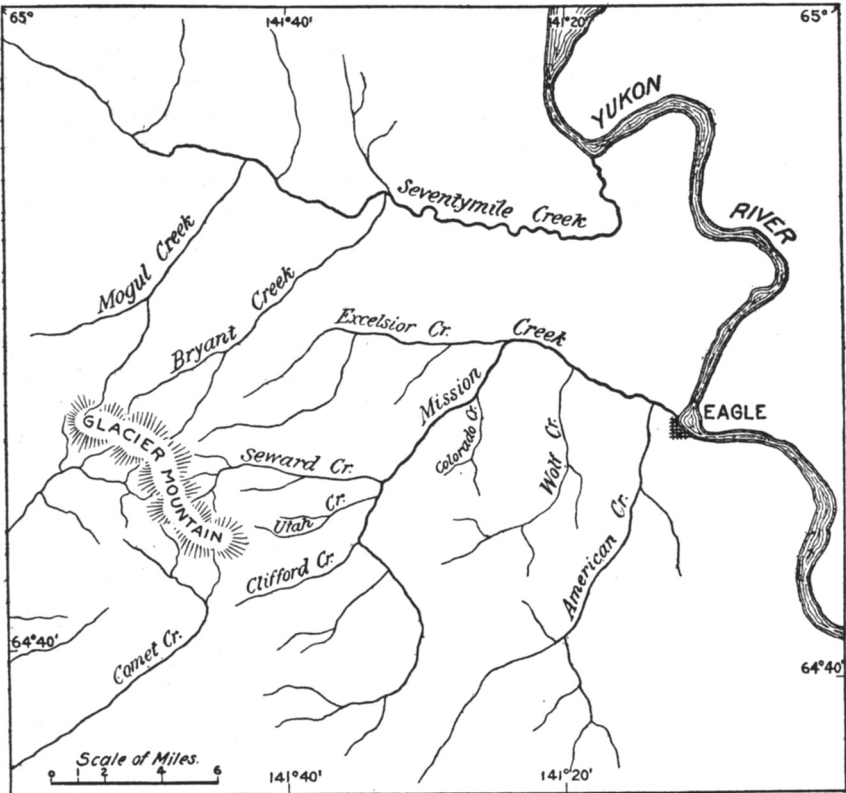


FIG. 1.—Map of Glacier Mountain and vicinity of Eagle, Alaska.

ridges and follow on to come down into the basins at the head of the creek.

Glacier Mountain is in the center of a considerable drainage system, contributing to the three principal streams of the region, Fortymile, Seventymile, and Mission creeks. Trickling streams emanating from small snowbanks on its sides flow in various directions to add to the volume of these three important tributaries of the Yukon. On the east Excelsior, Seward, and Utah creeks flow into Mission Creek; on the north are Bryant and Mogul creeks, both flowing into Seventymile; and on the south and west Comet Creek and others start toward Fortymile. The mountain itself is a mass of granite

stretching northeast by southwest for some 4 miles, with a general elevation above sea level of from 5,000 to 6,000 feet. On the east side is a smaller mass or spur scarcely distinct from the main body, being separated only by a narrow pass but little lower than the rest. The main ridge is narrow and broken into jagged pinnacles, on each side of which the declivities are very steep and covered with broken granite. At the ends, the top of the mountain is wider, with more or less level areas strewn with huge blocks of granite. The southern spur also is rather broad, and, although very irregular, not distinctly ridged nor pinnaced on top. Below these rocky masses are mountain basins or meadows traversed by small streams, which rapidly gain in volume as they descend into the timbered region. Timber of fair size straggles up southern slopes to an altitude approximating 3,000 feet. Along the streams at 2,000 feet to 3,000 feet it is scattered in clumps, and is more or less well grown according as soil and exposure are favorable or not. Long, gently sloping ridges, with broad saddles alternating with rounded domes, stretch away from the main mountains and bound the canyons of the principal streams. These ridges for several miles from the mountain maintain an elevation of 3,000 feet or more, and are mostly treeless. They are well grown, however, to moss, grasses, and small shrubs. By means of these ridges it is possible to travel for quite long distances with considerable ease.

The trees, shrubs, and general plant life are much the same as throughout the Hudsonian and Arctic-Alpine zones elsewhere in the northwest. Among those worthy of mention are the following:

Picea canadensis (*White Spruce*).—The most abundant conifer; occurs in scattered clumps near timberline and in more or less continuous forest on the lower slopes of the mountain and on comparatively dry ground lower down. The trees along Mission Creek are not very large, being about 8 inches in diameter and from 30 to 50 feet high. A few groves of larger ones were seen on Comet Creek, some being 18 inches or more in diameter and about 60 feet high.

Picea mariana (*Black Spruce*).—Common in moist places on high exposed ridges and saddles, as well as in swampy flats lower down.

Populus tremuloides (*Aspen*).—Common on dry knolls and low ridges near Eagle and scattering along Mission and Seward creeks.

Populus balsamifera (*Balsam Poplar*).—Common, probably more so than *P. tremuloides*. In many places along Mission Creek it stands in large groves, many trees of which are 60 to 70 feet high. It is cut for fuel in considerable quantities wherever easily accessible, being preferred to the other timber of the region.

Salix (*Willow*).—Several undetermined species of willow occur along the streams. The two species following grow above timberline: *Salix reticulata* (*Net-veined Willow*).—Found sparingly in the matted vegetation high above timberline. *Salix phlebophylla*.—One small

colony of several plants was observed on a rocky flat near Glacier Mountain. Specimens were preserved, and have been identified by Frederick V. Coville.

Alnus sinuata (Alder).—Much less common than in mountains near Cook Inlet and other points on the Alaska coast. It does not form extensive thickets on the open mountain sides nor even in the draws above timberline, but is confined chiefly to the borders of streams below timberline.

Betula alaskana (Paper Birch).—Along Mission Creek beautiful groves of birch are frequently seen. In such places there is little underbrush, and the ground is covered luxuriantly with grass (*Agrostis*). A few birches are scattered indiscriminately throughout the spruce forest. Along Seward Creek a few small trees occur not far below timberline.

Betula glandulosa (Dwarf Birch).—Excessively abundant; by far the most common shrub on the upper slopes of the mountains, chiefly above timberline, in many places growing in thickets covering 5 to 10 acres. According to situation and possibly soil, these thickets may be of very low almost prostrate shrubs not exceeding 8 inches in height, or they may be good-sized bushes 2 to 4 feet high.

Empetrum nigrum (Crowberry).—Common, but not growing in great masses to the exclusion of other plants, as is often the case.

Lepargyrea canadensis (Buffalo Berry).—Grows sparingly in the vicinity of Eagle and for a short distance up Mission Creek.

Ledum ——— (Labrador Tea).—Abundant, but not in large uniform patches except in swampy flats near the Yukon.

Cassiope tetragona (Four-angled Cassiope).—Very common, growing in large quantities on rocky hillsides in all the available soil among the rocks.

Arctous alpina (Alpine Bearberry).—Very abundant.

Vaccinium vitisidaea (Mountain Cranberry).—Very abundant.

Vaccinium.—Several species not identified are common.

Chamaecistus procumbens (Trailing Azalea).—Fairly common.

Viburnum pauciflorum (High-bush Cranberry).—Common locally throughout the region from the Yukon nearly to timberline.

Ribes triste (Red Currant).—Common along streams and in shady gulches; grows along Mission Creek and up Seward Creek to timberline.

Rosa acicularis (Wild Rose).—Abundant.

Rubus chamaemorus (Salmon Berry).—Very abundant.

Rubus strigosus (Red Raspberry).—One small patch noted near junction of Colorado and Mission creeks.

Spiraea betulaeifolia (Birch-leaved Spiraea).—Scatteringly distributed on the mountain sides near Seward Creek.

MAMMALS OF EAST CENTRAL ALASKA.**Rangifer arcticus stonei** Allen. Stone Caribou.

Large numbers of caribou range over the region south and west of the Yukon in east central Alaska. Roughly speaking, the area frequented by them includes practically all the mountains and much of the lower ground between the Yukon and the Tanana and between Fortymile and Birch creeks. Within these limits a very large herd is seen almost every year. It seems likely that this herd is recruited from various parts of the area. Its former range was probably much wider, and its present one may extend far beyond these limits, as most of the region is uninhabited and definite information is difficult to obtain. It is particularly hard to learn whether or not its range overlaps that of some other herd. To the southward it may reach to the drainage of the Sushitna, where caribou are known to occur, and thence to the Kenai Peninsula. At present caribou cross the Yukon very rarely on account of the amount of traffic there, but in former times large numbers did so, possibly the entire fall herd.^a As recently as September, 1900, a caribou, swimming in the Yukon about 3 miles below the Alaska-Canada boundary, was killed by James Hudson, of Eagle. The older Indians say the old crossing was near this place.

Doubtless the present herds are comparatively small, but they are still large enough to be well worth seeing. The main herd does not assemble until late in September and October, and it was not our privilege to see it; but the scattering bands which in August passed near our camp on Seward Creek caused us to give a large measure of credence to reports of the size of the main herd. If the most conservative reports be reduced 50 per cent, it is safe to say that single herds of as many as 3,000 caribou have been seen in the region between the Yukon and the Ketchumstock Hills more than once since 1900. Local hunters and prospectors who have seen the large herd have seldom tried to estimate carefully its numbers. They report simply that the hills were fairly covered with caribou as far as the eye could distinguish. In the latter part of August, 1903, a herd estimated to contain about 3,000 was seen by several different parties in the vicinity of the Goodpasture River, a tributary of the Tanana.

In spring and summer the animals are scattered in bands of from 2 to 20, while many of the old bulls wander entirely alone. Many of these small herds appear to be isolated and widely separated, while others seem to circulate within a limited area, keeping only a few miles apart throughout the summer. Thus, during the summer of 1903, according to report, small bands were scattered over a large

^a According to newspaper reports, immense numbers crossed near the mouth of the Tanana in the winter of 1907-8.

area about the head of Goodpasture River, and parties camped there were always able to find some of them within a few hours' walk. The Ketchumstock Hills also are said to be much frequented by them in spring and summer. A general movement, involving all or nearly all the caribou of the region, undoubtedly takes place every fall. Just how far this movement partakes of the character of a migration, rather than a wandering, is difficult to determine. Apparently the animals do not entirely forsake their summer range in the fall, but regularly enter certain areas also which they visit rarely or not at all in summer. The small bands seen by us were mostly moving northerly, and though individuals remained in the vicinity for several days, the vast majority kept moving forward in a definite manner. Although a few appeared to come into our vicinity from the north, they departed in the same direction, or at least were not observed to go out to the south. Practically all of them came up from Comet Creek, crossed the divide to the basin at the head of Seward, and then worked out toward Excelsior, Bryant, and Mogul creeks. Nevertheless, only a short distance north of us, caribou in numbers were seen two weeks earlier than any appeared in our vicinity. Mr. L. M. Prindle informs me that his party of the United States Geological Survey noted a few caribou near the head of Mogul Creek August 3; August 13 they saw about 40 on the upper part of Seventymile, the next day many, and thence to Birch Creek caribou were abundant all the way.

At our camp on Seward Creek the first to appear were in twos and threes on August 18. On that day we saw about 40. These may have wandered back from the herds seen earlier to the northward by Prindle or, as is perhaps more probable, they may have been on their way from the south to join those herds. August 19 we made no effort to look for more caribou, since the weather was bad and we were occupied in preparing the animals killed on the previous day, but our camp man, while wandering in a heavy fog, encountered a herd of 28. On the 20th heavy rain and bad weather continued, and we remained in camp at work on caribou skins, but during the day two herds of about 15 each, apparently oblivious of us, crossed about 75 yards from the tent, which was within sight, although pitched in a clump of timberline trees. These herds came apparently from Utah Creek, and first appeared on a low ridge opposite camp, whence they descended, forded the swollen creek, and went on up the ridges to the northward, keeping closely bunched and jostling each other in brushy places, the heads and necks of those in the rear often extending over the hind quarters of those in front. The herds included both sexes and various ages, but, though some of the bulls carried fair heads, no very large ones were noted. Leadership was not particularly evident in any of the herds, but most frequently old cows were seen in advance. August

21 the largest single herd observed, numbering about 50 head, appeared on the slope a half mile northwest from camp, and during the day scattered individuals were seen on various parts of the amphitheater of mountain slopes surrounding us. On the 22d several bands, aggregating about 50 animals, were seen near camp. On the 23d a trip was made to some small basins on the side of Glacier Mountain, but no caribou were observed, and we thought the movement in our vicinity had ceased; but on the day following, while hunting sheep in the highest parts of Glacier Mountain and its spurs, we saw more. Once, at a very high elevation, a solitary young bull was surprised in a little grassy pocket, where he was quietly resting. Later, from a high peak, a view was obtained across a big basin, and two bands of caribou of 6 and 13, respectively, were seen to come up to a low saddle, in which were lying several carcasses, on winding which they ran wildly away. On the next day, the 25th, in the course of a long trip down Comet Creek to timber, 64 caribou were noted, including one band of 28. Thus within eight days we saw approximately 300 caribou, practically all of which passed within sight of our camp.

Our experience indicates that caribou are not keen sighted, but are warned of danger almost entirely by scent. At least they seldom notice a man, and when they do the sight seems to have no terrors for them. This was corroborated almost daily. In hunting up wind, if one moved slowly, but little effort at concealment was necessary for a successful stalk. On one occasion two of us were crossing the divide between Seward and Comet creeks when we saw a good-sized band of caribou coming with the wind up Comet Creek toward us. The region was entirely above timberline and absolutely open. As the caribou were some distance below, we sat down and ate lunch while waiting for them. They came up slowly, feeding and leisurely weaving about, and passed us at a distance of about 75 yards. When opposite, a few turned their heads to look at us, but soon resumed their course unconcernedly. Among them were many cows with calves, the actions of the latter reminding us very much of domestic calves, especially the vigor and gusto they displayed in assaulting the maternal font. Their serenity was suddenly broken, however, when they had proceeded far enough beyond to catch our wind. Up went their heads and away they ran over the nearest ridge.

At another time, seeing a small band directly approaching us, we concealed ourselves behind a bowlder, and in a few minutes caribou were all around us, many of them not 20 feet away. Just as they arrived, however, we sighted some sheep on a near-by cliff, and as these were more important game we jumped up and hurried through the startled caribou. But they ran only to the top of the nearest

ridge, where they turned and watched us. An hour or two later, when we returned, they were still within a quarter of a mile of the place where we met them.

Four young bulls paid us a visit on a high divide one evening in late twilight as we were skinning a caribou killed that day. They came up rather gingerly, sniffing and sidestepping until within about 50 yards, when they set their fore legs and stood in a row looking at us. Then they wheeled and started to run by, but encountered the scent of another carcass, and with a few wild snorts dashed out of sight in the opposite direction. Soon they appeared again, and we shouted at them, but this seemed only to increase their curiosity, and they remained in the vicinity for some time. Three men at work on a carcass in semidarkness must have presented an unusual sight, and if we looked as grotesque to the caribou as they did to us, their curiosity was justified.

From August 26 to September 3, when we broke camp, we saw no more caribou, but a few still remained in the vicinity, as we learned from other sources. Late on the evening of September 1 we heard a rapid succession of shots near camp, and on investigating found two Indians by their camp fire only a few hundred yards away. They were boys about 18 years of age, who had killed two caribou on Comet Creek and were returning to Eagle greatly intoxicated with their success. They had one small ham with them, representing all that was to be utilized of the two animals killed. They were so excited they could scarcely talk, and in reply to all questions answered, "Me kill um. Two; me kill um." I asked why they had fired the shots of a few minutes before, and the only variation was, "Feel heap good! Caribou! Two! Me kill um." It was evidently their first kill and seemed to indicate an uncontrollable tendency to slaughter. Doubtless, if it had been possible, they would have killed up to the limit of their ammunition, although they could carry away only a few pounds of meat. The number of Indians, however, is now so small that it is scarcely possible for them to effect any serious diminution of the game. In former years, with poorer facilities but greater numbers, they may have killed as many as now, perhaps more. Extensive caribou drives were formerly conducted by the Indians of this region. According to report, remains of the fences used in these drives are still to be seen in the vicinity of the Ketchumstock Hills.

Owing to the proximity of these caribou to the town of Eagle and to the military garrison of Fort Egbert, where domestic meats are high priced, white hunters kill as many as do the Indians, if not more. The annual increase in such a number of caribou must be very large and, as the losses from wolves and other natural enemies are perhaps not very great, the annual killing of a reasonable number

for food would scarcely endanger the existence of the species in the region. But it must be remembered that the same herd may be successively attacked by hunters from Forty Mile, Eagle, Circle, and all the outlying camps, as well as by those from the Tanana region, including Fairbanks, which is now nearly or quite the largest town in Alaska; hence the total number of animals killed annually may be large. Under liberal regulations, backed by good local sentiment, the caribou might be preserved indefinitely. Without proper local sentiment, little can be accomplished. Before any restrictions were attempted, unnecessary and wasteful slaughter took place. It is reported that in the fall of 1901 a white man killed 62 caribou in one day, and immediately thereafter a party of Indians killed 42. A hunter who went out the day after the slaughter of 62 killed 7, all of them cripples. He then followed the trail of the main herd for some 5 miles and found it bloody all the way. Small mining camps have often been able to obtain enough caribou to supply them with meat for many months. Many prospectors have a large meat cache near their cabins, which is usually well stocked with selected caribou meat. One such near a deserted cabin on Comet Creek contained a great quantity of dry bones, the remains of many animals. At a camp on Mosquito Creek near the south fork of Forty Mile Creek extensive facilities are said to have been arranged for keeping quantities of caribou meat in cold storage all the year around.

So few specimens of typical *Rangifer stonei* from the Kenai Peninsula have been preserved that conclusions as to its distinguishing characters are difficult to form. The horns of our Glacier Mountain specimens are in velvet and are therefore not suitable for comparison with horns in perfect condition. However, I was able to examine and photograph several pairs of antlers in Eagle and Circle. One of these, a very good head, the property of Mr. Bert Bryant, of Eagle, appears from the photographs to agree in general features with the type of *stonei*. By exclusion, also, our specimens are referable to *stonei*, for they are too large and have the antlers too much branched to be called *arcticus*. They appear to be intermediate in character as well as in range between *stonei* and specimens from east of the Yukon referred to *arcticus* (see p. 49). Therefore, *stonei* is treated as a subspecies of *arcticus*. That *stonei* may intergrade to the southward with the so-called woodland form *osborni* is very probable, as caribou are known to inhabit practically all suitable parts of the country intervening between the localities from which the two forms are now known. Moreover, the differences between the two are all relative, excessively variable, and rather intangible. Our specimens are chiefly in the dark summer pelage, and agree with specimens of *arcticus* in the same pelage from the Ogilvie Range and from Hudson

Bay except in the paleness on the hind side of the legs. The field measurements ^a of the series are as follows:

Sex.	Total length.	Tail vertebrae.	Hind foot.	Height at shoulder.
♂ ad.....	2,000	180	590	1,220
♂ im.....	1,900	180	580	1,090
♂ im.....	1,830	180	580	1,090
♂ im.....	1,730	155	565	1,060
♂ juv.....	1,290	135	450	860
♂ juv.....	1,350	135	470	920
♀ ad.....	1,880	160	560	1,020
♀ ad.....	1,860	175	540	1,050
♀ ad.....	1,770	140	560	1,050

***Alces americanus gigas* Miller. Alaska Moose.**

Moose are very abundant in several more or less restricted localities near the Yukon between Eagle and Circle. Judging from report, they live near the river throughout the summer, visiting with considerable regularity certain ponds and sloughs to drink or to wallow when mosquitoes are abundant. In some places, when the water from very shallow ponds has evaporated, a slightly alkaline residuum is produced, which hardens in a thin layer over the bed of the pond. These places are said to be much frequented by moose and are called moose licks. The Indians and many of the white hunters seem to be able to go to such places and kill a moose whenever they want it. One method, which is said to be quite successful, is for the hunter to conceal himself on a scaffold in a tree overlooking the pond frequented by the moose. The only requirement for success is patience, since it is light enough to shoot at short range at any hour of the night, and since the man is so high that moose can approach from any direction without getting the scent. The chief limitation on the killing of moose is distance from a means of transportation other than that furnished by a man's shoulders. On this account the hunting is confined to the region within 2 or 3 miles of the Yukon. The vast region back from the big river, nearly all of which is good moose range, is practically untouched, and from the nature of the conditions will remain so for years to come. While moose may become scarce near the river settlements, it is hardly possible that they can be much reduced in other parts of their range while present conditions continue. The hunting near the river is carried on in an unsystematic and wasteful manner. The Indians are very slovenly in caring for meat, and often spoil much of a carcass by poor butchering and by lack of cleanliness. A favorite place for market hunters is the vicinity of the mouth of the Tatonduc River, or Sheep Creek, as it is called. A reliable man who lived at the mouth of this stream during 1902 and 1903 informed me that he had recorded the killing

^a All measurements are in millimeters unless otherwise stated.

of over 80 moose within 15 miles of his cabin during a period of eighteen months. Most of these were marketed in Eagle or in Circle, but it is safe to say that not more than one-third of the meat was utilized, and doubtless very few if any of the skins and antlers were preserved. Many calves and young animals are killed, for moose veal sells more readily and for a better price than the meat of full-grown animals. The meat is regularly used in Eagle and Circle, and is usually obtainable at about 50 cents per pound. We were in Eagle several times and boarded in Circle for three weeks, and neither town was at any time out of moose meat for more than forty-eight hours. Four carcasses or parts were brought into Circle while we were there, and one had been received a few days before our arrival. The proprietor of one of the small restaurants there told me that from time to time in the summer of 1902 he bought 27 moose from the Indians and other hunters. This number by no means represents the entire kill; nor does it indicate that 27 entire dressed animals were consumed, for in many cases the hunters brought in only a small part of a carcass, and in others much of the meat spoiled before it could be used.

Our own experience with moose was rather limited. Along the river we saw no fresh signs except in a small slough 20 miles above Circle, where Hollister found tracks in abundance. Also, we found only few signs of them in the mountains near Eagle, and prospectors who have traveled many times over the region from the head of Forty Mile Creek to the head of Mission Creek and thence to Seventy Mile Creek and Charlie River say this is a poor moose country, though in certain localities a few are nearly always to be found. We saw no tracks whatever on Seward Creek and only a very few on Mission Creek. The mountains on the opposite side of the Yukon, according to report, contain moose in much greater abundance. A small party of prospectors went up Nation Creek some 30 miles in July, 1903, and reported that moose were very numerous there and quite undisturbed. They are said to be common also on Sheep Creek.

Signs of moose were found on the top of Glacier Mountain. While following a sheep trail along the rocky ridge of the almost inaccessible pinnacles just above the head of Seward Creek, at an altitude of about 6,000 feet, I suddenly came upon a quantity of old moose dung. Although prepared to find signs of moose in the mountain passes far above timberline, I had hardly expected them in these barren rocks among jagged pinnacles through which a man could travel only with great difficulty. A little farther on were more signs, and as I proceeded the trail became literally strewn with the unmistakable elliptical pellets. Nearly half a mile beyond, the mystery was cleared up by a few scattered bones, then a few more at inter-

vals, and finally a bleached skull, nearly perfect, and bearing the antlers of a large old bull. Signs of wolves were found near by, but that they were contemporaneous with the bones could not be ascertained.

Ovis dalli Nelson. Dall Sheep.

As indicated by many well-worn trails, Glacier Mountain has been a resort of mountain sheep for many years. Probably no great number ever lived there continuously, for the suitable range is limited, and a sheep might traverse practically all of it in a day. Glacier Mountain and a few of its more important spurs are separated from any equally good sheep range by long stretches of timbered country, through which sheep would pass only under stress of circumstances. Therefore it is probable that the colony inhabiting this range has long been isolated and subject to the limitations of the food supply afforded by such a relatively small area. The few sheep now there will doubtless be extirpated within a few years. The largest number seen by us at any one time was five, and our experience led us to believe that the entire number in the region was little, if any, more than this.

The original specimens of *Ovis dalli* were received by Nelson from the fur trader Jack McQuesten, whose headquarters were at old Fort Reliance, some 7 miles below Dawson. McQuesten reported that he obtained them from Indians, who had killed them in the fall of the year and left the skins cached until winter. Mr. Nelson understood from McQuesten that the specimens were secured on the west side of the Yukon and approximately "200 miles southwest of Fort Yukon." It therefore seems probable that the type locality of *Ovis dalli* is the vicinity of Glacier Mountain, or at no great distance from it, possibly somewhere along Forty Mile Creek, near which a few sheep are still to be found. Realizing that specimens from this region would have a special value, we made particular efforts to secure sheep on Glacier Mountain, but did not succeed, for the sheep were so few and so wild that it was difficult even to sight them. Only once did I get a fair shot at one, and then my gun misfired. At another time the camp man while hunting with me opened fire on some sheep at about 600 yards, and spoiled a promising chance for a shot at shorter range. After that I hunted alone. Evidently they had been hunted before, for not only did they run at the slightest indication of danger, but they were fairly frantic at sight of a man and kept running wildly until at least one high ridge was between them and the cause of their terror. Although eventually they sought the heights after being surprised, yet they invariably ran down at first. They never ran to the top of the hill or ridge on which they were discovered, but instead made for the bottom, crossed the intervening valley or canyon, and then swiftly ascended to the fastnesses of the highest peak on the

other side. Their trails lead along every ridge, with lateral branches here and there and meanderings over occasional high flats. When surprised into running, they may start regardless of trails, but they soon strike into a beaten way and thence do not leave ground every step of which is familiar. These trails sometimes traverse rather rough country, but I have never seen one that could not be followed easily by a man of ordinary experience in mountain climbing. On one of the highest parts of Glacier Mountain a sheep trail follows up a ridge at the end of which is a large rock. The trail leads over the top of this rock and at the end is a sheer drop of about 8 feet, apparently sometimes taken at one leap by the sheep, but they alight easily on fine loose rock. The sheep of Glacier Mountain move over their trails with considerable regularity, seeming to follow a circuit encompassing their entire range. When seen, they were usually traveling from one part of the range to another. No doubt, however, they remain in one restricted locality for short periods. Thus five of them appeared one morning on a high grassy slope within sight of our camp, where none had been seen for several weeks. They remained there for two days, alternately feeding and basking in the sun, and then left for some other part of the range. They were absolutely undisturbed, and apparently had no knowledge of our proximity. Occasionally they cross from one mountain to another where there are no high connecting saddles or ridges, and then, as shown by their tracks, they descend into the timber, sometimes for considerable distances. No large rams were seen. A trio consisting of an old ewe with a very small lamb and a young ram, probably a 3-year-old, was observed several times. The party of five seen near camp apparently included these three and two additional old ewes.

Although we failed to collect any specimens ourselves, we secured by purchase in Eagle a very fine complete skin and skull of an adult male killed on Glacier Mountain in the winter of 1902. Its pelage is very full and long, almost perfect, and exhibits an amount of black mixture not previously supposed to exist in typical *dalli*. Almost the entire upperparts except the head and neck have a fine and sparingly but evenly distributed mixture of blackish hairs. The effect of this at a distance of a few feet is that of a very pale grayish blanket well distinguished from the pure white of the head and neck, while at a considerable distance the animal appears to be entirely white. A similar slight mixture of blackish is found on the front of the legs, and the upper side of the tail is more than half blackish brown. The specimen is perhaps the best representative of typical *dalli* now in any collection, for its pelage is more nearly perfect than that of the original cotypes. In them the tail is distinctly brownish, but the remainder of the animal is practically pure white, although careful search reveals a few brownish hairs along the back.

Sciuropterus yukonensis Osgood. Yukon Flying Squirrel.

This fine flying squirrel doubtless inhabits the region in which we worked. It is very difficult to obtain in summer, chiefly because traps set for it are very almost invariably sprung by red squirrels in the daytime before they can be reached by the nocturnal flying squirrels. The type of *S. yukonensis* was collected at Camp Davidson on the Alaska-Canada boundary only a few miles above the present site of Eagle, Alaska.

Sciurus hudsonicus Erxleben. Hudsonian Red Squirrel.

Moderately common along the river, but apparently less numerous than in regions of heavy spruce timber. They were often seen in poplars and birches, but their burrows, trails, and signs of permanent abode were found only in the vicinity of spruces. On one occasion a red squirrel was seen running over loose rocks on a bare open hillside, nearly half a mile from trees of any sort. In the mountains just below timberline the spruces are gathered in clumps covering areas of an acre or more. Each separate clump of these trees harbors at least one family of red squirrels, which is nearly always to be found at home.

Citellus osgoodi Merriam. Yukon Ground Squirrel.

On our way down the river from Eagle we kept a careful lookout for signs of ground squirrels, but did not find them until we reached a point about 25 miles above Circle. This is practically the uppermost limit of their distribution along the river. From this point on, they are abundant, but they are confined almost entirely to the right-hand or northern bank of the river. One specimen secured by Hollister near Circle was the only one seen on the southern side.

Many of their burrows are made in the sandy banks of the river, often only 3 or 4 feet above high-water mark, and usually open under the overhanging turfs of the bank or among the exposed roots of trees and shrubs. Higher up they are variously situated on the hillsides, where the little boreal sagebrush (*Artemisia frigida*) flourishes. As a rule, however, the hillside burrows are not in exposed places, but are more or less sheltered by small bushes near the edge of the timber. The animals were rather quiet, and seldom gave their clicking cry except when alarmed. They fought viciously when being taken from traps, often lunging at us with mouth open and claws spread. Several were seen at the water's edge, and tracks were abundant on the damp sand, but whether or not they drink there was not ascertained. Nearly all the females taken had the mammæ distended with milk. Apparently most of the young were too small to leave the burrows. At one place 5 little squirrels all of a size and evidently from the same mother were caught in rapid succession. Of these, 4 were normal in color and the fifth was in the black phase. Among adults the black phase was found in about the same proportion. Our entire series

numbers 53 specimens—10 black and 43 normal. Some of those in the black phase are entirely black, but usually, if held at a certain angle, show the spotted color pattern of the normal individual. Others are chiefly black, but have distinct chestnut patches on the nose and many gray or buffy tipped hairs along the sides. One is nearly covered with buffy gray spots on a black background.

Flesh measurements are as follows: Average of 10 adult males: Total length 456 (441–475); tail vertebræ 141 (131–153); hind foot 62.7 (60–64). Of 10 adult females: 433 (420–462); 136 (126–147); 60.3 (57–63). Weights of males run from $1\frac{1}{2}$ to $2\frac{1}{2}$ pounds, the average being about $1\frac{3}{4}$ pounds; of females from $1\frac{1}{4}$ to $1\frac{7}{8}$ pounds, with an average of $1\frac{1}{2}$ pounds.

Marmota caligata (Eschscholtz). Hoary Marmot.

Conditions in the region about the head of Seward Creek are ideal for the hoary marmot or whistler, but it appears to be quite rare there. During our entire stay we heard only two and saw but one. The latter was sunning himself on a large flat rock in front of his den one morning, when a charge of buckshot struck him, whereupon a series of convulsions ensued, and he disappeared into the foul-smelling den. A party of prospectors returning from the vicinity of the head of Charlie River brought us a specimen of this marmot, and reported them quite common in that locality.

Castor canadensis Kuhl. Beaver.

Until recently a small colony of beavers lived on the Yukon Flats only a few miles from Circle, but within a few years it has been extirpated. One of the two important fur traders secured 60 beaver skins from trappers in 1903, and this he considered a large business, as it exceeded that of the several preceding years. Most of these skins were secured at some distance from Circle. From this it appears that these animals are becoming scarce in this region.

Evotomys dawsoni Merriam. Dawson Red-backed Mouse.

Common at nearly all points. Two specimens of about half-grown young, with blackish dorsal stripes, were taken near Charlie Creek. These exactly correspond to the *fusco-dorsalis* phase well known in *E. gapperi*, but not previously noted in any of the western species of this genus. Specimens in normal color were taken wherever collecting was done.

Microtus operarius endocæcus subsp. nov. Interior Vole.

Type from mouth of Charlie Creek, Yukon River, about 50 miles above Circle, Alaska. No. 128327, U. S. National Museum, Biological Survey Collection. ♂ ad. June 21, 1903. W. H. Osgood.

General characters.—Size and color about as in *M. operarius*; skull slightly larger; audital bullæ decidedly larger.

Color.—As in *M. operarius*.

Skull.—Similar in general to that of *M. operarius*, but somewhat larger; molar series averaging a trifle longer; audital bullæ decidedly larger and more rounded; basioccipital narrow.

Measurements.—Average of 8 topotypes: Total length 168.7 (161–179); tail vertebræ 38.6 (36–42); hind foot 19.4 (19–20.5). Skull of type: Basal length 29; basilar length 25.7; zygomatic breadth 15.8; mastoid breadth 12.7; nasals 7.8; postpalatal length 11; upper toothrow 6.7.

Remarks.—This new form differs from the coast forms, *operarius*, *macfarlani*, and *kadiacensis*, in characters in which these forms do not differ from each other. Since it is therefore impossible to definitely refer specimens of the interior form to any one of the coast forms, it seems advisable to recognize the slight characters in which it differs from them collectively. In the very large series that have been examined from both coast and interior, the difference in size of audital bullæ is remarkably constant. Of the interior form, 122 specimens have been examined, as follows: Mouth of Charlie Creek, 15; Circle, 46; Yukon River, 20 miles above Circle, 15; mountains near Eagle, 46.

These mice were found to be very abundant in the high mountain meadows about the head of Seward Creek. The very mountain tops, wherever moist tundra-like vegetation was found, were thickly populated by them. In the course of a day's walk through the meadows and along the rounded ridges, one could not fail to observe thousands of the runways of these mice. They are quite common also lower down on the timbered hillsides and to the banks of the Yukon, but at lower elevations are not so universally distributed, being confined chiefly to cold swamps. Apparently their southern limit along the river is near the mouth of Charlie Creek, as they have not been found above that point. In the mountains they may be found much farther south. They are easily distinguished from *M. drummondi* in the flesh by their yellowish coloration, and particularly by the buffy yellow underparts. Museum specimens of certain ages are occasionally difficult to distinguish by external characters, but the dentition is always diagnostic.

Microtus pennsylvanicus drummondi (Aud. and Bach.). Drummond Vole.

This vole is confined to the low country along the Yukon, and apparently does not range into the high mountains as *M. operarius* does. It is most abundant about the borders of open grassy swamps, but may also be found indiscriminately along the river banks. Specimens were collected at the following localities along the Yukon from Eagle to Circle: Charlie Creek, Circle, Eagle, 20 miles above Circle, 40 miles above Circle, Nation Creek, Seventy Mile Creek. Although

some of these are slightly larger and darker than typical *drummondii*, they are well within the variation known to occur in this wide-ranging form.

***Microtus xanthognathus* (Leach).** Yellow-nosed Vole.

Sparingly distributed along the river from Eagle to the vicinity of Circle. We were unable to discover that these large voles had any special habitat in this region, and therefore were able to catch them only by trapping in all favorable places. One was found dead in the street in Eagle, but lines of traps set in the vicinity failed to secure another. Near Charlie Creek several were taken in rather poorly defined runways in dry places about the roots of fallen trees. One was taken there in a wet, grassy swamp in the small runway of *Microtus drummondii*. One more was caught under some large roots on the bank of a small stream 20 miles above Circle. Continued trapping in all suitable places along the banks of this stream was fruitless. In a growth of young poplars on a dry hillside near the same place, Hollister killed one of these voles as it ran about in the dry leaves. The next day he almost covered this hillside with mouse traps, but obtained none of the desired species. From this varied experience we were inclined to consider the habits of this species to be very irregular. However, somewhat later in the season, as we were returning from the head of Seward Creek to Eagle, we passed over several acres in small openings in mixed woods, about 500 feet below timberline, in which the ground was honeycombed with runways. Circumstances prevented a stop there, but judging by the size of the runways and the amount of earth at the entrances to the burrows, I feel certain that this place was occupied by a large colony of *Microtus xanthognathus*.

***Microtus mordax* (Merriam).** Long-tailed Vole.

Three specimens were secured by Hollister at our camp, 20 miles above Circle. This is slightly farther north than the previous record from this part of the Yukon,^a and is therefore the most northerly locality at which this wide-ranging species has been taken. At the head of Seward Creek this vole was very abundant, occurring along small snow-fed streams near timberline in just such localities as those in which it is well known in the mountains of the western United States.

***Fiber zibethicus spatulatus* Osgood.** Northwest Muskrat.

Signs of muskrats were seen frequently, and the animals themselves were observed swimming in several small ponds in the vicinity of Circle. They occur in rather small numbers all along the river, where they usually live in holes in the banks. Occasionally consid-

erable colonies may be found in grass-bordered ponds a short distance back from the river. The weight of an adult female taken 15 miles below Eagle was $2\frac{3}{4}$ pounds.

***Synaptomys borealis dalli* Merriam.** Dall Lemming Mouse.

Rather rare, only 4 specimens being taken. One of these was caught in a grassy swamp near Charlie Creek, and the other 3 near timberline at the head of Seward Creek.

***Lemmus helvolus yukonensis* Merriam.** Yukon Lemming.

The type and several additional specimens of this lemming were taken in 1899 in the vicinity of Charlie Creek. In 1903 trapping was not done in exactly the same locality, but several days were spent a very short distance away, and all efforts to catch lemmings were unsuccessful.

***Erethizon epixanthum myops* Merriam.** Alaska Porcupine.

An occasional barked alder bush or small spruce was seen bearing the tooth marks of porcupines, but the animals themselves were not observed. Prospectors and trappers who have traveled in the region for several years say that porcupines are seldom seen.

***Ochotona collaris* (Nelson).** Collared Pika.

Pikas were excessively abundant in the mountains about the head of Seward Creek, where conditions were ideal. Immense areas of granite rockslides are exposed on nearly every mountain side, and the tops of most of the peaks consist of bowlders and broken granite piled in great confusion. Vegetation is scattered through it nearly everywhere. A large mountain, which rose blufflike immediately opposite our camp, was a solid mass of granite, and on its steep sides hundreds of pikas lived. As we sat at work in camp, we could hear their sharp metallic barks at all hours of day or night. Their color is in even more perfect accord with their surroundings than that of their relatives in the United States. As they sit motionless on the top of a granite rock, perhaps among fragments of nearly their own size, they are very inconspicuous. However, they do not often sit long without uttering their peculiar cry. This sounds much like *enk, enk, enk*, with a metallic twang which makes it audible for a considerable distance. In hunting for them, one proceeds slowly, listening for the sharp barking cry and stepping with care to avoid starting an avalanche of rocks. When the sound is located within reasonable limits, one approaches more cautiously and scans the tops of all the more prominent rocks for suspicious-looking irregularities. Usually the little fellows are not greatly alarmed at the appearance of a man at a distance of 100 yards or more, but when he comes nearer they may suddenly disappear. It often happens that the

man gets nearer and nearer to the repeated sound until suddenly he sights the little pika not 10 yards in front of him and realizes that it has been within his range of vision ever since he first heard it. Then the little gray object silently runs down from its elevated position and disappears in one of the innumerable openings below. He does not appear to run fast or to exert himself at all, yet he has gone in a twinkling. If he is really much alarmed, you may hear his sharp bark reverberating in the rock chambers, perhaps immediately below where you are standing, as he runs excitedly about, betraying his subterranean course approximately by the sound. But if not greatly frightened he drops out of sight silently, and in a few moments curiosity overcomes fear, and his head appears again for an instant, usually from behind a large rock. Then he whisks out of sight, and in another second may poke his nose around the other side of the same rock. If you make a move now, he is off into the depths again, and probably for good; but if you stand absolutely quiet he will glide out into full view and soon start up the side of the rock toward his perch at the top. He proceeds by a slightly hopping run, stopping every foot or so as if undecided, and clinging with his hair-cushioned feet to the side of the rock with the greatest ease. Finally he gets to the top, draws his feet in, makes a few settling motions, humps his little back quite rabbitlike, and then his expression seems to say, "Now I'm safe." In another moment he jerks his head, opens his mouth, and utters the plaintive *enk, enk*.

During August the pikas were harvesting hay, and we frequently found small stacks carefully placed on a shelving rock, where it was well exposed to the air, but at the same time protected from rain. Most of the common plants of the region entered into its composition, but *Dryas* was used most extensively.

Since this species was so poorly represented in collections, and since the mountains about the head of Seward Creek are near the type locality, a series of 88 specimens was secured there. These were taken from day to day from July 31 to September 2, and in spite of this range in dates the majority are in changing pelage. Some of the earliest had acquired almost complete fall pelage, while among the very latest are still some in which the worn left-over pelage shows to a considerable extent. The new pelage is a grayish fawn color, peppered with dusky over most of the upperparts. The neck and shoulder patch or collar are nearly pure gray and conspicuous, though the gray blends perfectly with the fawn of the head and back. In most cases this collar is scarcely developed on the underside of the neck, which is merely a few degrees darker than the rest of the underparts. The underparts, which in the left-over pelage of spring and early summer are nearly pure white, become decidedly creamy in the

new fall pelage. The series contains a good representation of young, some in the soft woolly juvenile pelage, but the majority with patches of clean, glossy adult coat appearing along the middle of the back.

The skulls are very similar to those of *O. princeps* and related forms, and the differences in color are not too great to preclude the possibility that these species may inosculate. The southern limits of *collaris* and the northern of *princeps*, as at present known, are quite widely separated by a region which may be inhabited by both or by intergrading forms. Comparison of skulls of *collaris* with a single specimen from East Cape, Siberia (sp. ?), indicates that the relationship is much more remote than with *princeps*. Average flesh measurements of 20 adult males of *O. collaris* are as follows: Total length 190 (180-198); hind foot 30.5 (30-31.5).

Lepus americanus macfarlani Merriam. MacFarlane Varying Hare.

Rabbits were fairly common along most of the river between Eagle and Circle, though it was evidently not a time of great abundance. When I passed through the same region in 1899, not a single one was seen. A few years later they had increased wonderfully, and will doubtless soon reach the maximum and then die in great numbers from disease. Several specimens were taken, and runways and feeding places were noted at every stop along the river. In the mountains they were found up to the limits of timber. In the immediate vicinity of Eagle and Circle no signs of them were seen, doubtless because of the many dogs about. In winter, when other meat is scarce, rabbits are snared in great numbers for food.

Lynx canadensis Kerr. Canada Lynx.

Tracks of a large lynx were seen in the soft sand of the river bank 20 miles above Circle. No signs of the species were seen elsewhere, and it is not abundant in the region. At Circle 2 lynx skins were received at one store in 1903 and 2 or 3 at the other, and this is said to be about the average for the past four or five seasons.

Canis albus Sabine.^a Northern Wolf.

Although so many caribou annually pass through the mountains near Eagle, wolves are seldom reported, except in limited numbers in winter. A hunter and prospector who had been traveling over the region for several years told me that he had rarely seen a wolf track and had observed the animals but once, when he saw a pack of 40 or 50 near the head of Charlie River.

Vulpes fulvus alascensis Merriam. Alaska Red Fox.

According to report, foxes are quite rare in this part of Alaska, both along the Yukon and in the mountains. We saw no signs of them.

^a See note, N. Am. Fauna No. 24, p. 39, 1904.

Ursus horribilis phæonyx Merriam. Grizzly Bear.

Grizzlies are comparatively scarce in the region, but reports of encounters with them are occasionally brought in by prospectors. Such reports usually come from the mountains, and are probably reliable, but most of the recent reports of grizzlies on the Yukon banks prove to refer to large cinnamon bears. The type of *Ursus h. phæonyx* was killed by Bert Bryant, of Eagle, on an open treeless ridge on the west side of Glacier Mountain, some 2 miles below the source of Comet Creek. I visited the spot later in search of the skull, which had been left with the carcass, but neither then nor at any time while in the region of Glacier Mountain did I find fresh signs of grizzlies.

Ursus americanus Pallas. Black Bear. Cinnamon Bear.

Although our party saw no bear tracks, both black and cinnamon bears are fairly common along the part of the Yukon traversed by us and also in much of the country back from the big river. The cinnamon phase appears more common than the black, but both occur. A female cinnamon bear and cubs were killed near Seventy Mile by a party of prospectors, who displayed one of the cubs to us as their boat floated by our camp on the evening of June 30. An imperfect weathered skull was picked up by Hollister near the mouth of Nation Creek.

Lutra canadensis (Schreber). Land Otter.

Otters are quite rare throughout the region, and perhaps never were abundant. The few that remain are confined chiefly to small branches of tributaries of the Yukon remote from navigable waters. The chief fur trader at Circle reported that in 1902 he secured only 2 otter skins, while in 1903 none were offered.

Lutreola vison ingens Osgood. Mink.

We failed to secure any mink, and were informed that they are not especially common. One of the traders in Circle reported having received 30 mink skins in 1903, and this number is believed to be about half of those taken throughout a wide area; so it appears that mink are scarcely more numerous here than in many parts of the United States. The number received at Eagle was not ascertained, but was doubtless much smaller, as very little fur trading is done there.

Putorius arcticus Merriam. Arctic Weasel.

Weasels were very abundant in the mountains about the head of Seward Creek. Two specimens were taken on the Yukon bank 20 miles above Circle. These were caught at the mouth of a burrow of the large ground squirrel (*Citellus osgoodi*). No doubt they were preying upon the squirrels, although the latter are fully four times

as heavy as the vicious little carnivores. In the mountains they were found chiefly in the granite rock slides, feeding on the excessively abundant pikas (*Ochotona*), although a considerable number was taken in thickets of dwarf birch near timberline, where they were doubtless seeking voles and shrews. In their hunting they apparently cover quite a range of territory. Traps kept set in one place continued to catch one or more weasels every day or two during our entire stay in the region. Several of the animals were watched as they glided in and out among the rocks, covering in a few minutes half a mile or more of territory. At such times they seemed entirely fearless, and paid scarcely any attention to us. Once, as I visited a trap, I found a weasel just attacking the bait, which consisted of a dismembered pika. I stood within 4 or 5 feet and watched as the animal came out of a crevice in the rocks, seized a piece of the meat, and began to tear it greedily. He moved like a flash, several times disappearing in the crevice, but immediately returning, meanwhile paying no attention whatever to me. His beady black eyes and little flashing white teeth, combined with the contour of the head, made him a perfect embodiment of ferocity. Fearing that he might miss the trap, I moved back a few paces to shoot him, when he flashed out of sight and did not reappear in the few moments that I waited. Returning a few hours later I found him in the trap. Unless traps were inspected within a few hours after weasels were caught, the animals were found dead, doubtless from their violent efforts to escape. When alive they were always on the defensive, and fought viciously to the last breath.

A series of 42 specimens was secured within a radius of 500 yards from our camp at the head of Seward Creek, all caught in 4 traps; so it is evident the animals were very abundant. A single trap in one location caught 3 weasels in one day. Of the 42 specimens, 28 are males and 14 females. As shown by their skulls, very few of these are well-matured individuals, but the majority are apparently from 1 to 2 years of age, having inflated braincases without definite sagittal crests. Of those undeniably adult, and having all their characters developed, there are 4 males and 3 females. Among these, 2 males and 1 female are slightly smaller throughout than the others, even the teeth being definitely smaller. Under different circumstances such a discrepancy in size might well be assumed to be specific or subspecific, but when all the specimens are from one spot, it is difficult to look upon it as more than individual variation. The flesh measurements of the 2 large adult males are as follows: Total length 336, 330; tail vertebræ 87, 90; hind foot 46, 45. Those of the 2 smaller adult males are: 309, 298; 78, 80; 43, 40. The largest and smallest adult females measured, respec-

tively: 283, 253; 69, 63; 34, 35. The immature specimens are larger than the adults, not only in flesh measurements, but also in most of the dimensions of the skull. The teeth in this series, however, vary but little.

In color, the younger animals are rather darker than the fully matured. The upperparts are nearly uniform Prout brown; the underparts in most cases are strongly tinged with yellow, this more intense in the older examples, almost the entire underparts being clear Naples yellow (Ridgw., Pl. VI, No. 18). The chin and the maxillary region are in all cases creamy white without yellow suffusion. Of the 28 males, one has a large distinct brown pectoral spot, and 6 others have small indistinct spots or traces of brown on the breast. One of the females also has a small brown pectoral spot. The remainder have immaculate underparts. With six exceptions, all have the color of the underparts continued on the underside of the tail, nearly to the base of the black tip. The exceptions have the underside of the tail decidedly lighter than the upper, but not yellowish. The amount of black at the end of the tail is in every case practically two-fifths of the entire length of the tail. There is also no appreciable variation in the distribution of light and dark on the feet. On the hind feet the dark color of the upperparts extends down from the leg, covering the heel and the inside of the foot to a point about two-thirds of the way from the heel to the end of the toes. The light undercolor extends down the outside of the foot and covers the toes and metatarsal region. The fore feet are the same color as the underparts, with a line of brown on the outer side of the forearm, reaching about to the metacarpal joint.

***Mustela americana actuosa* Osgood. Marten.**

In spite of long-continued trapping the marten is still taken in large numbers, being, as in former years, the principal fur-bearing animal of the region. In 1903 one of the two traders in Circle received 1,067 marten skins and the other about the same number. We had opportunity to examine about 1,000 as they lay on the floor of a warehouse. Remarkable uniformity of color prevailed in this unusually fine series. The general pale coloration, light brownish gray head, whitish ears, nose, and chin, as detailed in the original description of *M. a. actuosa*, were found to be very constant. In the entire series only some twenty to thirty skins were dark colored, and these may have been from animals caught beyond the range of true *actuosa*. Their exact source could not be ascertained, but the traders say their fur seldom comes more than 200 miles. White trappers and Indians now catch about equal numbers, but the proportion taken by Indians is rapidly decreasing.

Gulo luscus (Linn.). Wolverine.

A few wolverines are killed in the vicinity of Circle each year, but they are considered rather uncommon.

Sorex tundrensis Merriam. Tundra Shrew.

Along the river from Charlie Creek to Circle, several were taken under logs and drift, while in the mountains at the head of Seward Creek they were very common, being found chiefly in mossy places about the roots of the dwarf birch. The series secured is as follows: Head of Seward Creek, 33; Charlie Creek, 3; 20 miles above Circle, 2; Circle, 2. These interior specimens seem to average slightly darker than topotypes from the coast of Bering Sea, and their skulls are rather more robust, but the differences in both respects are slight.

Sorex obscurus Merriam. Mountain Shrew.

Eighteen shrews of this species were taken in the mountains about the head of Seward Creek. It occurs also, though doubtless rarely, in the lower country along the Yukon, as is attested by one specimen secured by us 20 miles above Circle. Fresh specimens in the field are readily distinguishable from the other species of the region by their longer tails. This species has not been previously recorded from Alaska, though closely related forms are known from the coast of the Territory. Its occurrence in the interior mountains was to be expected, as specimens from the Alaska Peninsula were known to be only slightly different from typical *obscurus*.^a The Alaska specimens of *obscurus* are rather more robust than the average from the United States, but agree perfectly with specimens from Henry House, Alberta, previously referred to *obscurus*.^b

Sorex personatus arcticus Merriam. Arctic Shrew.

This shrew and the tundra shrew were about equally abundant in the mountains near Eagle. Altogether 35 specimens of the smaller species were taken there. They were caught in various situations, but as practically the entire region is relatively moist and cool there was little choice for them. Along the Yukon they are much less common, but are generally distributed, and a few specimens were usually taken wherever much trapping was done. The following localities are represented: Charlie Creek, Circle, 20 miles above Circle, 40 miles above Circle, Eagle, and head of Seward Creek.

These specimens, like those from the Alaska Peninsula previously referred to *arcticus*,^c are practically like true *personatus* in color, but differ in very slight average cranial characters.

^a Cf. N. Am. Fauna No. 24, p. 50, 1904.

^b Cf. Merriam, N. Am. Fauna No. 10, p. 73, 1895.

^c Cf. N. Am. Fauna No. 24, p. 49, Nov., 1904.

BIRDS OF EAST CENTRAL ALASKA.

The following notes relate only to species observed by N. Hollister and myself in 1903. A few species not found by us were taken or seen in the same region by Dr. L. B. Bishop and myself in 1899.^a These are: *Pisobia bairdi*, *Myiochanes richardsoni*, *Empidonax hammondi*, *Loxia leucoptera*, *Spinus pinus*, and *Bombycilla garrula*. Among the spring migrants are doubtless many species not seen by us. Fortunately, however, the identity of some of these was learned through the kindness of a local collector, Mr. M. J. Coleman, whom we met in Eagle. His specimens, taken in the vicinity of Eagle, had been mounted and sent to his home in San Francisco. At his suggestion and through the courtesy of his family, I was enabled to examine the collection, and found among others specimens of the following species: *Colymbus auritus*, *Gavia pacifica*, *Larus philadelphia*, *Mergus americanus*, *Mergus serrator*, *Mareca americana*, *Spatula clypeata*, *Charitonetta albeola*, *Harelda hyemalis*, *Histrionicus histrionicus*, *Oidemia deglandi*, *Oidemia perspicillata*, *Branta nigricans*, *Lobipes lobatus*, *Squatarola squatarola*, *Charadrius dominicus*, *Arenaria interpres*, and *Plectrophenax nivalis*.

A small collection of birds from Fort Egbert, near Eagle, collected by Capt. C. S. Farnsworth, U. S. Army, is in the U. S. National Museum, and includes specimens of *Tryngites subruficollis*, *Numenius hudsonicus*, and *Pediæetes phasianellus*.

In the preparation of the following list the notes of Mr. Hollister have been of great assistance.

Colymbus holboelli (Reinh.). Holboell Grebe.

Three individuals of this large grebe were seen in a pond some 3 miles west of Circle July 10.

Larus argentatus Pontop. Herring Gull.

Between Eagle and Circle, a single large gull, or sometimes a pair, was occasionally seen flying over the river. The total number seen scarcely exceeded a dozen.

Larus brachyrhynchus Rich. Short-billed Gull.

Fairly common in the vicinity of Circle, but not observed elsewhere. A few were flying over the river before the town most of the time, and several were noted about ponds a few miles west. A flock of about 20 passed down the river late in the evening July 19.

Mergus serrator (Linn.). Red-breasted Merganser.

A small flock of mergansers, supposed to be of this species, flew by our camp near Charlie Creek June 21.

^a See N. Am. Fauna No. 19, pp. 47-96, 1900.

Anas platyrhynchos Linn. Mallard.

Fairly common along the river and in the swamps near it. A young bird in the down whose plaintive peep attracted us was found in a forlorn condition in the long grass of a small swamp near Circle July 3.

Nettion carolinense (Gmel.). Green-winged Teal.

Not seen along the Yukon, but four birds appeared in a large timberline seepage pond near Glacier Mountain August 11. A single bird was taken August 16 on a small swift stream in the same vicinity.

Dafila acuta (Linn.). Pintail.

Not common. One adult male was seen on the river near Circle, and a female with downy young was found on an inland pond. Six adults alighted in a mountain lake near our camp at the head of Seward Creek August 6.

Marila affinis (Eyt.). Lesser Scaup.

A female and six downy young were flushed from the grass at the edge of a woodland pond near Circle July 10. Several of the ducklings were killed with small shot, while the old bird fluttered about the pond until she too was added to the collection.

Clangula clangula americana Bonap. Golden-eye.

An adult female and three downy young were taken from a pond near Circle July 14. On the same day another family of them was seen swimming near the edge of a pond. At our approach the old bird fluttered rapidly to the center of the pond, and the little ones dove with alacrity and swam beneath the surface until they arose around their parent.

Branta canadensis hutchinsi (Rich.). Hutchins Goose.

Several small flocks of geese were seen near the mouth of Charlie Creek, and from that point to Circle others were noted occasionally. Above Charlie Creek, however, none were seen.

Grus canadensis (Linn.). Little Brown Crane.

Several small flocks were seen flying over the low country near Circle, where doubtless they breed.

Gallinago delicata (Ord). Snipe.

Apparently a common breeder in the vicinity of Circle. One pair frequented a small moist willow-bordered swale within a stone's throw of the outlying cabins of the town. Both birds were flushed there repeatedly as we passed through, but no nest or young birds could be found. A young bird barely able to fly was killed a few miles west of Circle.

***Pisobia minutilla* (Vieill.).** Least Sandpiper.

One taken by Hollister near Circle July 10. It flew about us excitedly, now and then alighting on the tops of small trees and acting as if its nest or young was near. Later, small flocks were seen about puddles of water in the streets (?) of Circle, where they seemed quite at home.

***Totanus flavipes* (Gmel.).** Yellowlegs.

Two seen, one of which was taken near Circle July 13.

***Helodromas solitarius cinnamomeus* (Brewst.).** Western Solitary Sandpiper.

Very common about small swamps near the river at nearly all points visited between Charlie Creek and Circle. Within a radius of several miles from Circle one or more adults were found about almost every woodland swamp. In most cases they acted like parent birds anxious for the safety of their young. Whenever we entered certain precincts, they hovered nervously about, calling loudly, or alighted on near-by trees scolding. The first pair seen near Charlie Creek exhibited such actions on the evening of June 22, and we made a hasty search in the twilight for young birds, but found nothing. The excitement of the old birds seemed to be greatest while we were in a small grassy swamp, so the next day we made a more careful search. The old birds were even more excited than before, and it was some time before we detected that, besides the loud cries ringing all about us, a faint peeping was issuing from several points in the grass. Guided by this scarcely audible peeping, we soon found three downy young birds widely separated and squatting aimlessly in the grass. They are quite small, exactly of a size, and none shows the least indication of growing feathers; evidently they belonged to one clutch, and could not have been out of the eggs more than one or two days. The eggs of this species, like those of the European green sandpiper, have been found^a in the nests of other birds in trees. The small opening where the birds were found was bounded on one side by an extensive area grown with willows of relatively small size, but on the other side was only a thin line of willows and then alders, birch, poplars, and heavy spruce, in which probably such birds as olive-backed thrushes, robins, and varied thrushes nested in abundance. Therefore there was ample opportunity for the sandpipers to lay their eggs in the nests of these birds.

In similar situations near Circle several other young solitary sandpipers were taken. One about a week old stumbled into a mouse trap set at the edge of a grassy swamp, and two others just able to fly were killed in the same vicinity.

^a Raine, *Ottawa Naturalist*, XVIII, pp. 135-138, Oct. 20, 1904.

The newly hatched young have the upperparts cinnamon rufous and blackish and the underparts creamy white, slightly tinged with cinnamon rufous across the lower neck and lower abdomen. The principal blackish markings are distributed as follows: A sharp narrow line across the lores from the base of the bill to the front of the eye; a line from the base of the bill over the forehead and along the middle of the crown; two incompletely semicircular lines around the occiput; a broad irregular patch in the middle of the back with a line on each side from the base of the wing to the flanks; a patch at the base of the tail and another between this and the middorsal patch; two bars across the wings.

In older specimens white contour feathers appear first along the sides, then the wing quills begin to sprout, later the rectrices, then the darker cinnamon spotted and edged feathers of the back and breast, and finally those of the head, neck, and throat.

Actitis macularia (Linn.). Spotted Sandpiper.

Very common all along the Yukon and also along the mountain streams between Eagle and Glacier Mountain. Several were noted about small seepage lakes above timberline on Glacier Mountain. Hollister's notes record the following incident: "A sandpiper was attacked on the shore of a small lake by a northern shrike, and escaped by flying close to the water until the shrike was almost upon him and then suddenly diving into the water, leaving the shrike rapidly beating his wings and looking about for his prey. The sandpiper would come to the surface a short distance away and quietly fly to the shore, where the shrike would soon find him, and the whole performance would be repeated. It was only after three failures that the shrike gave up his quarry and retired."

? **Numenius hudsonicus** Lath. Hudsonian Curlew.

A single curlew, probably of this species, was seen on relatively high open ground near Circle, but it was very wary and we were unable to get a shot at it.

Ægialitis semipalmata Bonap. Semipalmated Plover.

Not seen except in one locality, a gravelly wash near Circle, where some half dozen birds were noted July 14. One adult and a downy young were taken here. Of the latter Hollister says: "Although it was perfectly able to run about as fast as the adults, it at once lay flat to the ground when approached, with head extended forward in the sand, making it very difficult to see, so closely did it match the ground in color."

Canachites canadensis osgoodi Bishop. Alaska Spruce Grouse.

Comparatively rare throughout the region. They are said to occur near the Yukon between Eagle and Circle, but we failed to

find any. The only ones seen were those of a flock of about half a dozen flushed near Mission Creek, some 10 miles west of Circle, September 3.

Bonasa umbellus umbelloides (Dougl.). Gray Ruffed Grouse.

Occurs in small numbers along the Yukon, frequenting deep woods, often on small islands in the early summer, and later resorting to poplar and birch woods on relatively dry slopes. One of the birds was flushed near Charlie Creek, and shed feathers were found elsewhere. Late in June the males were still drumming, sometimes as late as 10 o'clock in the evening.

Lagopus lagopus (Linn.). Willow Ptarmigan.

Fairly common above timberline in the mountains near Eagle, but much less numerous than the rock ptarmigan, with which it was associated. A prospecting party arrived at our camp September 1 with many ptarmigan killed on upper Charlie River, the majority of which were of this species.

Lagopus rupestris (Gmel.). Rock Ptarmigan.

Very abundant on all the mountains near our camp at the head of Seward Creek. Early in August they were still scattered in small parties, but by the latter part of the month they were beginning to assemble in flocks of considerable size. Berries were very abundant, and the birds were waxing fat. The crops of nearly all specimens taken were crammed with ripe and half-ripe blueberries, crowberries, leaves of *Dryas*, and fruit of *Cassiope*.

Pediocetes phasianellus (Linn.). Sharp-tailed Grouse.

July 10, on a weedy flat about half a mile below Circle, Hollister flushed an adult female of this species with her brood of young. He secured the old bird, and two days later we beat over the entire vicinity with a dog and succeeded in bagging three of the young, which were just old enough to make short flights. They are known by local hunters as pin-tail prairie chickens, and are said to be not uncommon near the river in the fall, but no reports of their occurrence north of Circle were obtained.

Circus hudsonius (Linn.). Marsh Hawk.

One was seen 10 miles above Circle, and three others were noted at long intervals flying over high mountain basins near Glacier Mountain.

Accipiter velox (Wils.). Sharp-shinned Hawk.

One of these small hawks came dashing through the trees near camp at the head of Seward Creek August 13, and after that date others were seen occasionally in the same vicinity. One specimen was taken by Hollister August 13 and another September 2.

***Astur atricapillus* (Wils.). Goshawk.**

One was seen at Circle in July and several others at the head of Seward Creek in August. A dead bird was found in deep woods in a trail near Eagle.

***Archibuteo lagopus sanctijohannis* (Gmel.). Rough-legged Hawk.**

About half a dozen roughlegs were noted at intervals during the trip down the river from Eagle to Circle. Near Charlie Creek, June 21, a nest was found in the top of a tall spruce, about which a pair of old birds circled screaming loudly. A pair of these birds frequented the neighborhood of Glacier Mountain and were seen occasionally soaring over the summit or beating the open slopes just above timberline.

***Aquila chrysaetos* (Linn.). Golden Eagle.**

The bulky nest of a golden eagle, evidently containing young birds, was observed on an inaccessible cliff a few miles below Seventy Mile. One of the parent birds, which appeared on our approach, was the only golden eagle seen on the trip.

***Falco peregrinus anatum* Bonap. Duck Hawk.**

Duck hawks were rather common along the Yukon between Eagle and Circle. Pairs, and often their nests as well, were seen at frequent intervals on or about the higher cliffs rising from the water's edge. Several duck hawks were seen also about the rocky sides of the upper part of Glacier Mountain.

***Falco columbarius* Linn. Pigeon Hawk.**

Pigeon hawks were not seen near the Yukon, but were fairly common on Glacier Mountain. At least a dozen, several of which were taken, visited at different times the clump of spruce trees in which our camp was situated. Most of these were young birds of the year, perhaps members of family parties, as several were usually associated.

One evening I shot a kinglet near camp, and it began to tower, and rose straight up into the air until almost out of sight, when suddenly a pigeon hawk appeared on a line with it, flying with incredible speed, and took it in as if it had been a fly.

***Asio flammeus* (Pontop.). Short-eared Owl.**

One was flushed from a thicket of dwarf birch near the head of Seward Creek August 18, and afterwards several others were seen.

***Scotiaptex nebulosum* (Forst.). Great Gray Owl.**

The body and head of a recently killed great gray owl were found at a roadhouse near Seventy Mile, June 19.

Bubo virginianus subsp. Horned Owl.

Occurs sparingly throughout the region, but noted only at our camp 20 miles above Circle, where one was seen and two were heard hooting at night.

Surnia ulula caparoch (Müll.). Hawk Owl.

One was taken near Charlie Creek at midday June 21. It was sitting in the top of a small spruce, uttering a weak high-pitched rattling cry. Hawk owls were rather common in the mountains near Eagle. Several were killed from the tops of the spruce trees immediately about camp at the head of Seward Creek. They often alighted within shooting distance of the tent, snapping their bills at us and not taking flight unless we made positive demonstrations against them.

Ceryle alcyon (Linn.). Belted Kingfisher.

A kingfisher noted at Eagle June 17 was the only one seen.

Picoides americanus fasciatus Baird. Alaska Three-toed Woodpecker.

Occasionally seen or heard throughout the region, but by no means common. One was taken and another heard near Charlie Creek June 21; a pair was secured near Circle July 14; three were seen between Eagle and Glacier Mountain, one of which was taken September 1.

Colaptes auratus luteus Bangs. Northern Flicker.

Some half dozen flickers were seen along the Yukon between Eagle and Circle. They were fairly common near Circle, where they had apparently been nesting in large cottonwoods on islands in the river. At least ten were seen near timberline on Seward Creek.

Sayornis saya (Bonap.). Say Phoebe.

Rather common along the Yukon, especially about rocky banks and cliffs where they doubtless nest. Several were noted about outlying cabins at Circle. A few were seen above timberline on Glacier Mountain in August.

Nuttallornis borealis (Sw.). Olive-sided Flycatcher.

Several were seen or heard and one specimen was taken 10 miles above Circle July 2. Two adult females were taken by Hollister near the head of Seward Creek August 4.

Empidonax trailli alnorum Brewst. Alder Flycatcher.

Rather common in the willows along the river between Eagle and Circle. Several were taken at Circle.

Otocoris alpestris arctica Oberh. Alaska Horned Lark.

Several were seen and three taken on the summit of Glacier Mountain August 7. After that date none were seen until August 25, when they appeared in large numbers associated with flocks of long-

spurs. They were particularly abundant on the long open ridges along upper Comet Creek and in all the other rolling tundralike region just above timberline.

Perisoreus canadensis fumifrons Ridgw. Alaska Jay.

Common throughout the region. At almost every camp no sooner was the tent pitched than one or more jays appeared and after a preliminary survey made themselves at home. At the camp on Seward Creek, where we had meat hanging most of the time, they were especially familiar. Their actions and some of their various notes constantly remind one of titmice.

Corvus corax principalis Ridgw. Northern Raven.

Fairly common along the Yukon. Several raven nests were seen on cliffs overhanging the river, and among the birds seen many were obviously young of the year. At Circle in July ravens were associated in flocks. During the first two weeks at our camp on Seward Creek no ravens were seen, but as soon as large game was killed a few appeared and remained about the carcasses.

Nucifraga columbiana (Wils.). Clark Nutcracker.

Mr. Bert Bryant, of Eagle, states that while traveling in the mountains near Eagle he saw several of these birds, with which he was familiar in Montana.

Euphagus carolinus (Müll.). Rusty Blackbird.

A few rusty blackbirds, some of which were carrying food for nestlings, were seen in a small swamp near Charlie Creek June 21-23. Large flocks containing adults and young of the year were found in July about swamps and ponds a few miles west of Circle. A series of 20 specimens was taken.

Leucosticte tephrocotis Swains. Gray-crowned Leucosticte.

A few small flocks of adults and young were seen about the rocky pinnacles at the extreme summit of Glacier Mountain. Five specimens were taken August 7.

Acanthis linaria (Linn.). Redpoll.

Regularly distributed along the river, but especially abundant and breeding in the vicinity of Circle. A nest and four fresh eggs, probably a second laying, were found in a small black spruce near Circle July 10, and well-grown young were taken July 17. Redpolls in flocks were common in the mountains near Eagle in August.

Calcarius lapponicus alascensis Ridgw. Alaska Longspur.

A few were noted August 14 in high basins on Glacier Mountain. After that date they gradually increased in numbers until they became excessively abundant. Thousands were seen August 26 in undulating flight near the ground over the open ridges that border the upper course of Comet Creek.

***Passerculus sandwichensis alaudinus* Bonap.** Western Savanna Sparrow.

Seen in small numbers along the river banks and in adjacent grassy openings. Very abundant in the vicinity of Circle and often observed about the streets of the town. Common in the higher parts of the mountains near Eagle.

***Zonotrichia leucophrys gambeli* (Nutt.).** Intermediate Sparrow.

Generally distributed throughout the region except above timberline. Nestlings were taken near Circle June 27 and well-grown young in first plumage July 8. A nest containing four small young was found by Hollister June 19 on the ground on a small bank near the mouth of Nation Creek.

***Zonotrichia coronata* (Pall.).** Golden-crowned Sparrow.

Several golden-crowned sparrows, evidently migrants, appeared in some low willows near our camp on Seward Creek August 30. One specimen was taken by Hollister.

***Spizella monticola ochracea* Brewst.** Western Tree Sparrow.

Not seen along the Yukon except at Circle, where a few adults and several partly grown young were found. Fairly common about the head of Seward Creek and in the willows along the creeks between Eagle and Glacier Mountain.

***Junco hyemalis* (Linn.).** Slate-colored Junco.

Abundant throughout the timbered part of the entire region. It could be seen on any short walk through the woods along the Yukon and in every clump of spruces on the mountains.

***Junco hyemalis montanus* Ridgw.** Montana Junco.

An adult female junco having vinaceous sides and pronounced of this form by Mr. Ridgway was collected by Hollister at Circle July 7. Its nest and five fresh eggs were taken on the same date. It was evidently a second set, as numerous young in streaked plumage were already flying about. The nest was built in moss at the foot of a small black spruce and was composed of fine dry grass with a lining of moose hair. Also a specimen collected by myself near Charlie Creek in 1899 appears to be of this form.

***Melospiza lincolni* (Aud.).** Lincoln Sparrow.

One was taken near the Yukon 40 miles above Circle June 24. Several were seen during August skulking through the willows and dwarf birch near camp at the head of Seward Creek.

***Passerella iliaca* (Merr.).** Fox Sparrow.

Common along the Yukon, especially in the vicinity of Circle. It often sings at night, mingling its melody with that of the thrushes. Young barely able to fly were taken near Charlie Creek June 23, and a nest containing newly hatched young was found on the ground in

a dense thicket near Circle July 11. A few migrating or wandering fox sparrows appeared about the head of Seward Creek August 30 to September 3.

Petrochelidon lunifrons (Say). Cliff Swallow.

A few cliff swallows were seen near Seventy Mile June 18, but the species was not noted elsewhere.

Hirundo erythrogastra Bodd. Barn Swallow.

A few noted at Eagle in June were the only barn swallows seen.

Tachycineta thalassina lepida Mearns. Northern Violet-green Swallow.

Common all along the Yukon between Eagle and Circle. It nests in crevices in the rocky cliffs or in deserted cabins.

Riparia riparia (Linn.). Bank Swallow.

Very abundant along the Yukon, especially in the vicinity of Circle, where thousands were breeding in the numerous cut banks of the river.

Lanius borealis Vieill. Northern Shrike.

Not seen along the Yukon, but rather common about the head of Seward Creek, where several specimens were taken, all birds of the year. One was seen pursuing a spotted sandpiper (see p. 36).

Vermivora celata (Say). Orange-crowned Warbler.

Fairly common, frequenting thickets of alders and willows. Two specimens were taken near Circle and two at the head of Seward Creek.

Dendroica æstiva rubiginosa (Pall.). Alaska Yellow Warbler.

Regularly distributed along the Yukon, inhabiting willows almost exclusively. A nest containing four newly hatched young was found about 10 feet up in a willow near Circle July 11. Observed also along Seward Creek up to timberline.

Dendroica coronata (Linn.). Myrtle Warbler.

Common along the Yukon between Eagle and Circle, frequenting large spruce timber more than the other warblers of the region. Young in first plumage were taken near Circle July 4. Migrating birds appeared about the head of Seward Creek August 24, and thence to September 1 were seen daily.

Dendroica striata (Forst.). Blackpoll Warbler.

Seen occasionally along the Yukon. They appeared in increased numbers near Circle July 3, in company with other warblers, thrushes, and other birds—part of a slight migrating movement. At the head of Seward Creek this species was not seen until August 30, when migrating birds appeared in the spruce trees near camp.

***Seiurus noveboracensis notabilis* Ridgw. Grinnell Water-thrush.**

Very common all the way from Eagle to Circle. Common also in thickets of alder and willow along Seward Creek. Its ground-running habits caused it to become a frequent victim of our mouse traps.

***Wilsonia pusilla pileolata* (Pall.). Pileolated Warbler.**

Abundant along the Yukon from Eagle to Circle. During June and July it was the most common warbler in the thickets of willow and alder near the river. In August it was common along Seward Creek to timberline, and in the latter part of the month birds of the year were especially numerous.

***Anthus rubescens* (Tunst.). Pipit.**

Common in early August on the high open ridges above timberline on Glacier Mountain. After the middle of the month they began to descend and were found also among the bowlders and gravel beds in the creek bottoms below timberline.

***Penthestes hudsonicus* (Forst.). Hudsonian Chickadee.**

Occurs sparingly along the Yukon in June and July. Specimens were taken at Circle and at a point 40 miles above Circle. Seen only rarely on upper Seward Creek prior to August 17, when small flocks appeared.

***Regulus calendula* (Linn.). Ruby-crowned Kinglet.**

Fairly common in August about the head of Seward Creek, but not seen lower down.

***Myadestes townsendi* (Aud.). Townsend Solitaire.**

A pair of solitaires and four young just from the nest were found by Hollister flitting about a cliff on the Yukon bank 20 miles above Circle June 25. The adult female and three of the young were taken. So far as I know, this is the northernmost locality at which this species has been found.

***Hylocichla aliciae* (Baird). Gray-cheeked Thrush.**

Fairly common in the vicinity of Circle, where several specimens, including young of the year, were taken June 28 to July 13. It is greatly outnumbered, however, by the olive-backed thrush, with which it associates. Like the olive-back, it is an exquisite nocturnal songster. When the two are heard singing in the same thicket, their notes, though similar, can be distinguished. A very few gray-cheeked thrushes were noted near the head of Seward Creek, and an immature bird was taken there August 6.

***Hylocichla ustulata swainsoni* (Cab.). Olive-backed Thrush.**

Very abundant along the Yukon between Eagle and Circle. Occurs also in considerable numbers along Mission and Seward creeks to

timberline. They were particularly numerous in the vicinity of Circle in July, when family parties of four to six were to be found in every piece of woods. In June and early July they were in full song. Although rarely heard in the daytime except in cloudy weather, they sang almost continuously through the night. One of the greatest delights of summer camping in the Yukon Valley is to lie in one's blankets at night listening to the ringing chorus of these thrushes. If the camp be fortunately chosen, one hears not one or two but a score of songsters. First we may have a bird less than 20 feet from the tent whose every utterance is audible, varying from tones of the greatest depth and richness to exquisite inarticulate gurglings and confidential whisperings. Then a few rods farther away may be several others alternating with one another in a long-continued obligato, while still farther back in some small ravine are those whose songs are borne on the air with a slight reverberation, giving added charm. While we lie in delicious enjoyment of these nearer songs, a general sense of music pervades the air to the farthest echoes. Perhaps there is a momentary lull, a sudden silence crowded with expectation. Then from a deep canyon beyond the wooded ridge behind us comes a far-away note, faint but full of character, and though little more than an echo, still with a tone that thrills. In the same way other notes, or a whole chorus, faint but sweet, are borne from the distant thickets across the river.

Planesticus migratorius (Linn.). Robin.

Rather scarce along the Yukon except about the towns of Eagle and Circle, where they were found in small numbers. Noisy flocks of roving migrants were common about upper Seward Creek in August.

Ixoreus naevius meruloides (Swains.). Northern Varied Thrush.

A few varied thrushes were seen or heard at Nation Creek, Charlie Creek, and several points between Charlie Creek and Circle. Young in full plumage were taken at Circle July 2. Varied thrushes were found also in small numbers in the groves of spruce near timberline about Glacier Mountain.

Saxicola oenanthe (Linn.). Wheatear.

On August 7, the day after our arrival at the head of Seward Creek, a party of wheatears, two adults and several young, was found flitting about some rock piles near camp. Thereafter one bird or more was seen on every trip into the higher parts of the mountains. The young were in spotted first plumage, and apparently had been out of the nest but a short time. They frequented slides and heaps of small broken rock almost exclusively. When flying they suggest bluebirds, but when walking or running they remind one of pipits.

II. THE OGILVIE RANGE, YUKON TERRITORY.

INTRODUCTION.

In the early part of the summer of 1904 a trip was made into the Ogilvie Range northwest of Dawson, Yukon Territory. The object was to supplement the work done in 1903 in the mountains lying on the opposite side of the Yukon River, in Alaska. Trips to this region hitherto projected had been abandoned on account of the rather large expense involved. Means of overcoming this difficulty came most opportunely at this time in an offer of cooperation from Mr. Charles Sheldon, of New York.^a Accordingly plans were soon perfected and a party made up, including, besides Mr. Sheldon and myself, an artist, Mr. Carl Rungius, the well-known painter of American game animals. This party proved very congenial, as well as effective. To both the other members I am indebted for much help and suggestion in the natural history work, but especially regarding the large game animals.

ITINERARY.

Arriving in Dawson early in July, we rapidly made preparations, secured pack horses, and added to the party two packers and camp men, Charles Gage and Edward Sparr. Mr. A. B. Newell, General Manager of the White Pass and Yukon Route, most courteously assisted us in these preliminaries. On July 7 we left Dawson by river steamer and the next day landed at the mouth of Coal Creek. The outfit was loaded upon five pack horses on the morning of the 9th, and we started up the creek, following a small tram railroad to the mouth of the first right-hand or eastern branch of the creek. At the mouth of this branch, near a cabin called Robinson's Camp, we turned to the left, leaving the tram road and following the main stream. On the 10th and 11th we continued up the main stream to a logging camp situated at the mouth of a fair-sized left-hand branch, the place known as 'The Forks.' No trails suitable for horses were found, and the best progress was made by keeping as near the bed of the stream as possible and fording frequently. Much of the time it was necessary for an axman to clear the way. Some 5 miles above 'The Forks' a narrow canyon on the eastern branch of the stream

^a Mr. Sheldon most generously bore practically the entire expense of the trip, and did everything in his power to make it a success.

was encountered. On the 13th, with some difficulty and considerable delay, the canyon was passed on the west bank, the total distance accomplished in the day being not more than 3 miles, since it was necessary to reduce loads and cover the route twice. Thence we proceeded upstream, and on the 16th still found good traveling near the creek, although steep mountains crowned with jagged pinnacles rose on each side. A short march on the 17th brought us to the last important fork of the creek, and there a base camp was established just below timberline and maintained until August 8, when the return was begun. The distance of 40 to 45 miles from our main camp to the mouth of the creek was accomplished in twenty-one hours of actual travel during the four days ending August 11.

GENERAL ACCOUNT.

Coal Creek rises in the heart of the Ogilvie Range and flows in a general southwestward direction to the Yukon, which it enters 6 miles below the town of Fortymile. It has not been accurately surveyed, and much of its upper course has seldom or never been visited by white men. Its few small tributaries, as well as the mountain peaks about them, are therefore unnamed. Its lower course, from the mouth to the Forks, is uniform in character; its width varies from 50 to 100 feet and its depth averages about 2 feet; the current is swift and small riffles are numerous, but no distinct rapids or cascades occur below the Canyon. Long, open gravel bars are exposed at short intervals, showing that at some seasons the volume of water is much greater than in midsummer. A light canoe might be laboriously worked up to the Forks, and possibly to the Canyon, but transportation by pack horses is much more practicable.

From the mouth to the Forks the mountains on both sides gradually increase in height, those below the vicinity of Robinson's Camp being low and rounded, with gentle slopes, and those about the Forks higher and steeper, and beginning to show open, mossy spots about their summits and exposures of limestone cliffs on their sides. At the Forks the main branch makes a rather sharp turn to the eastward, and for about 6 miles does not change in general character. The valley here is about three-fourths of a mile wide and fairly level to the base of rather steep mountains on each side. The mountains are more broken on the southeast side, and through occasional gaps small mountain valleys farther back can be seen, from which rise higher peaks, bare of timber on their summits. On the northwest side the elevation is more unbroken and blufflike, and appears like the edge of a small plateau. Some 6 miles above the Forks the stream turns and comes from a more northerly direction, traversing a rocky canyon for nearly half a mile, and is more or less boulder-strewn for about 2 miles. Above the canyon it turns back and flows



FIG. 1.—YUKON RIVER, LOOKING DOWNSTREAM FROM EAGLE, ALASKA.

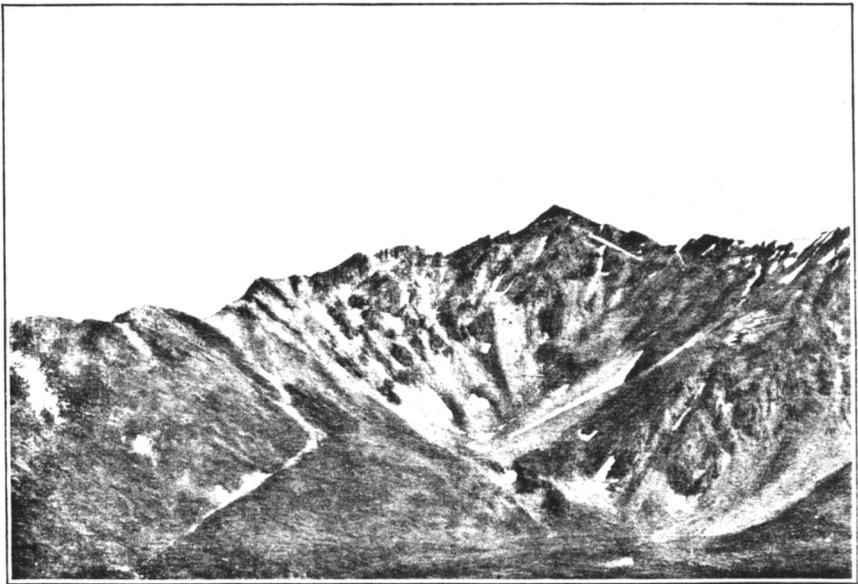


FIG. 2.—MOUNTAINS AT HEAD OF COAL CREEK, YUKON.

through a constantly narrowing valley from the westward and north-westward. From this point up, the mountains on each side close in and increase in height, their general elevation being from 1,500 to 2,000 feet above the bed of the stream. The fall of the stream still continues even, and travel along the banks is comparatively easy. Gravel bars are abundant, and fordings from one to another are frequently made to good advantage. Some 3 miles above the Canyon a branch of considerable size enters on the right, rising in high, bold mountains easily seen through the gap at the mouth of the stream. The main creek itself is now in a mass of rugged mountains of the same general elevation and all more or less connected. Small branches come in frequently and the main stream rapidly decreases in size. At the upper ultimate forks the creek is divided into two nearly equal sized streams, across either of which one may step at ordinary stages of water.

The mass of mountains about the head of these small streams is evidently part of the main Ogilvie Range, which can be seen stretching to the south and southeast. Much of the general course of Coal Creek is somewhat parallel to the main trend of the range, and to a certain extent the stream cuts through the somewhat irregular spurs which extend from the main divide in a southwesterly direction. From the summits of any of the higher peaks about the head of the creek, one looks out over a vast extent of mountainous country. To the south and east are the masses of the main Ogilvie Range. Beyond them, by following down the narrow valley of Coal Creek, the course of the Yukon can be made out, though the river itself is shut from view, and still farther in hazy distance are the peaks among which Fortymile River and Mission Creek have their sources. To the west and slightly northwest are still more mountains, through which the Tatonduc River (Sheep Creek) runs. To the north the mountains dwindle rapidly, and in the distance can be seen a low valley of considerable width, but beyond it rise the indistinct outlines of farther ranges of mountains, which doubtless drain to the Mackenzie. The peaks are of one general elevation, from 5,000 to possibly 8,000 feet above the sea. They are mostly bare of timber above 4,000 feet, and in summer their sides are sparingly dotted and streaked with snow. The mountains immediately surrounding the sources of the creek are only slightly separated into distinct ranges. About the basins of the small upper branches they form irregular semicircles, and their curving crests join at a low gap, on the other side of which trickling streams course to the northwest, evidently leading to the Tatonduc River. Between the two main branches of Coal Creek mountain masses continue as a broken plateau. On the west side of this plateau is a small valley with rather gently sloping sides, traversed by a stream which from its size and direction is evidently the main western fork of Coal

Creek, and doubtless joins the eastern one, which we traversed, at the Forks. The mountains are fairly steep and the summits rocky and in many cases broken up into irregular pinnacles. Their composition is chiefly limestone of a light gray or creamy color, occasionally stained with rusty. About some of the high basins they form steep escarpments, at the base of which are long slides of talus. These cliffs, however, are always accessible at some point.

The vegetation along the lower part of the creek is of the same general nature as that found along the Yukon and other streams of the interior of Alaska and northern Yukon territory. The white spruce (*Picea canadensis*) is the predominating tree, though the black spruce (*Picea mariana*) is abundant. In the flat swampy country near the mouth of the creek the black spruce predominates, and along low benches between Robinson Camp and the Forks it is very abundant. It is nearly always associated with the white spruce, however, and that species immediately replaces it on the higher, more solid ground. Above the Forks the white spruce is by far the more common. As a rule it reaches a height of 30 to 60 feet, and its diameter ranges from 6 to 12 inches. One tree, rather larger than usual, measured 62 inches in circumference about 4 feet from the ground. Its height was estimated to be between 70 and 80 feet. Others nearly equaling it were not uncommon. The most abundant deciduous tree is the balsam poplar (*Populus balsamifera*). This forms large groves on alluvial flats along the lower part of the creek. The aspen (*Populus tremuloides*), which is usually found in such a locality, was not observed. The paper birch (*Betula alaskana*) is rather sparingly distributed and seldom grows to large size. The common shrubs along the creek are willows (*Salix*), alders (*Alnus*), high-bush cranberries (*Viburnum*), buffalo berries (*Lepargyrea*), and dwarf birches (*Betula glandulosa*). Smaller woody plants such as *Vaccinium*, *Ledum*, *Arctous*, and *Geum*, are abundant. The bearberry (*Arctostaphylos uvaursi*) was occasionally seen.

The slopes above timberline about the head of the creek are rather more open and less grown to shrubs than usual. Alders, for example, are almost entirely absent, though common enough lower down along the creek. The dwarf birch (*Betula glandulosa*) forms considerable thickets but does not ascend far above the conifers. In the more level parts of the high basins dense thickets of willows (*Salix glauca*) usually grow. These, however, are seldom more than 20 inches high and do not impede travel seriously, particularly since in most cases they can be avoided by slight detours. The greater part of the vegetation above timberline is contained in the characteristic carpet of heathers, mosses, and small herbaceous plants, all rising to about the same level, a few inches above the soil, and stretching for miles and miles with scarcely an interruption. Vegetation extends to the very

highest pinnacles, occupying the favored depressions and crevices. *Cassiope tetragona* is the most abundant of the so-called heathers, and in many places covers large areas almost to the exclusion of other plants. Early in July its small white bell-like flowers added greatly to the attractiveness of the landscape. With it are two dwarf willows, both abundant, *Salix reticulata* and *Salix arctica*. The mountain cranberry (*Vaccinium vitisidæa*) is only fairly common, although often abundant in such localities. The black crowberry (*Empetrum nigrum*), though often seen, is likewise less abundant than usual.^a A few individuals of dwarf rhododendron (*Rhododendron lapponicum*) were found in one restricted locality. Among smaller plants found above timberline are the following: *Dryas drummondi*, *Sieversia rossi*, *Gentiana propinqua*, *Polygonum plumosum*, *Papaver nudicaule*, *Rhodiola alaskana*, *Saxifraga tricuspidata*, *Saxifraga hieracifolia*, and *Chrysanthemum integrifolium*.^b

MAMMALS OF THE OGILVIE RANGE.

Rangifer arcticus (Richardson). Barren Ground Caribou.

Certain parts of the mountains about the head of Coal Creek are scored with caribou trails. These extend for several miles down into the timber, but for the most part traverse open rolling slopes and high ridges above the limit of trees. They are quite similar in character and equal in extent to the caribou trails about Glacier Mountain, Alaska (see p. 15). Hence it is probable that during the proper season one might find on upper Coal Creek such large herds as are known to occur near Glacier Mountain and elsewhere in the north. But in July, during our stay in the mountains, caribou were found in small numbers only. They were scattered singly or in twos and threes in the high mountains about the head of the west branch of Coal Creek, several miles from our camp on the east branch. Here they appeared to be quietly spending the midsummer weeks, concerned only in avoiding mosquitoes. To accomplish this, they frequented high ridges exposed to every breeze, and when not feeding rested on the few banks of snow that remained unmelted. Their habit of spending many hours each day lying on these banks of snow made it very simple to locate them. The dark brown animals

^a Doubtless an interesting problem is to be solved as to the causes controlling the relative abundance of these alpine plants. While the same species are found associated on all the mountains of the Northwest, certain ones are decidedly predominant on a given mountain or range, and on another range, under what appear to be precisely the same conditions, these species are subordinated to others which they greatly outnumber elsewhere.

^b Specimens of these species have been deposited in the U. S. National Herbarium. For the determinations I am indebted to Frederick V. Coville and W. F. Wight, of the Bureau of Plant Industry, U. S. Department of Agriculture.

were of course very conspicuous against the white background, and it was necessary only to ascend to some high point and scan every patch of snow within view to learn whether or not caribou were in the vicinity. Since the snow banks were usually situated just under the brow of a spur or ridge, it was comparatively easy to approach the animals, provided the wind was favorable. Each of our party secured one large bull, and a young cow also was killed by Rungius for study and sketching. The entire skin and skull of one of the large bulls and the skulls and scalps of the other two were preserved.

These are scarcely distinguishable from typical *Rangifer arcticus*. Several specimens in the Biological Survey collection obtained some years ago by General Funston about 80 miles northwest of Rampart House, an old Hudson Bay post on the Porcupine River, are also referable to *arcticus*. Fortunately, in determining this, comparisons of two pelages are possible. Typical *arcticus* in summer pelage is represented by a specimen from Cape Eskimo, Hudson Bay, collected by E. A. Preble, and in winter pelage by various specimens in the National Museum, chiefly from Fort Chimo, Labrador, and Fort Rae, Mackenzie. The Rampart House specimens are in winter pelage and agree very closely with the Labrador specimens, while those from Coal Creek in the brown summer pelage are almost identical with the Cape Eskimo specimen. The only important color difference is in the hind side of the legs, which is more extensively whitish in typical *arcticus*. The Coal Creek specimens have scarcely any pale stripe on the hind side of the legs, but in the Rampart House examples it is as well developed as in the majority of Labrador specimens. Thus, in respect to the color of the legs, the Coal Creek caribou appear to show a tendency toward *stonei*, which becomes pronounced in the animals from Glacier Mountain. The skulls and teeth are practically identical with those of typical *arcticus*. The horns are in the velvet, but sufficiently developed to show their general character. They possess the back tines not usually present in *arcticus*, but with allowance for the variability of horns in caribou nothing appears to distinguish them. The specimens are readily distinguishable from *R. m. osborni* by their somewhat smaller size, lighter skulls, horns, teeth, etc., but much the same characters are in large measure bridged over in the gradation toward *stonei*, and it seems not improbable that *arcticus* will be found to intergrade also with *osborni*. This supposition is strengthened by the fact that caribou range under unvarying conditions over all the mountains from the Ogilvie Range to the Macmillan River region. Specimens from the mountains at the head of the Klondike and at the head of the Stewart would be very interesting in this connection. Field measurements of the largest male are: Total length 1,830; height at shoulder 1,220; tail vertebræ 140; hind foot 565. Measurements of two

adult male skulls from Coal Creek are as follows: Basilar length 380, 353; tip of premaxillæ to tip of nasals 124, 133; tip of premaxillæ to alveolus of pm1 145, 132; length of nasals 125, 130; interorbital breadth at lacrymal suture 141, 134; palatal breadth at m2 67, 67; distance between tips of paroccipital process 72, 83; length of maxillary toothrow 88, 90; distance between antlers just below burr 67, 66; postpalatal length 130, 127; zygomatic breadth 150, 142; length of mandible, incisive border to angle 303, 285. Antlers: Length main beam, on side, 975, 1,070; greatest spread 775, 730; greatest distance between tips of bez tines 858, 552; points in palmation 7/7, 6/6; total points 32, 34.

***Alces americanus gigas* Miller.** Alaska Moose.

Along the upper part of Coal Creek from the Forks to the head of the creek, signs of moose were found in great abundance. In the majority of cases these were very stale, at least several months old, but a few tracks were apparently quite fresh. Several weathered shed antlers were observed lying on the ground, chiefly in small open glades near timberline. Our hunting was done chiefly above timber, and though we occasionally saw a moose track there, we did not encounter any of the animals. Doubtless they are abundant in the timbered region, at least at some seasons of the year, apparently late fall and winter.

***Ovis dalli* Nelson.** Dall Sheep. White Sheep.

Ovis montana var. *dalli* Nelson, Proc. U. S. Nat. Mus., VII., pp 12-13, 1884.

Ovis fannini Hornaday, Fifth Ann. Rept. N. Y. Zool. Soc., app. No. 1, pp. 1-4, 1901.

Ovis dalli kenaiensis Allen, Bull. Am. Mus. Nat. Hist., XVI, pp. 145-148, 1902.

Mountain sheep were found in considerable numbers on all the mountains about the head of Coal Creek. Hunters from Dawson frequently obtain them near the head of the South Fork of the Klondike River, and parties from Eagle get them at the sources of Eagle and Sheep creeks; so it is evident they are common throughout the Ogilvie Range. Soon after passing the canyon of Coal Creek, we entered mountains with bare tops, several of which were ascended, and on all, old sheep trails, stale tracks, and droppings were found. Apparently these lower mountains are not included in the animal's summer range. But in the higher parts, within easy distance of our camp near the head of the creek, fresh signs were abundant, and it was rare that any of the party made a half day's hunt without sighting sheep. But, although many ewes and lambs were seen, rams were scarce, and much time was spent hunting for them. Particular estimates are not available from all members of the party, but it is safe to say that at least 200, and probably more, ewes and lambs were seen; whereas the number of rams was somewhat less

than 50, and the possibility that the same individuals were counted twice was much greater in their case. With the exception of a few relatively young ones that were seen among the ewes, all the rams were running apart from the ewes in small bands of from 2 to 12.

Mr. Sheldon's notes on the habits of sheep in this locality are detailed and extensive, and it is to be hoped will be published at some future time. Therefore but little on this subject is included in the present report. It may be well to mention, however, one excellent illustration of the slight part the sense of smell plays in apprising mountain sheep of danger. I was watching a band of 11 ewes from a concealed position near the top of a ridge on the side of which they were feeding. The afternoon was warm and clear, with a gentle breeze blowing, but in the sheltered position I had taken mosquitoes were abundant. Having watched the sheep some time, and not caring to shoot any of them, I began to smoke. The sheep were some 200 yards below, and the wind blew directly from me to them. I watched the smoke as it rose and drifted toward them for some distance, and there could be little doubt that its odor reached them. Yet they paid no attention to it, and continued feeding until I showed myself, when they scampered away.

Our party secured a total of 13 specimens of sheep about the head of Coal Creek—9 males and 4 females. These range in age from 2 to 13 years and constitute an excellent series for study. All are in new pelage, but the hair is short (10 to 15 mm. long) and already shows considerable brown earth stain. A few showed traces of the previous coat in ragged stringy patches of old hair scattered on the back and sides, but most of these have disappeared since the skins have been tanned and handled.

A study of these skins and others recently acquired from the Klondike, Stewart, Macmillan, and Pelly rivers, in connection with all other available specimens of northern sheep, reveals some very interesting facts. It appears that there is practically perfect gradation from the pure white sheep to the so-called gray or black sheep (*stonei*). Briefly, the conditions are as follows: The sheep of the Kenai Peninsula and the Alaskan Range are practically pure white, though occasional specimens have a little brownish in the tail. Those from slightly farther south and east (as the cotypes of *dalli* and specimens from Glacier Mountain and Rampart House) usually have the tail quite extensively brownish and the back and sides with a sparse scattering of dusky hairs forming an indistinct mantle. They are essentially white, however, and occasional specimens are identical with those from the Kenai Peninsula. The amount of dusky is somewhat increased in specimens from Coal Creek, and pure white individuals are fewer. The tail is largely blackish brown, and this color often extends forward a short distance along the middorsal line,

while in certain examples the accumulation of dark hairs on the front sides of the legs is so great as to form a rather definite dark line. Still, the general effect, particularly at a distance of a few yards, is that of a white animal, although the blackish tail is often noticeable even in live animals in the field. Next come the specimens from the Klondike region, the exact source of which is not known. Mr. J. B. Tyrrell, of Dawson, however, states that the majority of the sheep brought to Dawson in recent years were killed near the head of the North Fork of the Klondike River. Most of these, Mr. Tyrrell reports, are in general appearance entirely white, and are thus probably identical with Coal Creek specimens; but a few, like the type of *Ovis fannini*, have a decided dark mantle and dark stripes on the legs. In all cases the head and neck are pure white. A little farther south in the Stewart River region, white sheep are said to occur, and no doubt individuals like the darker ones from Coal Creek will be found there, but probably a series of them would average darker than the more northern ones, as the only specimen now available is darker than the type of *fannini*, and except for its white head and neck almost like typical *Ovis stonei*. This specimen, which is not quite perfect, was kindly presented by Mr. D. A. Cameron, of Dawson. It was secured near Mayo Lake at the head of Lightning Creek, near the upper Stewart River. Specimens from the upper Macmillan River show considerable variation, but the majority are essentially like this Stewart River specimen. However, although the dark-bodied sheep seems to be the dominant one in the region, occasional individuals are found which are largely white and scarcely distinguishable from specimens of typical *dalli*. Thus, one specimen, an adult female from the head of Clearwater Creek between the north and south forks of the Macmillan, shot and presented by F. C. Selous, is nearly like the average specimen from Coal Creek. The darker specimens from the Macmillan region have the body and legs practically as in typical *stonei*. All that is lacking is a slight additional mixture of dark hairs on the head and neck, and some specimens show decided tendencies in this direction. Thus one (No. 134493) shows a narrow line marked by numerous blackish hairs running up the back of the neck nearly to the base of the horns.

It appears, therefore, that the evidence of the intergradation between the pure white sheep of the Kenai Peninsula and the blackish brown sheep of the Stikine River region is practically complete. The change from one to the other is almost perfectly graduated and corresponds closely to the change in geographic distribution. At the extremes there is great constancy of characters, but away from the extremes variation begins immediately and is greatest about halfway between. It is a conspicuous example of the occurrence in a large mammal of what has repeatedly been found among small mammals.

In the nature of the case, there are specimens about equally resembling each of the extremes, and the identification of such can be scarcely more than a matter of opinion. If all the facts had been known before any names were applied, the natural course would have been to name each of the extremes and to refer intermediate specimens to one or the other according to their strongest leanings. But several names were proposed prior to full knowledge of the facts, and at least the first of these (having priority over the others) must be used, whether its type be from the intermediates or the extremes. Taking the type specimens of the four names that have been proposed, we find that *dalli*, *fannini*, and *kenaiensis* fall with one extreme and *stonei* with the other. Therefore *dalli* and *stonei* stand as names for the respective extremes, and *fannini* and *kenaiensis* become synonyms, although their respective types differ slightly from typical *dalli*. The type of *fannini* is almost exactly intermediate between the pure white sheep of the Kenai Peninsula and the blackish brown animal of the Stikine region, and it is therefore difficult to decide with which extreme to place it; but since other things are equal, considerable weight may be given to the fact that the majority of the sheep from the same region as the type of *fannini* are decidedly nearer the pure white animal. If the sheep of the intermediate type (*fannini*) occupied a definite range in which they preserved uniformity of character, the recognition of an intermediate form might be justified, but since this is not the case, the only reasonable course is to treat the names *dalli* and *fannini* as one. Such disposition of intermediates is frequently necessary in classifying small mammals, and from the nature of the case is extremely fertile in producing differences of opinion. The case of these sheep is a most interesting one and worthy of further study.

Sciuropterus yukonensis Osgood. Flying Squirrel.

Flying squirrels were not observed, but doubtless they occur, at least near the mouth of Coal Creek, as this is not far from the type locality of *S. yukonensis*.

Sciurus hudsonicus Erxleben. Red Squirrel.

Red squirrels were seen and heard occasionally throughout the timbered region, but they were not especially common. Two specimens were taken, one at the mouth and one near the head of Coal Creek.

Citellus plesius (Osgood). Ground Squirrel.

This ground squirrel was found in great abundance in the mountains about the head of Coal Creek. It occurs for a few miles within the timbered region, but in general is confined to the region near and

above timberline. This locality is much farther north than any from which the species has been recorded in Yukon. It was not found along the lower part of Coal Creek and is unknown from the Yukon banks nearer than Fort Selkirk. Its range about the upper Yukon is therefore probably connected with that in the Ogilvie Range by way of the mountains east of the Yukon along the heads of the Pelly (see p. 78), Stewart, and Klondike rivers. Its absence along the Yukon between Selkirk and Coal Creek may be due to the fact that much of this region and adjacent lowlands is underlain by beds of ice.

Our main camp near timberline was situated in the midst of a colony of these ground squirrels. They were running about within sight most of the time, and their sharp cries were constantly to be heard. A series of 19 specimens was preserved, all typical of *C. plesius*.

Marmota caligata (Eschscholtz). Hoary Marmot.

Common in all the high mountains, often being found in the same areas as the ground squirrels, but in general occupying more elevated and less accessible parts. Several families lived on the grassy slopes of a high basin some 2 miles above our camp. Here their burrows were made in comparatively soft ground and were connected by long trails through the grass and low vegetation. Elsewhere their dens were found in crevices of high rocky cliffs.

Four specimens were taken, all uniform in color and characterized by a dark blackish shoulder patch seldom exhibited by any except melanistic examples, which these do not appear to be.

Evotomys dawsoni Merriam. Dawson Red-backed Mouse.

Fairly common in the timbered region. Two specimens were taken near timberline.

Microtus pennsylvanicus drummondi (Aud. and Bach.). Drummond Vole.

One specimen was taken near the Yukon bank at the mouth of Coal Creek, where the species is doubtless common. Not found in the mountains.

Microtus operarius endœcus Osgood. Interior Vole.

Very abundant at high altitudes. Their runways ramify through the mat of vegetation covering the high basins, and they occur also where similar tundralike vegetation is found locally at lower elevations. They decrease in abundance, however, toward the Yukon, but may occur on its banks near the mouth of Coal Creek, as they have been taken in similar localities somewhat farther down the big river.

Fiber zibethicus spatulatus Osgood. Northwest Muskrat.

Occurs along the Yukon banks and in the adjacent low country. Signs of muskrats were seen about some small ponds near the mouth of Coal Creek.

Synaptomys borealis dalli Merriam. Dall Lemming Mouse.

Occurs in cold swamps near the mouth of Coal Creek, where two specimens were taken.

Erethizon epixanthum myops Merriam. Alaska Porcupine.

Doubtless sparingly distributed through the timbered part of the region. A single individual was seen ambling through the woods near the Forks of Coal Creek July 11.

Ochotona collaris (Nelson). Collared Pika.

Pikas occur at high altitudes throughout the mountains, but no colonies were observed as large as those in the vicinity of Glacier Mountain (see p. 26). However, it was scarcely possible to make a trip into any of the more rocky parts of the mountains without hearing the plaintive cry of the little pika. Several specimens were taken.

Lepus americanus macfarlani^a Merriam. MacFarlane Varying Hare.

Hares were common in the low country about the mouth of Coal Creek and thence all the way up the creek to near timberline. A young hare, about one-third grown, was found sitting in its form one day and refused to move as I walked toward it, even allowing me to set up a camera and focus within 2 feet of it. Several specimens were taken near the mouth of the creek. Two adult females weighed, respectively, 4 pounds and 4½ pounds.

Canis albus Sabine. Northern Wolf.

Very few wolf tracks were seen and only one of the animals. This one appeared late in the evening on a low ridge near Sheldon's temporary camp on the north side of the divide between Coal Creek and Sheep Creek.

Ursus americanus Pallas. Black Bear.

A small bear seen by Sheldon July 12 in an opening on the side of a wooded hill near the Forks of Coal Creek was believed to be a black bear, but in the late evening light identification was uncertain. The species doubtless occurs in the region.

Ursus horribilis phæonyx Merriam. Grizzly Bear.

An old female grizzly was killed on the open slope of a high basin July 16. Sheldon was stalking sheep at about 9 p. m., when he saw the bear on the side of the basin opposite him. Accompanied by a small cub, she was working slowly up the mountain, grubbing in the

^a Identification by E. W. Nelson.

moss. As there was no other approach, he went down and crossed the basin in full view and followed her up until within 220 yards, when he shot. He tried to catch the cub, but found it too active. The next day Rungius killed it near the carcass, where it was lingering. In the two weeks following, during which we scoured the mountains in all directions, not another bear was seen, and tracks were very scarce. High up on the side of a mountain near camp a ground squirrel's burrow had been partly excavated by a bear, but no other recent bear sign was observed.

Lutra canadensis (Schreber). Otter.

We saw no signs of otters, and reports are to the effect that they are very scarce in the region.

Lutreola vison (Schreber). Mink.

Signs of mink were noted at various points from the mouth to the head of Coal Creek. An adult female and four well-grown young were taken near the head of the creek. Two of these were caught in trails among the rocks beside the rushing mountain stream. The other two were taken at the entrances to ground-squirrel burrows, from which it appears that they were preying upon the rightful inmates. Several mink, evidently a family party, were observed one evening playing about the openings under the roots of a large spruce which grew on the bank of the creek near our camp.

The specimens, unless regarded as abnormally small, can not be referred to *L. v. ingens* or *L. v. energumenos*, either of which might be expected to occur in this region. The skull of the adult female agrees very closely with skulls of *L. vison* from northern New England, and can not be duplicated among the large series of *ingens* and *energumenos* that have been examined.

Putorius arcticus Merriam. Arctic Weasel.

The desiccated body of a weasel, of which the skull was preserved, was found lying by the side of a trail near the head of Coal Creek. A few traps were set for weasels, but without success.

Mustela americana actuosa Osgood. Marten.

Martens can scarcely be absent from the region, but no signs of them were observed by our party. The region is not frequented to any extent by trappers, and evidently it is not a good marten country.

Gulo luscus (Linnæus). Wolverine.

Fairly common. One was surprised early one morning in a small rocky gulch high above timberline. I came up to the brink of the gulch and heard a scurrying in the rocks below, after which the wolverine appeared zigzagging up the other side, weaving in and out among the rocks, getting away at top speed. He flashed in

sight and out so quickly that it was practically impossible to get a shot. As he neared the top of the open rocky hill, he passed into a small bank of thin fog, and the effect was to give him apparent increased size, so as he passed the crest he looked quite like and as big as a bear. Tracks of wolverines were occasionally seen throughout the mountains.

Sorex tundrensis Merriam. Tundra Shrew.

A specimen of this species, taken near the mouth of Coal Creek July 8, was the only shrew collected. It constitutes the southernmost record of the species.

BIRDS OF THE OGILVIE RANGE.

Histrionicus histrionicus (Linn.). Harlequin Duck.

A few pairs breed on the upper parts of Coal Creek, being distributed at rather long intervals. Two birds were seen at the Forks July 11, one at the lower end of the canyon July 12, and one at the Upper Forks camp July 27. The last named, an adult female, was killed and preserved. All were observed in swift water, but all seemed indifferent to the rushing current, and swam with apparent ease upstream or drifted down, gliding serenely over the smooth stretches and bobbing up and down over the riffles and in and out among the rocks and whirlpools. When only slightly alarmed, they drop downstream with the current, now with heads forward, now back, and again going sidewise, as best suits their purpose, but always keeping their sharp little eyes on the intruder. When suddenly frightened at short range, they take to their wings, and fly up or down the course of the stream a few feet above the water, following the abrupt turns, however numerous, and never attempting to cut off corners.

Oidemia perspicillata (Linn.). Surf Scoter.

Several small flocks were seen on the Yukon near the mouth of Coal Creek July 7. They doubtless breed about the numerous small ponds scattered along a few hundred yards inland from the river.

Helodromas solitarius cinnamomeus (Brewst.). Western Solitary Sandpiper.

A pair was flushed from a swampy spot near the mouth of the creek July 8; a single individual was seen near the same place August 13. No others were observed.

?**Pelidna alpina sakhalina** (Vieill.). Red-backed Sandpiper.

Several birds, which I am quite certain were this species, were seen on the bare rocky summits of the mountains at the head of the creek July 18. They were resting aimlessly in small groups, and were doubtless only temporary visitors to the locality. The

same vicinity was traversed frequently during the following week, but they were not seen again. Failure to secure specimens, as in the case of several other species, was occasioned by the fear of alarming mountain sheep, which were being stalked at the time.

***Actitis macularia* (Linn.).** Spotted Sandpiper.

Common and regularly distributed, two or three pairs being seen daily in our progress up and down the creek. One near Robinson's camp was seen on the tram railway at some distance from the creek, busily patrolling the sand and gravel between the ties and evidently securing a quantity of insects. Four downy young a few days old were found on a bar in the creek July 12. They were squatting in a small patch of sand, and when first discovered remained perfectly still for a moment while we stood over them; then suddenly, like so many spiders, they scurried off through the pebbles in various directions, teetering their downy stumps of tails characteristically, as if they had done so for years.

On our return to the Yukon these sandpipers were still common about the mouth of Coal Creek August 12 to 15.

?*Numenius hudsonicus* Lath. Hudsonian Curlew.

Rungius reported having seen a curlew, probably this species, in the mountains near the head of the creek July 17.

***Canachites canadensis osgoodi* Bishop.** Alaska Spruce Grouse.

Rather rare and seldom seen. An adult female was taken in a small spruce near timberline July 19. A few other single birds were seen at long intervals by various members of the party.

***Lagopus lagopus* (Linn.).** Willow Ptarmigan.

Fairly common about the upper part of the creek, and not restricted to the regions above timberline. It was first seen well down in the timbered region as we were going up the creek July 15. One was shot on the bank about 6 miles below the point where the creek enters the timber. From this point on, a few were seen every mile or two, usually in the willows near the bed of the creek. Among them were several females with broods of young, but cock birds were not lacking and seemed to be in company with the hens. Later small flocks were found in the thickets of low willows in the high basins above timberline.

As we were breaking camp August 8, a small flock of ptarmigan appeared some 10 or 15 yards behind the tent and seemed to take great interest in us. One cock bird, somewhat in advance, with craned neck, figuratively stood on tiptoes and watched us, meanwhile clucking excitedly to those behind him.

Lagopus rupestris (Gmel.). Rock Ptarmigan.

Evidently rather rare. No specimens were taken, and the only ones positively identified were two flushed from a willow thicket in a high basin near the head of the creek July 18.

Lagopus leucurus peninsularis Chapman. Northern White-tailed Ptarmigan.

Three white-tailed ptarmigan, two of which were secured, were seen in bare, loose rocks along a sheep trail on the summit of the divide at the head of the creek about 10 o'clock in the evening July 30. Sheldon reports having seen several others in similar localities. On crossing certain parts of the divide at night in one or two particularly rocky places, I invariably heard a peculiarly weird cry which at first I was inclined to attribute to a duck hawk, as it very much resembled the ordinary cry of that bird, but on one occasion I was able to trace it to a ptarmigan, probably one of this species, though the light was so uncertain I might easily have been mistaken. It was at least very unlike any of the notes of the willow or rock ptarmigan that I had heard before.

The two specimens, both males, agree with others in the same plumage from the Kenai Peninsula, kindly loaned by Mr. F. M. Chapman, of the American Museum of Natural History.^a

Astur atricapillus (Wils.). Goshawk.

One was seen flying over a low bluff near the mouth of the creek August 12.

Aquila chrysaetos (Linn.). Golden Eagle.

Frequently observed soaring over the mountains about the head of the creek. Not more than two birds were seen at any one time, and it is therefore quite probable that only one pair inhabited the vicinity. Young lambs of the mountain sheep were quite abundant, and these birds doubtless secured one now and then.

^a In 1901 (Auk, XVIII, pp. 180-181), I separated the northern and southern forms of the white-tailed ptarmigan, applying Swainson's name *leucurus* to the northern form and proposing a new name, *altipetens*, for the southern one. No specimens from the type locality of *leucurus* were available, but certain specimens from White Pass, Alaska, together with one from the Kenai Peninsula, were regarded as representing *leucurus*. Mr. Chapman, in 1902, secured additional material from the Kenai region, apparently differing from the above-mentioned White Pass specimens, and he therefore reversed the situation by calling the Kenai birds *peninsularis* (Bull. Am. Mus. Nat. Hist., XVI, pp. 236-238, 1902) and leaving *leucurus* to apply to the southern birds previously called *altipetens*. Although I believe the differences pointed out by Mr. Chapman between the Kenai and White Pass birds are wholly or largely seasonal, and that his premises were therefore mistaken, I am now convinced that his disposition of the names is the correct one. Mr. Chapman has lately obtained excellent material from Alberta which doubtless represents true *leucurus*, and new material from White Pass also is now available, all pointing to this conclusion.

Falco peregrinus anatum Bonap. Duck Hawk.

One was heard crying about a small bluff near the mouth of Coal Creek July 7. Another was seen in the high mountains at the head of the creek July 17.

Falco columbarius Linn. Pigeon Hawk.

Rather rare; one was seen in the timber just below the head of the creek July 16, another was startled from its perch on a rocky pinnacle at a very high elevation July 21, and no more were observed until August 12, when one alighted unconcernedly on our tent pole near the mouth of Coal Creek. A bird, possibly the same, was collected in this vicinity August 13.

Bubo virginianus subsp. Great Horned Owl.

Heard hooting from a wooded hill on the Yukon opposite the mouth of Coal Creek August 13. Its presence was not noted elsewhere.

Surnia ulula caparoch (Müll.). Hawk Owl.

An adult bird and an immature female, the latter of which was collected, were seen on upper Coal Creek July 15. Several others were observed on the following day a few miles below the head of the creek. They sat chattering on the tops of tall spruces and allowed me to approach without difficulty.

Picoides americanus fasciatus Baird. Alaska Three-toed Woodpecker.

One which alighted in some spruce timber near our camp on upper Coal Creek July 28, and another which was collected about 20 miles above the mouth of the creek August 10, were the only woodpeckers seen.

Sayornis saya (Bonap.). Say Phoebe.

One was observed above timberline on a high mountain near the head of the creek July 16. Sheldon reports seeing a bird, presumably this species, in a similar locality.

Otocoris alpestris arctica Oberh. Alaska Horned Lark.

Horned larks were fairly common on the high ridges above timberline in the vicinity of the head of the creek. While hunting mountain sheep in the highest parts of the mountains one seldom failed to see a half dozen or more of these birds in the course of a day's tramp. They were entirely confined, however, to the very highest parts of the mountains. They doubtless breed on these mountain tops, though we secured no direct evidence of the fact, all the specimens taken being adult birds.

Perisoreus canadensis fumifrons Ridgw. Alaska Jay.

Jays were seen only occasionally as we moved up the creek, but at our main camp they appeared as soon as we were well established and remained to the end of our stay. They proved useful as scavengers,

and though we never saw more than half a dozen at any one time, they managed to eat or carry away more meat and food refuse than several times that number would be supposed to require. Possibly some was stored for future use, but they devoured an astonishing quantity while within sight. Cooked oatmeal seemed to attract them even more than raw meat, and any scraps from the morning mush pot were speedily cleaned up. As usual they became quite tame and fearless, and one or more were to be seen at almost any time hopping about the camp fire or perched on the tent poles and ropes. Their harsh chattering was not always pleasant, but was somewhat atoned for by their less frequent soft whistle and their pert and confident ways, so on the whole their presence was welcomed.

Corvus corax principalis Ridgw. Northern Raven.

Occasionally seen along the way up and down the creek, but rather less common than usual. Carcasses of large game animals were rarely disturbed by them for several days after being exposed. In fact, in two or three cases that we were able to keep under observation, the bodies of sheep and caribou lying in conspicuous places remained untouched by ravens for more than a week. In one case, however, our confidence in the safety of dead animals was lost in a night, for a sheep killed late in the evening and left as it fell was found the next morning badly mutilated by ravens. The eyes and testicles apparently were eaten first, and then the abdomen was punctured in several places and the entrails drawn out. In another instance Sheldon found ravens feeding July 21 on the carcass of a sheep killed July 19.

?**Loxia leucoptera** Gmel. White-winged Crossbill.

High-flying flocks of crossbills, presumably of this species, were seen or heard on several occasions near the head of the creek.

Leucosticte tephrocotis Swains. Gray-crowned Leucosticte.

Two were taken in very jagged pinnacles on the extreme summit of one of the highest mountains above the head of the creek July 21; another was killed in a similar locality on the top of the main dividing ridge July 30, where, in company with one other, it was flying about during a very high wind; a third, an immature bird which seemed to be entirely alone, was collected among some loose rocks on a comparatively low hill near camp August 7. These were the only individuals of these interesting birds observed in the region, although we spent much time on the high ridges inhabited by them.

Acanthis linaria (Linn.). Redpoll.

Redpolls in small flocks were now and then seen or heard about the upper part of the creek, being rather less common than usual in this latitude.

Plectrophenax nivalis (Linn.). Snowflake.

Three individuals, apparently immature birds, were seen flying about some high pinnacles July 21. They wheeled once about my head and then disappeared in a few wide sweeps down the side of the ragged cliff below me.

Zonotrichia leucophrys gambeli (Nutt.). Intermediate Sparrow.

In a great part of the interior of Alaska and northwest Canada this sparrow is one of the most abundant summer birds. Along Coal Creek, however, it was only sparingly found. My field notes record only that several were seen near our upper camp July 28 and that one was collected there July 28, while a very few scattering birds were noticed in going up from the mouth of the creek.

Spizella monticola ochracea Brewst. Western Tree Sparrow.

A few tree sparrows were always to be found in some thickets of low willows in a high basin at the head of one of the branches of the creek. An adult female and a fledgeling were taken here August 6. Elsewhere they were seldom seen.

Junco hyemalis (Linn.). Junco.

Observed at irregular intervals and in comparatively small numbers from the mouth of the creek up to timberline. Not nearly so common as usual in the Northwest.

Iridoprocne bicolor (Vieill.). Tree Swallow.

Small flocks of 20 to 30 birds were flying about near our upper camp on and after August 1, but up to that time none were observed.

Lanius borealis Vieill. Northern Shrike.

Rather common, chiefly along the edge of timberline, where their nearly direct and rapid flight from one isolated tree to another made them quite conspicuous. Most of those seen were immature birds. Sheldon sends the following note regarding shrikes: "A pair was about my camp on the lower end of the divide constantly stealing the meat and refuse from cooking. They were most quarrelsome, and when one grabbed a piece of meat, immediately there was a fight for its possession. They kept driving off the jays, who did not appear until the shrikes had left."

Dendroica aestiva rubiginosa (Pall.). Alaska Yellow Warbler.

One taken and several seen in willow thickets along the creek near Robinson Camp August 10.

Dendroica coronata (Linn.). Myrtle Warbler.

About half a dozen were seen flitting about the tops of thick spruces near timberline August 6.

***Dendroica striata* (Forst.).** Black-poll Warbler.

Several suddenly appeared about our upper camp on the morning of August 6, evidently in migration. On the following day they were not observed, but one bird was seen in the vicinity August 9. One was also seen in a patch of willows near Robinson Camp August 11.

***Seiurus noveboracensis notabilis* Ridgw.** Grinnell Water-thrush.

Two pairs of water thrushes were seen within a short distance near the Forks July 11. Both pairs showed great excitement, evidently having nests with young in the vicinity. None were seen elsewhere until the morning of August 6, when, with other migrating warblers, they suddenly appeared in considerable numbers. One was collected on that date.

***Wilsonia pusilla pileolata* (Pall.).** Pileolated Warbler.

A female, evidently one that had bred in the vicinity, was shot from a clump of alders near the head of the creek July 17. The species was not seen elsewhere.

***Anthus rubescens* (Tunst.).** Pipit.

Pipits were fairly common on the open slopes and ridges above timberline. They frequented the same localities as the horned larks, but outnumbered them greatly. Their peculiar gait when walking over the mossy ground and their slender heads and necks and alert manners always served to distinguish them, even at a considerable distance.

***Cinclus mexicanus unicolor* Bonap.** Water Ouzel.

Several pairs occupied their respective short stretches of the creek above the Forks. A nest was noticed under an overhanging rock on the bank of the creek near our camp July 15. Another in a similar location was found near the head of one of the branches of the creek. A pair of the birds frequented a small rocky gorge traversed by the stream a short distance below our upper camp and occasionally passed by the camp or stopped to search for insects in the creek near us. Apparently their nest was located in the gorge, and they ranged about half a mile up and down on each side of it.

***Penthestes hudsonicus* (Forst.).** Hudsonian Chickadee.

Comparatively rare and seldom seen. Several were seen about 5 miles above Robinson Camp July 10, and one or two others were heard along the route. The scarcity of this usually common bird is difficult to explain.

***Regulus* sp.?** Kinglet.

Several immature kinglets were seen about 5 miles above Robinson Camp July 10.

***Hylocichla ustulata swainsoni* (Cab.).** Olive-backed Thrush.

Thrushes were comparatively rare along Coal Creek. They were seen at its mouth and were heard only two or three times on our way up to the mountains. A dozen or more individuals were seen in the timber just below our upper camp July 16. These seemed to compose a flock, and apparently were roving about preparatory to migration. A single individual was collected near the head of the creek August 6.

***Planesticus migratorius* (Linn.).** Robin.

Robins were seen for the first time along upper Coal Creek July 15 and only occasionally after that date. One was about camp July 21, and a few were heard in the vicinity now and then. Sheldon reports that robins were common near his temporary camp on the north side of the divide separating Coal Creek and Sheep Creek.

***Ixoreus naevius meruloides* (Swains.).** Varied Thrush.

The weird note of this bird was heard several times on the evening of July 11 in some heavy timber near the Forks. It was again heard near the Canyon July 12, and later two pairs of the birds were noted by Sheldon near the head of the creek.

***Saxicola oenanthe* (Linn.).** Wheatear.

A half dozen were seen on the summit of a high ridge August 1. They were flitting from rock to rock, displaying the white markings of their tails in a very conspicuous manner. I was stalking a small band of mountain rams at the time and dared not shoot for fear of frightening them, so no specimens of the wheatears were secured. The same locality and other similar ones in the vicinity had been hunted over frequently and no wheatears seen, so these birds were judged to be wanderers.

III. THE MACMILLAN RIVER, YUKON TERRITORY.

INTRODUCTION.

Having touched the spurs of the northern Rocky Mountains in the Ogilvie Range, it became of special importance to visit the same general region at a more southerly point. The region about the sources of the Macmillan and Stewart rivers fulfilled the required conditions. Therefore, on completing work in the Ogilvie Range in August, 1904, the remainder of the season, including the month of September and part of October, was devoted to a trip to the upper waters of the Macmillan River.

Our party was the same, Charles Sheldon, Carl Rungius, and myself, but during the trip up the river we were pleasantly associated



FIG. 2.—Map of Macmillan River region.

with a party of prominent citizens of Dawson. Among them were Mr. D. A. Cameron, of the Canadian Bank of Commerce, Justice L. A. Dugas, and Mr. J. Patterson. In addition, it was our good fortune to find bound for the same region the veteran hunter and African pioneer, Mr. Frederick C. Selous, of Surrey, England.^a We therefore joined forces and engaged a small steambot to take us to the head of navigation on the Macmillan. The season was well advanced, and the trip up the river consumed considerable time, leaving but little for actual work. Since the natural history of the region is so little known, such results as were obtained are deemed worthy of publication.

^a An account by Mr. Selous of this trip and of another made to the same region in 1906 has been published under the title, "Recent Hunting Trips in British North America," London, pp. 1-400, 1907.



FIG. 1.—NEAR TIMBERLINE ON PLATEAU MOUNTAIN. SUBALPINE FIRS IN FOREGROUND.

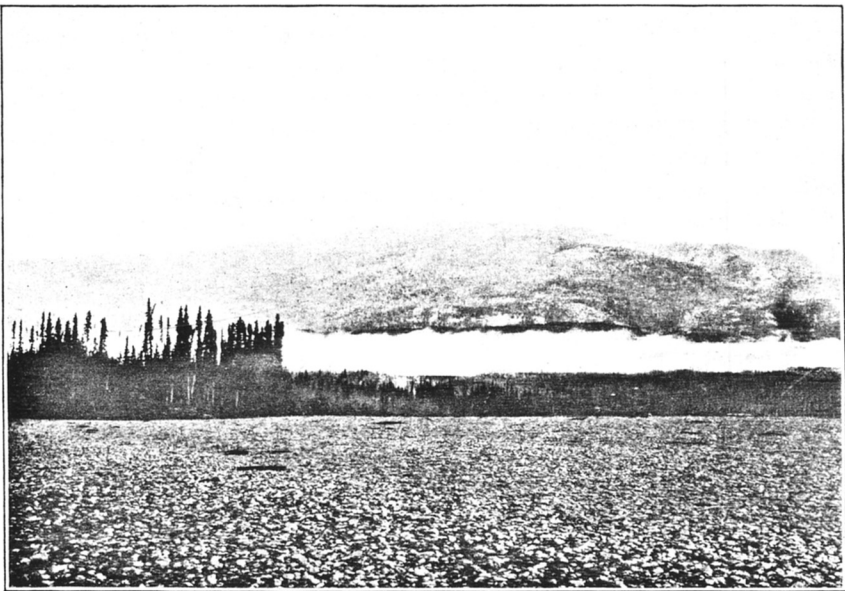


FIG. 2.—PLATEAU MOUNTAIN FROM MACMILLAN RIVER.

ITINERARY.

Our steamer left the wharf at Dawson at noon August 21. Progress upstream was slow, and Selkirk was not reached until 3 p. m., August 24. In a few hours we entered the Pelly and steamed up some 8 or 10 miles and tied to the bank for the night. On the evening of August 26 we reached the mouth of the Macmillan and proceeded up some distance. Delays were frequent, for the water was at a low stage and the channel unknown to the captain of the boat. Consequently we were often aground; moreover, much time was consumed in chopping wood for the furnace, as the boat could carry only a small supply of fuel. Finally on August 31 we left the steamer and took to our canoes a few miles below the mouth of Russell Creek and not far from the forks of the Macmillan. The next morning we worked up a short distance to a trapper's cabin just above the mouth of Russell Creek, where we were hospitably received by the owner, John Barr. Here our party divided. Sheldon and Selous proceeded up the North Fork of the Macmillan to the vicinity of the mouth of Husky Dog Creek, whence they worked into the mountains about the head of Clearwater Creek; Cameron, Dugas, and Patterson chose the South Fork, and hunted in the so-called South Fork Mountains; and Rungius and myself left the river immediately and proceeded into the Russell Mountains near the head of Russell Creek. We remained there until September 16, when we returned to Barr's cabin, and after a few days there dropped down the river to the base of Plateau Mountain. We worked near the river and on the mountain from September 20 to September 29. On the 29th we went on to Fish Lake, a small pond near the river and about 15 miles below our camp at the base of Plateau Mountain. Thence we moved on quite rapidly, making only brief stops, as the weather had become quite severe and the river was running heavy with slush ice. On October 5 we reached the junction of the Pelly and Macmillan and early on the morning of the 8th arrived at Selkirk. The next evening a steamer arrived from Dawson, and we took passage to White Horse and thence returned to 'the outside.'

GENERAL ACCOUNT.

Although actual work was confined to a few restricted parts of the region through which we traveled, it may be well to give some slight description of the whole route. This may be subdivided as follows: (1) The Pelly River,^a (2) the Macmillan River, (3) the Russell Mountains, and (4) Plateau Mountain.

^a Including only that part below the junction with the Macmillan.

THE PELLY RIVER.

The Pelly River joins the Lewes nearly opposite the present settlement of Selkirk. At its mouth it passes a basalt escarpment, about 200 feet high, which continues on down the north side of the Yukon for some distance, forming a conspicuous landmark. From this point to the junction of the Pelly and Macmillan is 46 miles in a straight line and 74 miles by the windings of the river.^a The stream, as may therefore be supposed, is very devious, particularly in the lower part of its course, where the country is uniformly low. It is from 400 to 800 feet wide, roughly speaking, and the current runs from 2 to 3 miles an hour, being somewhat slower than that of the Lewes or Yukon. About 60 miles above the mouth the current is swifter, and a few small rapids occur in passing through a narrow canyon some 3 or 4 miles in length. Above the canyon the current is again slack, and continues fairly uniform to the mouth of the Macmillan.

The country along the lower course of the river is very similar to that along Fiftymile River in the vicinity of White Horse, being for the most part dry and sparsely wooded. Low ranges of hills are in many cases almost bare of timber, being covered with grasses to their tops, with only scattered growths of poplar and small shrubs. Wide flats often stretch between the bases of these hills and the river, and where the exposure is to the south very little or no coniferous timber grows. One such flat not far from the mouth of the river has been cleared and put under cultivation.^b For about 20 miles below the canyon at least, one bank consists mostly of gravel and is about 50 feet high and uniformly level on top. It is usually grown to young poplars, with now and then an open slope covered with dwarf sagebrush (*Artemisia frigida*). The opposite bank is low and supports considerable spruce timber of average size, with some poplar and a little birch. Poplars (*P. tremuloides* and *P. balsamifera*) are the dominant trees, however. Occasionally the low bank is slightly swampy and permits a growth of black spruce (*Picea mariana*). The shrubs include dogwood (*Cornus occidentalis*), high-bush cranberry (*Viburnum pauciflorum*), buffalo berry (*Lepargyrea canadensis*), bearberry (*Arctostaphylos uvaursi*), dwarf birch (*Betula glandulosa*), alders (*Alnus*), and willows (*Salix*). At the head of the canyon a few lodgepole pines (*Pinus murrayana*) were seen, the first to be noted since leaving the Yukon. From that point on, they were seen at intervals all along the river, but seldom in large numbers. About the canyon the country is much the same, being dry

^a Dawson, Ann. Rept. Geol. Survey Canada, n. s., III, pt. I, p. 131B, 1889.

^b This place is only 4 miles from Selkirk and is known locally as The Farm. In the season of 1903, as I was informed, 100 tons of good oat hay were harvested here and marketed at a good price.



FIG. 1.—CHARACTERISTIC MEADOW IN UPPER MACMILLAN VALLEY.



FIG. 2.—BANK OF UPPER MACMILLAN RIVER.

and open, with considerable growth of poplar on southern slopes and more or less white spruce on northern. There are no mountains of consequence until within a few miles of the mouth of the Macmillan, though from one or two points just below the canyon glimpses may be caught of high peaks in the distance, evidently those of the Glenlyon range. Before reaching the Macmillan, Ptarmigan Mountain is passed. It is timbered practically to the top, although there are a few bare spots on one side. In the distance on the other side can be seen the Macmillan and Kalzas ranges. The tributaries which enter the Pelly below the Macmillan junction are very small, being only a few inches deep at low water.

THE MACMILLAN RIVER.

The Macmillan River from its mouth to the point where it divides into a north and south fork is about 150 miles in length. It is even more tortuous than the Pelly, the bends being shorter and more frequent. The current for the first half of its course is almost uniformly sluggish, seldom more than 2 miles an hour. Its upper reaches, however, are somewhat swifter, and short stretches running 4 to 5 miles per hour are not infrequent. Islands are not numerous, and the water is usually confined to one channel. At ordinary stages of water it is easily navigable for small steamers, the chief difficulty being in rounding the many sharp curves. It flows through a comparatively level valley from 2 to 6 miles in width and flanked on both sides by detached ranges of mountains. Its lower course closely follows the bases of the Macmillan and Kalzas ranges, from which it winds across and approaches the base of the mass containing the peak called Dromedary Mountain. From Dromedary Mountain to Plateau Mountain it traverses a broad, flat valley, for the most part heavily timbered, but with hundreds of small ponds surrounded by open grassy meadows scattered through it. It winds around the southern base of Plateau Mountain and continues through comparatively low country to the mouth of Russell Creek and to the Forks. The banks consist chiefly of clay and gravel alternating at intervals or associated in the same exposures. In the lower part of the river high clay banks are quite frequent. Where the river approaches the bases of the several groups of mountains, exposures of rock are more common. Its most important tributaries are Kalzas River, Moose River, and Russell Creek, which are separated by considerable intervals, but all of which come in from the northeast, draining from the broken plateau between the Macmillan and the Stewart.

A good growth of white spruce (*Picea canadensis*) occurs all along the river. There is also much black spruce (*Picea mariana*), for swampy conditions prevail in many places. Poplars are abundant, particularly on southern slopes, but are not so greatly in the ascendancy as on the Pelly. The paper birch (*Betula alaskana*) is fairly

common and often well grown. Pines also are common, and in some cases where burns have destroyed large areas of spruce, the second growth is almost entirely pine. The shrubs are practically the same as those along the Pelly. The white spruce grows in groves on the alluvial flats near the river and on the lower slopes of the mountains. These groves are usually rather small, but in places extend uninterruptedly for several miles. The amount of such timber in the entire valley is evidently considerable. The mountains on both sides are fairly well timbered, though all the higher peaks have more or less open treeless space on top.

THE RUSSELL MOUNTAINS.

The Russell Mountains consist of a small group of rather dome-shaped peaks lying on both sides and about the head of Russell Creek. The several peaks differ but slightly in height, being, according to McConnell, about 6,000 feet above sea level. One group lies between the main and the north fork of the creek, and is more or less continuous with the mountains at the head of Barr Creek and in general along the north side of the North Fork of the Macmillan. Another group is on the west side of Russell Creek and connected practically continuously with Plateau Mountain. These mountains form the divide between the Macmillan and the South Fork of the Stewart, the distance between the headwaters of Russell Creek and branches of the Stewart being only 2 or 3 miles. Russell Creek itself is about 12 miles long, so the total distance from the Macmillan in this region to the South Fork of the Stewart is not great.

The various peaks of the Russell Mountains, although close together, are for the most part separated by deep, narrow canyons, through which course small streams. Their sides are usually steep but fairly regular and, except on southern slopes, not heavily timbered, making travel laborious but not otherwise difficult. The valley of the upper part of Russell Creek between the two groups of mountains consists of long glade-like gullies and alternating ridges or narrow flats running parallel with the creek. These have been well timbered, but within a few years fire has passed over most of the region east of the creek, and it is now covered with dead spruce trunks and underbrush, largely willow and dwarf birch (*Betula glandulosa*). Besides these there are some buffalo berries (*Lepargyrea*), alders (*Alnus*), near water, and now and then a small patch of bearberry (*Arctostaphylos uvaursi*). In the canyons and along small streams the white spruce (*Picea canadensis*) has not been burned, and is abundant and of good size. It extends up the mountain sides on northerly exposures to about 2,000 feet elevation and on southerly to from 2,500 to 3,000 feet. Although it ascends to the upper limit of trees, it is greatly outnumbered at the higher elevations by the

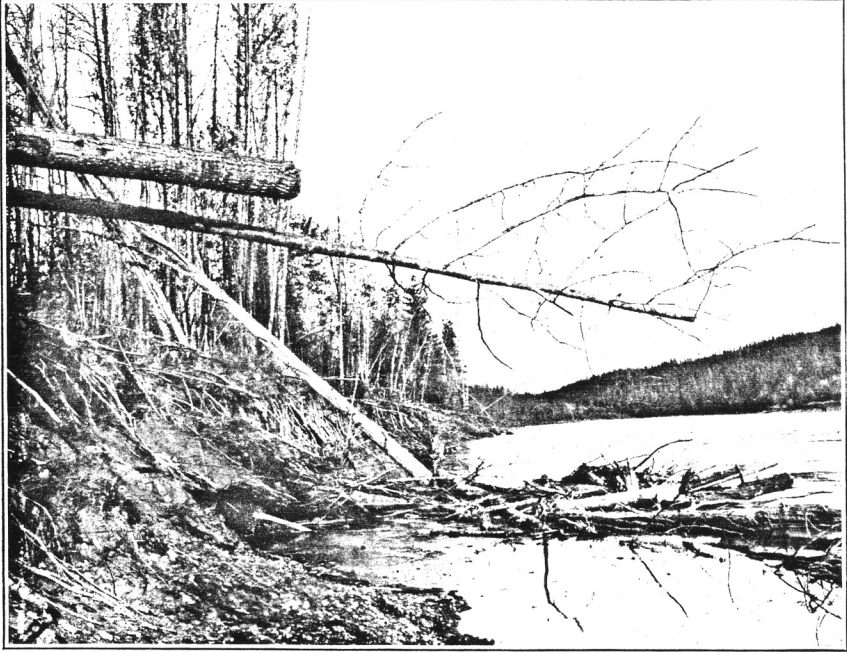


FIG. 1.—BEAVER LODGE IN BANK OF UPPER MACMILLAN RIVER, NEAR RUSSELL CREEK.



FIG. 2.—BEAVER DAMS NEAR UPPER MACMILLAN RIVER.

subalpine fir (*Abies lasiocarpa?*), which is for the most part the timberline tree. It is mixed with spruce at an altitude of about 1,500 feet, and to a less extent lower, and above that altitude it predominates. It often grows in beautiful groves about timberline, bordering small glades and meadows.

The deciduous trees are the poplars (*Populus balsamifera* and *P. tremuloides*), which are abundant along the banks of Russell Creek and for considerable distances back on the benches, and the paper birch (*Betula alaskana*), which is scatteringly distributed throughout the region. Along the lower part of Russell Creek, particularly on hot exposed benches, pines (*Pinus murrayana*) are abundant.

PLATEAU MOUNTAIN.

Plateau Mountain lies on the north side of the Macmillan, about halfway between Russell Creek and Moose River. Its elevation is about 6,000 feet, or practically the same as that of the Russell Mountains. The top of the main mountain, though somewhat uneven, is relatively level and roughly oblong, breaking off suddenly to steep slopes on its sides. On the northwest its slopes run down to Moose Lake, a beautiful sheet 6 miles or more in length. To the east and northeast, separated only by deep, narrow canyons, are similar mountains, which continue on toward the Russell Mountains.

Our camp was at the mouth of a small rushing stream, which comes down through narrow canyons on the south side of the mountain. The steep sides of the mountain at this point are very close to the Macmillan, being separated only by one or two narrow benches. The southern side is heavily timbered almost to the edge of the elevated plateau of the top. The southwestern slopes are covered with almost unbroken forest, chiefly of large white spruce, while somewhat to the eastward is a considerable area covered with second growth following a fire of former years, sufficient evidence of which now remains in the shape of standing and prostrate tree trunks. Much of the second growth is lodgepole pine, which is growing almost as thick as it can stand. Birch and poplar are fairly abundant, the latter being the dominant tree on the benches between the base of the mountain and the river. The northerly slopes also are heavily timbered, but not to such an elevation as the southerly ones. The top of the mountain and part of the northern slopes are treeless, and bear the usual mat of Arctic alpine vegetation and also numerous thickets of low willows. The subalpine fir (*Abies lasiocarpa*), as on the Russell Mountains, is the timberline tree, growing luxuriantly above the spruce forest. The ordinary shrubs—alders, willows, dwarf birch, high-bush cranberries, buffalo berries, and so on—are abundant.

MAMMALS OF THE MACMILLAN REGION.

Alces americanus gigas Miller. Alaska Moose.

The Macmillan region includes much ideal moose range, and as it is little frequented by man, the animals are fairly abundant. The broad flats near the river, with their heavy forests broken at frequent intervals by open swamps or grass-bordered lakes, as well as the flanking ranges and detached groups of mountains, with their sheltered canyons and open parklike glades alternating with thick clumps of trees, furnish all that moose desire. Nearly every member of the various parties in 1904 saw one or more moose, and a number were killed, including several very fine specimens.

During September and the early part of October they were found both at high altitudes on the mountains and on the banks of the river, but it was not possible to determine whether a general movement took place from the lower to the higher localities or vice versa. Since the period included the rutting season, when at least many of the males were roving, it seems probable that they were generally distributed most of the time. On September 2 I saw a small bull near timberline in the Russell Mountains, while on the same day, as I afterwards learned, Sheldon and Selous saw a cow and calf on the bank of the North Fork of the river. Again, Sheldon saw a cow and calf above timberline in the mountains between the North and South forks, while at about the same time Rungius and I saw several bulls and a cow and calf near the river at the base of Plateau Mountain. On October 3, while we were camped near the base of Lone Mountain, Rungius climbed a small peak near by and saw a spike bull and many tracks near timberline. During the day Sheldon and Selous came in from Plateau Mountain, where they reported having seen several young moose in the vicinity of timberline. No moose having been seen near the river for some days, the question of a general upward movement was therefore discussed, but that evening Gage, our camp man, went out with a small rifle to shoot muskrats and encountered a bull moose not 200 yards from camp, and a few days later on the Pelly another was seen within a few yards of the river bank.

The antlers of the old bulls are practically clear of velvet by the first week of September, while in the younger animals the process of changing may be delayed until the middle of the month. A large bull killed by Rungius in the Russell Mountains September 7 had perfectly hard but somewhat bloodstained horns, with a few small strips of velvet dangling from several of the points. Another killed by Selous on the North Fork September 8 was in similar condition, while a young bull killed at about the same time by Cameron's party had its antlers still fully covered with velvet. The height of the rut is appar-

ently about the third week in September. At that time a few bulls had their cows and many were still running.

Our only successes at calling moose with the birch-bark horn were about this time. The evening of September 20, when we arrived at the base of Plateau Mountain, before any disturbance had been made, Rungius and I took a horn and went about a quarter of a mile back from the river to a slightly elevated bench overlooking an extensive wooded flat, parts of which had been burned, leaving a few open spaces. Rungius, who had had experience in calling moose in New Brunswick, handled the trumpet. After the fourth call, a faint rattle of horns was heard in the distance perhaps half a mile away. Another call, and the horns rattled again, this time apparently a little nearer. The intervals between calls were lengthened, and evidence that a moose was coming directly toward us was soon conclusive. No animal but a moose could make such a noise. For a time all would be deathly still and then, crash! as the horns rattled their challenge against the resonant branches of a dead tree, sounding like nothing that I could think of so much as the breaking of rather thin ice. Sometimes the rattling continued for several seconds, and one could readily imagine the noise as caused by a heavy animal floundering through ice in a shallow pond. After some minutes the animal was but a few hundred yards from us and the rattling ceased and we began to hear short, grunting coughs. Meanwhile more rattling was heard from another direction, announcing another bull, which came on more slowly and cautiously, being, as we supposed, an older animal. During the intervals between coughs we strained to hear the big beasts that we knew were moving about very near us, but not the slightest sound was heard. Suddenly we were startled by a series of coughs right at our feet, so to speak, and we realized that a bull moose was in a small thick clump of trees just below our station on the bench and scarcely 30 yards away. It was rapidly getting dark, and after a whispered consultation we decided upon a quick descent to the clump of trees below, when the ghostly form of a huge moose carrying monstrous antlers appeared in one of the partly open burnt areas about 300 yards away. He stalked majestically across among the dead tree trunks, apparently coming nearer, but suddenly turned and disappeared among the thick trees beyond. Meanwhile the other bull also had moved away. It was a most interesting experience, and settled to my entire satisfaction the claim, denied by some, that the western moose responds to calls just as his eastern relative does. In the frenzy of sexual excitement, moose sometimes are attracted by various sounds, as those of chopping wood or other noises about camp, but in this case everything seemed to indicate that the two bulls came to the call because they thought it was what it purported to be. Possibly

a moose in his right mind could recognize the best imitation man could make, but during the rutting season, if he comes to any call, it would seem that a moose call, cow or bull, would be most likely to attract. That the call given by Rungius was a good imitation I feel certain, for only a few days later I heard the actual call of a cow not three minutes after seeing her enter the woods. It was so much like the imitation that I was not satisfied of its genuineness until Rungius assured me that he had not been in the woods playing a joke on me.

John Barr, a trapper on the upper Macmillan, told us he had been very successful in hunting moose with a small mongrel dog. The dog was readily trained to follow a fresh trail and bring an animal to bay, and by barking and snapping to hold it until the hunter arrived with his rifle. Thus in several seasons of trapping he had never lacked for a supply of meat for himself and his dogs. In winter moose collect in considerable numbers in certain areas in this region, possibly 'yarding,' as the eastern moose does. According to reports which Selous received, moose were very numerous along Russell Creek in the winter of 1905. Once 11 were seen together, 9 bulls, 1 cow, and a calf, and at another time 25 were in sight at one time, scattered about browsing.

The moose of the Macmillan region average almost, if not quite, as large as those of the Kenai Peninsula. The height at the shoulder in three full-grown bulls measured (between uprights) by Selous was, respectively, 6 feet 9 inches, 6 feet 10 inches, and 6 feet 11 inches. The largest of three bulls from the Kenai Peninsula measured by Dall De Weese was 6 feet 8 inches in height at shoulder. The antlers of the Macmillan moose also average large, although none were secured having a spread of more than 67 inches. But it must be remembered that the antlers that spread 70 inches and more are selected specimens from the Kenai region. The largest moose killed by Selous on the North Fork carried an exceptionally massive pair of antlers, with a spread of 67 inches. The dried skull and antlers together weighed 75 pounds. The other heads obtained in 1904 spread as follows: 48 inches, 50 inches, 53 inches, 56 inches, 58 inches, and 64 inches. The skulls of the Macmillan moose do not have such broad palates as those from the Kenai Peninsula, and differ but little from the eastern moose in this respect.

***Rangifer montanus osborni* Allen.** Osborn Caribou.

Caribou inhabit practically all the mountains of the Macmillan region which rise above the limit of tree growth. Our first sight of them was on the evening of August 29, when our little steamboat was tied to the bank of the river for the night a short distance from the base of Plateau Mountain. The air was clear, and with the aid of glasses the antlered forms of several caribou were clearly seen against

the sky, moving about like strange insects on the sharply defined crest of the mountain. From later experience we learned that this mountain is a favorite resort of caribou. They proved to be still more abundant, however, in the so-called South Fork Mountains, lying between the South Fork of the Macmillan and the Pelly River. Cameron and his party, who hunted in these mountains, brought out some very fine heads, and reported seeing numbers of caribou. In the fall of 1906 Selous also found caribou plentiful in the South Fork Mountains. The day after our arrival in the Russell Mountains a band of nine cows was located, and one was killed to supply the camp with meat; but in the following ten days, during which the region was thoroughly traversed, no other caribou were observed. Occasional tracks were seen, some on the open ridges and some on the sparsely timbered slopes lower down, but no well-worn trails appeared, and it was evident that caribou did not frequent the region in numbers.

On September 21 we climbed Plateau Mountain and found its broad top covered with a few inches of snow, acres and acres of which were imprinted with caribou tracks about two days old. Just how many animals had made them we could not determine, but there must have been hundreds. After hunting carefully over most of the upper part of the mountain, we were about to conclude that all the caribou had gone down into the timber when Rungius turned his glass upon an object on the northeast side of the mountain that we had taken for a large brown rock, but which proved to be a very large solitary bull caribou lying down dozing. In fact, he was nearly fast asleep, for now and then his head nodded until his nose touched the ground. Stalking him was therefore simple. At the crack of the rifle he rose slowly to his feet, tottered a moment, reared wavering in the air, and fell almost completely over backward dead. He was an immense animal, and we estimated that his live weight was between 500 and 600 pounds. He was very old and perhaps an out-cast. Two incisor teeth were all that remained, and his horns, although with very heavy long beams, had few points.

A few days later we hunted again on the top of the mountain and again were about to conclude the caribou had left for other parts when a single small bull came running up the north side of the mountain from the timber below. He was some 500 yards away and his course led him directly into the wind, so he soon stopped and after a few snorts and wild prancings from side to side went speedily on over the top of the mountain. Later two more were seen, one of which was killed. The other bull lingered in the vicinity running wildly about, and more than once, as I was skinning his dead comrade, he came within 75 yards and stood looking curiously at me, a good example of failure to recognize danger.

Our experience on Plateau Mountain thus proved that the caribou move back and forth from the timber to the mountain tops. We saw no caribou in the timber, however, and tracks were scarce there except at considerable elevations. Possibly, therefore, the animals traverse the heavily wooded valleys only in crossing from one mountain to another. Judge L. A. Dugas, while descending the river with Cameron and their party, killed a large bull caribou on the bank of the Macmillan between Russell Creek and the base of Plateau Mountain. This was the only caribou seen in the timber in 1904 by any of the hunters in the region.

The caribou of the Macmillan region are referable to *R. m. osborni*, a member of the so-called Woodland Group. Yet in habits and in nearly all respects save size they seem scarcely to differ from the caribou of the Ogilvie Mountains (see p. 49), which are distinctly referable to the Barren Ground Group. *R. arcticus*, of the Ogilvie Mountains and northward, is scarcely less a 'mountain caribou' than *R. m. osborni*. Both enter the timber to some extent, but their particular range is on the treeless ridges and high slopes above timberline. Between the Macmillan region and the Ogilvie Mountains lies much practically uninterrupted mountainous country of uniform character undoubtedly inhabited by caribou. It is therefore difficult to believe that a sharp line exists separating *osborni* from *arcticus*. The material for elucidating this problem does not exist in any museum, but it seems probable that our northwestern caribou, like the sheep, will eventually prove to intergrade, so that the forms now known as species will rank only as subspecies.

Although the antlers of all caribou are exceedingly variable, certain average distinctions are fairly well marked. Among some 15 pairs of antlers from the Macmillan region, a general tendency to long rangy beams appears, which may be in the nature of a gradation toward *arcticus*. None of them possess the short heavy type of antler with much flattened beam which seems almost characteristic of *R. montanus*, and which is found also in certain specimens of *R. m. osborni* from the type locality. The skull of the large male from Plateau Mountain presents the following measurements: Basilar length 425; tip of premaxillæ to tip of nasal 138; length of nasals 155; zygomatic width 149; palatal width at m1 74; alveolar length upper toothrow 100; postpalatal length 151; posterior edge of palate to tip of premaxillæ 275; length of mandible, incisive border to angle, 334; depth of mandible at m2 43; alveolar length mandibular toothrow 107. The length of the beam of the antlers of this specimen is 1,240 mm. (about 50 inches). The beams in five specimens from the South Fork Mountains as recorded by Selous are, respectively, 45 inches, 51 inches, 51 inches, 55 inches, and 57 inches.

Ovis dalli stonei Allen. Stone Sheep.

Mountain sheep occur in small numbers on most if not all the mountains of the Macmillan region, becoming more numerous toward the headwaters; probably they are most abundant about the extreme sources of the river in the Selwyn Range, which we were unable to reach. A few are said to inhabit the Kalzas Range, and it is not unlikely that some frequent Dromedary Mountain also, but neither of these localities was visited by our parties. We found no sheep on Plateau Mountain, but that they occasionally reach it from the ranges lying beyond is scarcely to be doubted. A few live in the higher parts of the Russell Mountains. We did not succeed in sighting any there, however, although tracks of about a dozen were seen. Sheldon and Selous found them more plentiful in the mountains between the North and South forks. Although they did not succeed in getting adult males, several females and young males were obtained. These, as stated elsewhere (see p. 52), proved to be exceedingly variable, some being only slightly darker than typical *dalli*, while others have the body and legs practically as in *stonei*. Individual specimens can be determined according as they are more like *dalli* or *stonei*, but to classify the sheep of the region collectively is practically impossible. The same difficulty is met if one attempts to recognize *fannini* as a form intermediate between *dalli* and *stonei*, for no locality in the intervening area has been found where sheep with uniform characters occur.

Peromyscus maniculatus arcticus (Mearns). Arctic White-footed Mouse.

White-footed mice occur on the Pelly at least as far up as the mouth of the Macmillan, as attested by a specimen collected there by Sheldon in 1905. Farther up the river, where trapping was done in 1904, no white-footed mice were taken.

Eutamias caniceps Osgood. Gray-headed Chipmunk.

Two specimens taken on Plateau Mountain are typical of this species. Chipmunks were not seen farther up the Macmillan than Plateau Mountain and only rarely between that point and Selkirk.

Sciurus hudsonicus Erxleben. Red Squirrel.

Generally distributed and fairly common in the spruce timber. A few specimens were collected near the forks of the Macmillan.

Citellus plesius (Osgood). Ground Squirrel.

Fairly common in the vicinity of timberline in the Russell Mountains; reported also from the mountains on both sides of the North Fork of the Macmillan by Sheldon and Selous. Although hibernating had apparently begun to some extent, the animals were still active in considerable numbers. In spite of several light falls of snow, many of

their burrows were kept open and numerous tracks in the snow were seen as late as September 6. Unfortunately no specimens were secured, but the identity of the squirrels is scarcely to be doubted. A small series taken on Ross River near the Pelly in 1905 by C. Sheldon are typical of *plesius*. Thus the range of this species, discovered less than ten years ago, is now known to be quite extensive, covering a wide area between the region of the Stikine River (about latitude 56° N.)^a and the Ogilvie Range (about latitude 65° N.).

Marmota caligata (Eschscholtz). Hoary Marmot.

The whistler was not seen by our party, but trapper John Barr reported that it occurs in the Russell Mountains and adjacent detached ranges. Probably it was in hibernation at the time we were in the region.

Castor canadensis Kuhl. Beaver.

Signs of beavers, fresh cuttings, newly made bank houses, and dams were found at short intervals all along the Macmillan from the mouth of the Kalzas River to Russell Creek; many more were noted on the North Fork by Sheldon and Selous and on the South Fork by Cameron and his party. It is perhaps a fair estimate that not less than 300 beavers were living on the Macmillan and its tributaries in 1904. Until that time the few white trappers in the region had devoted themselves almost exclusively to the easier and more profitable task of catching martens, and as scarcely any Indians visited the locality, the beavers remained undisturbed. Mr. Selous on his return in 1906 found that trappers had visited the region, for the beavers, though still fairly common on the upper courses of the river, were much less numerous than previously. One trapper informed him that he had caught 43 in a few weeks, and that a party of Indians from the Little Salmon River had taken many more.

Apparently the majority of these beavers lived in houses on the banks of the main channel of the Macmillan, but numbers also inhabited small tributaries and backwaters, where they constructed dams and sometimes built large dome-shaped houses. The bank houses were of a simple crescentic or roughly semicircular lean-to style, and consisted of a network of sticks of various sizes and lengths and a

^a Specimens from the Stikine region recorded by J. A. Allen (Bull. Am. Mus. Nat. Hist., XIX, pp. 534-537, 1903) as *Citellus erythrogluteius* are doubtless referable to *C. plesius*. Since the type locality of Richardson's *erythrogluteia* is said to be in latitude 57° N., it is not strange that Doctor Allen should suppose his Stikine specimens to represent that animal. However, Doctor Merriam informs me that the latitudes given by Richardson for specimens collected by Drummond are erroneous and that the head of the Elk River, the type locality of *erythrogluteia*, is much farther south than latitude 57° N. Specimens of true *erythrogluteius* from very near the type locality are in the Biological Survey collection and show it to be allied to *C. columbianus* rather than *C. plesius*, a fact which was considered when *C. plesius* was originally described.

few small logs, the whole chinked with earth or sometimes almost completely covered. These were placed against the bank, which thus forms one side of the hollow where the animals live and to which their only access is by water. During September the beavers were busily engaged laying in the winter supply of food, and their miniature clearings, where from two to a dozen trees had been felled on the bank near their houses, frequently drew attention to the houses themselves; for these, until closely examined, often appeared to be a part of the bank. The trees cut were from 4 to 16 inches in diameter and invariably were aspens or balsam poplars. By October 1, when ice was beginning to form along the edge of the river, a large supply of small poplar branches had been gathered and tightly packed in great masses under the water about the bases of the houses, whence they could easily be drawn into the houses during the winter and eaten as needed.

Evotomys dawsoni Merriam. Dawson Red-backed Mouse.

A few red-backed mice were taken in the Russell Mountains and a few at the base of Plateau Mountain, but it was evident that during the season of 1904 they were comparatively uncommon throughout the region. The specimens are of interest, since the localities are relatively near the type locality (Finlayson River) of the species. A locality still nearer (Ross Lake, near the Pelly River) is now represented by specimens in the Biological Survey collection, presented by C. Sheldon. They do not differ appreciably from specimens from the Lewes River region, heretofore assumed to be typical of *E. dawsoni*.

Microtus pennsylvanicus drummondi (Aud. and Bach.). Drummond Vole.

Numerous runways doubtless made by voles of this species were seen in many of the grassy swamps along the Macmillan, but very few of them showed indications of recent use. Evidently the mice had moved to other quarters, or possibly they had been visited by disease. Three specimens were taken in the Russell Mountains and three at the base of Plateau Mountain.

Fiber zibethicus spatulatus Osgood. Northwest Muskrat.

Fairly common. A few live in the banks of the river, and others frequent the grass-bordered ponds so numerous in the level parts of the valley.

Synaptomys borealis dalli Merriam. Dall Lemming Mouse.

Five specimens were taken in a sphagnum swamp near the mouth of Russell Creek. These appear to differ from typical *borealis* only in slightly lighter color. Immature examples of the two forms are scarcely distinguishable.

Lemmus helvolus yukonensis Merriam. Yukon Lemming.

A single lemming was caught in a sphagnum swamp near the mouth of Russell Creek. In this specimen the audital bullæ are slightly smaller than in *yukonensis*, the color is a shade paler, and the sides are more extensively ochraceous. The variation in all these respects appears to be toward typical *helvolus*,^a of which *yukonensis* therefore may be considered a subspecies.

Erethizon epixanthum myops Merriam. Porcupine.

One was seen on Plateau Mountain by Sheldon and Selous. No others were noted, although doubtless they are generally distributed.

Lepus americanus macfarlani Merriam. MacFarlane Varying Hare.

Very abundant throughout the region, particularly on the wooded flats near the river. It was not uncommon to start up several at once, and toward evening in a favorable spot one might see a half dozen in as many directions quietly sitting or moving about in the brush. Three adult males taken near the base of Lone Mountain October 3 are in changing pelage and show considerable white. When killed they weighed, respectively, 3½ pounds, 3½ pounds, and 3¾ pounds. Others were taken on Russell Creek and on Plateau Mountain. The identification of these was made by E. W. Nelson.

Lynx canadensis Kerr. Canada Lynx.

The belief that the abundance of lynxes in a given region is proportionate to the number of hares was borne out by the conditions in the Macmillan region in 1904. Wherever hares were common, lynxes appeared in numbers. Not only were many lynx tracks observed, but the animals themselves were frequently seen. One seen by Rungius was just in the act of pouncing upon a hare. Descending the river in our canoes in October we often swung noiselessly around a bend and saw a lynx on the shore a few hundred yards ahead. It would stand eyeing us for a few moments and then bound swiftly into the woods, its hind quarters always seeming ludicrously high and disproportionate.

Canis albus Sabine. Northern Wolf.

One seen for a moment on the bank of the river as we were descending, in October, was the only wolf met with by our entire party, and tracks were very scarce. Two skulls were obtained by Sheldon at a trapper's camp on the North Fork. On his second trip, in 1905, Mr. Selous saw several, and killed two large males in the mountains above the forks of the Macmillan. One of these was

^a Two specimens in the Biological Survey collection from Glenora, British Columbia, have been used to represent *helvolus*. These, although taken at some distance from the type locality, agree fairly well with the type specimen examined by me in London in October, 1906.

discovered feeding on a caribou carcass and the other met death at only 20 yards' distance while trotting along a game trail. One was quite black and the other grizzled. The proportion of black or nearly black wolves among those killed throughout the upper Yukon basin is noteworthy. A large number of black wolf skins were seen hanging in various stores in Dawson and in Selkirk and other small places.

***Vulpes fulvus* subsp. Fox.**

Trappers report that foxes are scarce in the Macmillan region. A single fox track was seen in fresh snow on top of one of the high ridges of the Russell Mountains September 6. Later, as we were descending the river, a cross fox was seen on a gravel bank of the lower Pelly near the mouth of Mica Creek.

***Ursus horribilis* Ord. Grizzly Bear.**

A young female grizzly bear was killed by Rungius, September 12, while it was feeding on the carcass of a caribou, killed a few days before, in a small hollow near the top of a high treeless ridge in the Russell Mountains. This bear was probably in its third year and measured 5 feet 8 inches in total length. Another grizzly, apparently much larger, was seen standing near the bank of the river at Porphyry Bluff September 20. Just as we sighted him our canoe ran into a short stretch of difficult water, and the swift current whisked us out of range before we could get ready to shoot. Two days later I saw two good-sized grizzlies on the open gravel beach opposite our camp at the base of Plateau Mountain, but having no gun at the moment I regretfully watched them lope away into the near-by willow thickets. The other parties saw no grizzlies, but it is evident they were fairly common in the region. The skull of a very large male killed the previous season was secured from John Barr, the trapper located near the mouth of Russell Creek.

***Ursus americanus* Pallas. Black Bear.**

On our way up the Pelly and Macmillan we saw no bears, as the puffing steamboat gave ample warning of our approach, but returning quietly with the current in canoes, each party encountered several, mostly black bears. Before we entered the Pelly, however, a small coal-black bearskin was brought aboard by a native, who secured it near the Yukon a few miles below the mouth of the Pelly. A dark brown 'cinnamon' bear was killed in the Russell Mountains by Rungius September 13. The day before, our camp man had gone to the carcass of a freshly killed moose to bring in some meat, and found it partly eaten and almost entirely buried in moss and refuse with signs of bear all about; in fact it was evident his coming had startled a bear away from it. The carcass was in thick woods where

quiet approach was very difficult, but the next day Rungius made a careful stalk and found the bear sleeping by his cache, although apparently with one eye open and dreaming of trouble, for at the crack of a twig he started up, to be met with a bullet. Several days before, a bear, possibly the same one, visited our main camp and carried away a hind quarter of caribou meat and a moose scalp while we were temporarily camped higher up in the mountains. On some of the flats near the Macmillan bears were evidently quite common, for we found many tracks there and not infrequently considerable areas that had been thoroughly explored for roots, insects, and berries. A small black bear, scarcely more than a cub, was seen September 20 on a large jam of logs a few miles below Russell Creek. On sighting us he disappeared among the logs and managed to thread the labyrinth unseen and scamper across several rods of open flood plain to the woods in the few seconds that we spent in landing the canoe. A good-sized black bear was seen some days later on an open hillside near the mouth of the Macmillan. We landed two of the canoes on the opposite side of the river, and watched while Selous crossed to the other bank and started to stalk the bear. It could not see him and evidently had not noticed us but, although the wind appeared to be favorable, it soon threw up its head and swung it about, sniffing characteristically, and then beat a hasty retreat.

Lutra canadensis (Schreber). Otter.

Trappers report that otters are scarce in the Macmillan region. None of our party saw any signs of them.

Lutreola vison energumenos Bangs. Northwest Mink.

Generally distributed, but nowhere especially common. Two individuals were seen running along the icy bank of the lower Macmillan October 4.

Putorius arcticus Merriam. Arctic Weasel.

An adult male was taken in a cabin near the mouth of Russell Creek. It poked its head out between the small poles of the floor and quietly surveyed a party of us as we sat in the candlelight one evening after supper. It then vanished for a moment and reappeared with its mate, and the pair ran about the room for some minutes as unconcernedly as if we had not been there. Later in the night, after we had gone to bed, it stepped into a trap set in the corner of the room and awoke us by its shrill cries. Trappers report weasels as fairly common, but they seldom make special effort to catch them, as other furs are more profitable. They encourage weasels to live about their cabins, making pets of them and greatly valuing their services in keeping the premises free from mice.

The above-mentioned specimen is referred to *P. arcticus*, although not quite typical of that species. Its skull is smaller and slightly narrower interorbitally than in typical *arcticus*, which may indicate gradation toward *alascensis* or *richardsoni*.^a The rostrum is nearly as broad as in *arcticus* and not so narrow as in *richardsoni*. The skin is rather pale in color and agrees with many specimens of *arcticus*. The amount of black in the tail is about the same as in *alascensis*, but the basal part of the under side of the tail is yellowish white as in *arcticus*. Specimens from Stuart Lake, British Columbia, seem to be intermediate between this Macmillan specimen and *richardsoni*, while possible intergradation with *alascensis* is shown by a specimen from the vicinity of Fort Selkirk, Yukon.^b Therefore, although the evidence is not yet conclusive, it seems highly probable that future collections from northern British Columbia will demonstrate close interrelation of *arcticus*, *alascensis*, and *richardsoni*.

***Mustela americana actuosa* Osgood. Marten.**

The Macmillan region in general is known to trappers as "good marten country." At least 6 men worked there in the season of 1904-5. John Barr, whose hospitality we enjoyed for a few days at his camp near the mouth of Russell Creek, says that a good trapper may get as many as 300 marten in a season. It is necessary, however, to select new ground each season, and the work of finding a favorable region, cutting trails, building cabins, and laying in supplies occupies a good part of the summer.

We noted considerable sign of martens in the vicinity of Russell Creek, and two of the animals were found by Rungius feasting upon the carcass of a moose killed by him. He reports that they were quite fearless, standing upon the carcass and chattering at him until he went away, leaving them in possession. A very large series of skulls was obtained, including many fine adult males, which agree very closely with typical examples of *M. a. actuosa*. The range of this subspecies is therefore much more extensive than was formerly known.

***Gulo luscus* (Linn.). Wolverine.**

A wolverine was killed by Rungius while it was tearing at the carcass of a caribou on an open slope near the top of Plateau Mountain. It came up to the carcass while we were watching from above, evidently having been there before, as it came out of the woods on the run and made a direct line for the carcass. It immediately

^aThe name *microtis* has been proposed (Allen, Bull. Am. Mus. Nat. Hist., XIX, p. 563, 1903) for a weasel from Telegraph Creek, British Columbia, to which also the Macmillan specimen may be allied.

^bSee N. Am. Fauna No. 19, p. 43, 1901.

began to tear frantically at the neck, but soon attacked the paunch, all its actions being quick and nervous as if it were in a sort of frenzy. It was not possible to get nearer than 125 yards without being seen, but the voracious beast was struck in the body at the first shot. Although mortally wounded, it began to work its way down the mountain, falling down every few feet and turning and snarling most viciously several times as Rungius ran in to finish it. This was the only wolverine seen by any of the four hunting parties in the region, and but few tracks were reported.

BIRDS OF THE MACMILLAN REGION.

Larus argentatus Pontop. Herring Gull.

Two birds in gray plumage were seen on the lower Pelly, August 25, near some rocks in midstream known as Gull Rocks, because a few of these birds breed there. A single bird was seen near the canyon of the Pelly, flying up and down over the dreary ice-laden river October 7. It followed our canoes for a time, and at our lunch camp gave such evidence of hunger that the cook threw it a bit of frozen moosemeat. The bird devoured an incredible quantity of meat which was thrown to it, appearing almost famished. One other gull, also immature, was seen on the Macmillan near Fish Lake October 1.

Mergus serrator (Linn.). Red-breasted Merganser.

Fairly common along the Pelly and Macmillan. A flock of about half a dozen birds, doubtless a family, was seen near the mouth of the Pelly August 25. Others were noticed from time to time, usually flying up or down the river. Sheldon reports them common on the north fork of the Macmillan. Once as we were coming down the river near the base of Plateau Mountain a small flock was seen swimming a short distance ahead of us. On seeing our boat approaching, they swung in to the shore, and as we passed we could see them swimming upstream against a strong current with all but their heads submerged. They kept within a few inches of the shore, and took particular pains to go inside of all the numerous snags and drift logs that might protect them from our view.

Anas platyrhynchos Linn. Mallard.

Mallards were seen quite often, but never in large numbers. The following records are entered in the notebook: Lower Pelly, August 25, about a dozen; near Fish Lake, Macmillan River, August 29, one killed from a flock of five; Macmillan River, August 30, eight or ten birds seen; near Porphyry Bluff, September 20, several seen; near mouth of Moose River, October 1, a flock of eleven; along base of Kalzas Range, October 4, several singles and pairs; mouth of Macmillan, October 5, one pair.

Mareca americana (Gmel.). Widgeon.

Several small flocks fed about the grassy borders of a large pond near the mouth of Russell Creek. Three birds were killed here September 16 for the sake of varying our steady diet of moosemeat.

Nettion carolinense (Gmel.). Green-winged Teal.

Only occasionally seen. A flock of 9, from which 5 were killed for the pot, was found on a long bare gravel bar on the upper Macmillan near Porphyry Bluff September 20.

Dafla acuta (Linn.). Pintail.

Seen only once, on October 5, when a flock of four flew over near the mouth of the Pelly.

Marila affinis (Eyt.). Lesser Scaup.

A small flock of about a dozen scaups was seen near Lone Mountain October 2. One was killed a few miles farther down the river October 4. A few others, probably this species, were seen by various members of our party.

Branta canadensis hutchinsi (Rich.). Hutchins Goose.

Rather common along the Macmillan, but not seen on the Pelly. The first observed were a flock of about 20 on a gravel bar near the mouth of Kalzas River August 27. From that point to the Forks several flocks were seen every day or heard cackling as they arose in alarm at the sound of the puffing steamboat. A large flock of about 50, flying high in regular formation, was seen going southward September 19 near the mouth of Russell Creek.

Olor columbianus (Ord.). Whistling Swan.

No swans were seen, but the soft musical call notes of a flock flying in the distance were heard as we sat around the camp fire on the lower Pelly on the evening of October 6.

Grus canadensis (Linn.). Little Brown Crane.

A flock of about 30 was seen by Rungius on upper Russell Creek September 30. Another high-flying flock was heard near the base of Plateau Mountain September 28. A few days later, on the bank of the river in the same vicinity, one was killed by F. C. Selous. It was standing by the carcass of a moose that was under surveillance in the hope that it might be visited by a bear. Whether the bird also had designs upon the carcass or not was not demonstrated.

Gallinago delicata (Ord.). Wilson Snipe.

A solitary snipe, the only one seen, was collected on the muddy bank of a small slough near the mouth of Russell Creek September 17.

Heteractitis incanus (Gmel.). Wandering Tatler.

While hunting big game on one of the higher peaks of the Russell Mountains, September 4, a strange shore bird was seen. Another, apparently of the same species, was seen by Rungius, also on a high slope far above timberline. On the next day Rungius directed my attention to a bird near camp along the creek. It proved to be a tatler, an immature bird with down still attached to the feathers of the neck.^a It seemed strangely out of place, busily engaged as it was, running hither and thither over the small patches of gravel and stones along the rushing mountain stream.

Actitis macularia (Linn.). Spotted Sandpiper.

Scattering individuals were seen all along the river from the mouth of the Pelly to the upper Macmillan, August 25 to 30. A single much belated bird was observed near the mouth of Moose River October 1.

?Dendragapus obscurus subsp. Blue Grouse.

D. A. Cameron, of Dawson, who was with our party for a time, tells me that he killed on the South Fork of the Macmillan a bird which he thought was a blue grouse. It was shot with a large-bore rifle and much mutilated, so no attempt was made to preserve it. Mr. Cameron seemed positive that it was not the spruce grouse, with which he is very familiar. I heard of the occurrence of this bird in the region from various trappers and prospectors, many of whom grew up in the blue-grouse country in the northwestern United States, and knew the bird well before they went north. In view of these reports, I feel certain that it will sooner or later be collected in this region.

Canachites canadensis osgoodi Bishop. Alaska Spruce Grouse.

Apparently quite common in the Macmillan region, although but few specimens were secured. In the Russell Mountains one or two were seen now and then in the few patches of green timber that had escaped the ravages of fire. Near the mouth of Russell Creek, in heavy spruce timber, it was very common about the middle of September. Not more than four or five birds were seen together, however. The crops of all those killed were well filled with high-bush cranberries (*Viburnum*), which occur in abundance.

Bonasa umbellus umbelloides (Dougl.). Gray Ruffed Grouse.

A pair was flushed August 29 on a low hillside in a thin growth of poplars near Fish Lake, Macmillan River. They flew rapidly, and apparently were as much alarmed as if they had been hunted for years. No more were seen until September 19, when another pair

^a See *The Auk*, XXIV, p. 340, 1907.

was flushed and one was killed in a thick growth of poplars near the mouth of Russell Creek. They are said to be quite common in certain localities along the lower Pelly.

Lagopus lagopus (Linn.). Willow Ptarmigan.

Seen in the Russell Mountains in very small numbers, being much less common than the rock ptarmigan. One pair was observed near the head of Gorge Creek September 3, and a flock of about 15 birds was flushed from some low willows near the head of a branch of the South Fork of the Stewart River September 11. No others were noted with certainty, though some may have been associated with the large flocks of rock ptarmigan seen.

Lagopus rupestris (Gmel.). Rock Ptarmigan.

Quite common and gathered in large flocks in the Russell Mountains in September. Flocks of 50 to 100 birds were seen frequently in the higher parts of the mountains. Similar large flocks were observed on Plateau Mountain. Sheldon reported them abundant also in the mountains on both sides of the North Fork of the Macmillan. Although the mountains were covered with fresh snow, entirely hiding the greater part of the vegetation, the ptarmigan still frequented to some extent the tops of the peaks and ridges. They were feeding mainly on willow buds, and seemed to prefer the plants growing at the highest elevations, although plenty of similar food was available lower down. The birds were exceedingly wild, the wildest of their kind that I have ever seen. Almost invariably they flew at 300 to 500 yards and even farther, and did not alight again for half a mile, or at least until out of sight behind an intervening hill. The snow was rather earlier than usual, and many of the birds had only begun to acquire the white plumage; so they were quite conspicuous. Whether they instinctively perceived the lack of protective coloration and the consequent danger to themselves can only be conjectured, but that they were unusually wild is beyond doubt.

Pediceetes phasianellus (Linn.). Sharp-tailed Grouse.

Residents of Selkirk and the lower Pelly region aver that this bird, which they call the pin-tailed grouse and pin-tailed chicken, is frequently killed in that region. In June, 1903, I picked up a wing and a few characteristic feathers of a sharp-tailed grouse at a wood chopper's camp on Thirtymile River. The character of the country is much the same as at Selkirk, and it is not very far distant; so the bird doubtless occurs in the Pelly region.

Circus hudsonius (Linn.). Marsh Hawk.

Several were seen along the lower Pelly August 25 and 26. Not noted elsewhere.

Accipiter velox (Wilson). Sharp-shinned Hawk.

One shot on upper Russell Creek September 4 was the only one seen.

Astur atricapillus (Wilson). Goshawk.

We saw hawks of several species in considerable numbers between the mouth of the Pelly and the mouth of the Macmillan, both while ascending the river about September 1 and while descending about October 1. The majority of those that could be identified were goshawks, most of them in immature plumage. They were seen quite often along the Macmillan—one at the base of Plateau Mountain September 28, one 10 miles below Plateau Mountain September 29, one near the mouth of Moose River October 1, and two along base of Kalzas Range October 4.

?Buteo borealis calurus Cass. Western Redtail.

Although not positively identifiable at a distance, several of the hawks seen by us on the lower Pelly were apparently redtails.

Archibuteo lagopus sanctijohannis (Gmel.) Rough-legged Hawk.

Several were seen soaring over the banks of the lower Pelly August 25. They doubtless feed largely on ground squirrels, which are abundant in this region. One was seen on the lower Macmillan August 28 and another near the base of Plateau Mountain September 29.

Aquila chrysaëtos (Linn.). Golden Eagle.

Golden eagles, usually single birds, were seen at long intervals. One was noted at the mouth of the Pelly August 21, one in the Russell Mountains September 3, and another on Plateau Mountain September 23. An immature bird was killed on the South Fork of the Macmillan by the party of D. A. Cameron and L. A. Dugas.

Falco peregrinus anatum Bonap. Duck Hawk.

Four duck hawks, perhaps a single family, were observed flying about a basaltic cliff on the Pelly August 25. Sheldon reports seeing one pursue a scaup duck on the Macmillan October 3.

Falco columbarius Linn. Pigeon Hawk.

Two pigeon hawks seen near the mouth of Moose River October 1 were the only ones noticed on the entire trip.

Falco sparverius Linn. Sparrow Hawk.

Two sparrow hawks were seen by Sheldon at the mouth of the Pelly August 24.

Pandion haliaëtus carolinensis (Gmel.). Osprey.

One was observed flying over the lower Pelly August 25. Several other large hawks seen in the same vicinity appeared to be this species.

Bubo virginianus saturatus Ridgway. Dusky Horned Owl.

Apparently quite common; heard hooting near various camps all along the river, particularly the one at the base of Plateau Mountain. One specimen was collected near this camp August 29.

Ceryle alcyon (Linn.). Belted Kingfisher.

On the entire trip five kingfishers were seen, as follows: One near the mouth of the Macmillan August 26, seen by Sheldon; one near Lone Mountain August 28; one near the mouth of Russell Creek August 31; one near Porphyry Bluff September 20; and one at the base of Plateau Mountain September 22.

Dryobates villosus leucomelas (Bodd.). Northern Hairy Woodpecker.

One seen near camp at the base of Plateau Mountain was the only one observed.

Picoides americanus fasciatus Baird. Alaska Three-toed Woodpecker.

As usual, woodpeckers were very rarely seen. One specimen of this species was taken near camp at the base of Plateau Mountain September 25.

Colaptes auratus luteus Bangs. Northern Flicker.

One taken on upper Russell Creek September 8 was the only flicker seen.

Otocoris alpestris arcticola Oberh. Alaska Horned Lark.

In the Russell Mountains horned larks were rather scarce. A small flock, from which three specimens were collected, was seen on the summit of one of the snow-covered peaks September 4. A high wind was blowing at the time, but the birds evidenced no desire to keep on the lee side of the mountain.

Perisoreus canadensis fumifrons Ridgw. Alaska Jay.

Common about all our camps and seen quite frequently elsewhere. At the Russell Mountain camp they were particularly fond of pecking some fresh moose and caribou skulls for bits of meat and fat. Once, when overtaken by darkness at a distance from camp, I spent the night under a tree in the heavy forest on the side of Plateau Mountain. On waking about daylight I saw two of these jays over my head looking at me. They reconnoitered for a time, keeping absolutely silent, and finally came within 12 inches of my feet, snatched some bits of meat, and hurriedly flew away. I had been walking for miles in this forest the day before and failed to see a jay, but on stopping for a few hours I was found by them. They are great nuisances to the trappers in the early part of the season, as they steal the bait or spring the traps set for marten. John Barr, who traps on the upper Macmillan, told me that for the first two or three rounds of his lines he catches a camp robber in almost every trap.

Corvus corax principalis Ridgw. Northern Raven.

Ravens were by no means numerous. A dozen or more held high carnival over the carcass of a caribou in the Russell Mountains, but before the animal was killed scarcely a raven had been seen. The carcass of a moose exposed on a gravel beach of the Macmillan at the base of Plateau Mountain was not discovered by ravens during the week that we remained in the vicinity. Sheldon reports them abundant on the North Fork of the Macmillan.

Euphagus carolinus (Müll.). Rusty Blackbird.

Not at all common, but scattering individuals were noted at various points. About half a dozen were seen in a small grassy swamp near the mouth of Kalzas River August 27. During a hard snowstorm September 8, I was surprised to flush one of these birds from a swampy spot near the head of Russell Creek. Another was seen in a similar place in the Russell Mountains September 13, and several were found about some extensive grassy swamps near the mouth of Russell Creek September 15.

Pinicola enucleator alascensis Ridgw. Alaska Pine Grosbeak.

A pair of pine grosbeaks was seen during a snowstorm near the head of Russell Creek September 8.

Loxia leucoptera Gmel. White-winged Crossbill.

High flying flocks of crossbills were frequently noted along the upper Macmillan. Two specimens, male and female, were taken near the mouth of Russell Creek September 15.

Acanthis linaria (Linn.). Redpoll.

Seen or heard in large flocks all along the Macmillan. One specimen was collected at the mouth of Russell Creek September 18.

Calcarius lapponicus alascensis Ridgw. Alaska Longspur.

This was the most common bird in the Russell Mountains September 4 to 14. Large flocks frequented the tops of the snow-covered mountains and also the timbered slopes, particularly in the burnt districts. Several specimens were collected.

Spizella monticola ochracea Brewst. Western Tree Sparrow.

Tree sparrows were quite abundant on upper Russell Creek, being found chiefly in thickets of low willows. They were found also along the bank of the Macmillan in considerable numbers. Several were taken.

Junco hyemalis (Linn.). Junco.

Fairly common and generally distributed throughout the region. Several were taken in the Russell Mountains and at the base of Plateau Mountain September 4 to 23.

***Passerella iliaca* (Merrem). Fox Sparrow.**

Only two fox sparrows were noted. One was collected on upper Russell Creek September 8, and the other was seen near the mouth of the creek September 15.

***Riparia riparia* (Linn.). Bank Swallow.**

The clay banks of the lower Pelly and Macmillan are punctured by thousands of the conspicuous burrows of the bank swallow. They are perhaps most abundant near the mouth of the Macmillan, and are scattered along from there on up to the vicinity of the mouth of the Moose River, above which none were seen. The birds themselves had gone south, and therefore we saw none.

***Lanius borealis* Vieill. Northern Shrike.**

Shrikes were often seen in the vicinity of timberline in the Russell Mountains. In the low country only one was observed, this on the Macmillan between Fish Lake and the base of Plateau Mountain.

***Dendroica striata* (Forst.). Black-poll Warbler.**

One straggler was taken in the Russell Mountains September 6. No others were seen.

***Wilsonia pusilla pileolata* (Pall.). Pileolated Warbler.**

Warblers were scarcely to be expected so late in the season, but one of this species was collected near the mouth of Russell Creek September 16.

***Anthus rubescens* (Tunst.). Pipit.**

A few were seen on the summits of the Russell Mountains September 3 and 4. On September 7, after a heavy fall of snow, they appeared in numbers along upper Russell Creek, frequenting the few short stretches of gravel along the bank or in the bed of the creek. Later a single bird was seen along the Macmillan near the mouth of Moose River.

***Cinclus mexicanus unicolor* Bonap. Water Ouzel.**

A few were noted along Russell Creek. One immature bird was collected near camp on the upper part of the creek September 5.

***Penthestes hudsonicus* (Forst.). Hudsonian Chickadee.**

Small flocks were occasionally seen throughout the region. One was taken in the Russell Mountains September 6, another near the base of Plateau Mountain September 23, and another near Lone Mountain October 3.

***Myadestes townsendi* (Aud.). Townsend Solitaire.**

Three solitaires were seen flying erratically about low rocky bluffs near the head of Russell Creek September 8. The air was full of flying snow, and the birds appeared bewildered, but would not permit me to approach within range.

***Planesticus migratorius* (Linn.). Robin.**

In the burnt timber near our camp on upper Russell Creek, robins were abundant September 3 to 10. They were gathered in flocks of 10 to 15 birds, which trooped about through the burnt woods. When alarmed, as they were upon the slightest provocation, they flew in all directions in wild excitement with loud outcries. Along the Macmillan they were not common, the only ones recorded being a flock of 4 or 5 seen near the base of Plateau Mountain September 29. Two were seen by Sheldon on the lower Pelly October 6.

***Ixoreus naevius meruloides* (Swains.). Northern Varied Thrush.**

Several were seen near upper Russell Creek, chiefly in very heavy timber, September 5 and 6.

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