

THE MOUNTAIN SHEEP OF AMERICA

By ANDREW J. STONE

IT IS very near to the century mark since our introduction, but only within a few years that we really began to know these creatures. We heard of them as living in the rugged mountains, growing massive horns and capable of doing many wonderful things, prominent among which was that they would, without hesitation, leap from lofty peaks, landing on their heads among the rocks many feet below without injury.

Audubon wrote of them in 1852; but his description is no longer of value, other

than as a bit of history, and many ideas that the naturalist then entertained have given place to the more perfect knowledge obtained through extended observation.

They are a part of a group that constitute the genus *Ovis* of zoologists. They are ruminants and belong to the hollow horned section, i.e., those having persistent horns composed of conical epidermic sheaths, encasing and supported by processes of the frontal bone. In all the wild sheep of America the horns are present in both sexes, though much smaller in the



"They were so fat I concluded they must have feared the sun would melt their fat."



In the Sheep Country of the Nahama Mountains.

female. They are trigonal in section, having always three more or less distinctly marked surfaces, the upper one being divided by edges running longitudinally to the axis of the horn, in some species sharply prominent, in others rounded off. They are also marked by numerous transverse ridges, more or less prominent, varying, with different species, and they present a strong more or less spiral curve, which varies in direction in different species. The teeth resemble, generally, those of the other *bovidae*. The upper incisors and canines are entirely wanting, their place being taken by a callous pad against which the lower front teeth bite. These are eight in number, all much alike and in close contact; the outer pair represent the canines, the rest the incisors.

The mountain sheep of America are the proudest and handsomest of our wild animals. They are the most perfect combination of strength, hardihood, endurance, agility, beauty, and grace. They are the most delicate in their tastes, and the most artistic in temperament. Their home is the most picturesque, and their food the daintiest. They are extremely timid in the

presence of their enemies, but courageous in battling with the many forbidding elements to which their lives in the high mountains are exposed.

They range through the greatest depth of latitude of any family of the ruminants on the continent, and are instinctively wild. No wild animals are further removed from domestication; they find the most congenial home in the pure air of the wildest mountain countries, and so far, all efforts to transplant and domesticate them have been failures.

According to Indian tradition they once lived in the low lands when the earth was yet in darkness, but when the earth was lighted and the rays of the sun burst suddenly upon them, they were seriously frightened and fled to the mountains, where they have ever since remained.

Indians are not our most reliable source of knowledge in tracing the early history of our animal life, but their story is not entirely improbable, for we have records of much greater changes having taken place in the habits of many of our wild animals.

Many names have been given to the first species of mountain sheep discovered in



Ovis Canadensis is the Largest of the Mountain Sheep.
The Horns Grow to a Circumference of Twelve Inches.

America, and it has required careful investigation to trace the priority between *canadensis* and *cervina*. They were described by Desmarest as *Ovis cervina* in 1804, but it is now generally admitted that Shaw described them as *Ovis canadensis*, in 1803, and there is but little doubt that *canadensis* will be recognized in scientific circles as the name they are fully entitled to bear, and it is now pronounced by many of our best informed zoölogists as of unquestionable priority.

The type locality of the *Ovis canadensis*

to their relatives farther north, nor do their pastures become dry and parched like those ranged by their relatives in California and Mexico. They graze the little mountain meadows just in the upper edge of tree growth, are often found grazing among the timber patches well down the mountain sides, and not uncommonly come down into the valleys to the banks of the large streams. They are the largest and have the heaviest bones of any of the American wild sheep. The horns of the males are massive, curve close to the head,



"The horns of the *Ovis stans* are delicate in pattern, curving gracefully out from the head."

Shaw, is the Rocky Mountains of Alberta, Canada. The high mountain ranges from the Colorado River and Arizona north to the head waters of the Frazer and the Peace rivers are the limits of their range from north to south. The Bad Lands of North Dakota and the Cascade Mountains in Washington are their most easterly and westerly ranges.

The territory occupied by the *Ovis canadensis* is most likely the best suited to the development of these animals of any range occupied by wild sheep in America. They do not experience the long winters known

are deeply corrugated on the upper edge, are very much flattened, and acquire a greater size than those of any of the other varieties. Many of them in very old animals grow to a circumference at the base of more than 20 inches, and I have measured them 19½ inches in circumference at the base and 52½ inches long around the curve. The tips are directed forward and up, and are usually very much broken in the older animals.

The color of almost all animals varies with the different seasons of the year and the condition of the pelage, and the vari-

ous species of the sheep do not give us any exception to this rule. The general color of *canadensis* is a bluish gray, shading to light brown or tawny color when the coat is short, but as the coat grows longer, it grows darker, until in many of the adult males it reaches a deep wood brown tinged slightly with a bluish gray or lead color. There is a dorsal stripe somewhat darker than the rest of the hairs usually prominent, the face is ashy brown, the body brown, the under and inner sides of the legs tawny.

Eighty-one years elapsed before a second variety of mountain sheep in America was discovered. Then was the white sheep of northern North America discovered by Mr. E. W. Nelson, in 1884, and named *dalli* in honor of Professor Dall, of Washington, D. C.

Dr. D. G. Elliott, of the Field Columbian Museum, Chicago, in a synopsis of the mammals of North America, gives the type locality of the *Ovis dalli* as Fort Reliance on the Upper Yukon. Dawson City is the type locality of the newly discovered *Ovis fananni*, or saddle back sheep, described by Wm. T. Hornaday, director of the New York Zoological Society. Old Fort Reliance and Dawson City are in the same locality, and I cannot believe it possible that both varieties live in the vicinity of Dawson and Reliance. Whether Mr. Nelson secured specimens at this point in the flesh, or simply secured some dry skins of Indians that had brought them to Fort Reliance from some distant hunting ground I have no means of knowing, but I am persuaded the latter must be correct, as I do not believe the white sheep range near Dawson or anywhere on the Upper Yukon. The white sheep (*Ovis dalli*) range all of the Rocky Mountains from the Liard River north to the Arctic Coast and west to the Noatak and Kowak rivers in northwestern Alaska. Their range extends south from the head waters of the Colville River, across the Koyukuk River and across the Yukon, following the general trend of the Yukon hills into the mountainous country around the head waters of the Kuskokwim River; from there it spreads to the east and west. Extending east through the great range of mountains at the head of the Kuskokwim, through the Sushitna country, and in the mountains west of the Tanana River, then south to the Copper

River, west to the Kinik, down into the Kenai Peninsula country, and farther west around the north of Cook Inlet on the Upper Nushagak and throughout the region of Lakes Clark and Iliamna.

The *Ovis dalli* occupy the most northerly range of any sheep in the world, and the most extensive of any in North America. They are white the year round, but in summer the ends of the hairs are tipped with rust, giving the coat an appearance as if soiled by sleeping or rolling in clay. In winter the coat gets very heavy and is almost perfectly white. They are not so large as *Ovis canadensis* and their bones are not so heavy. Their horns grow to nearly as great a length as those of *canadensis*, but are never nearly so heavy, rarely exceeding fifteen inches in circumference at the base. They are more round, much lighter in color, not so deeply corrugated, and extend farther from the head. The *Ovis dalli* range entirely above the timber line, very rarely coming down into the timber at any season of the year. This might be attributed to the fact that their country is much troubled with wolves, and they can more readily detect the approach of such enemies in the high open countries. They range very nearly the same character of country the whole year through, the only exception being that the old males climb into slightly more rugged and secluded regions in the summer months.

The next to be described were the black sheep of sub-Arctic America, discovered by the writer in the Che-on-nee Mountains at the head waters of the Stickine River, Northwest British Columbia, in 1896, described by Dr. J. A. Allen, curator of vertebrate zoology at the American Museum of Natural History, New York, in 1897, and named *stonei*, in honor of the discoverer. The *Ovis stonei* range throughout the mountains north from the head waters of the Peace and Frazer rivers as far as the source of Pelly River. They are the handsomest of the American wild sheep and the darkest, shading from a grayish brown to almost black. The adult males are extremely dark in the fall, being almost black over the shoulders, chest, brisket, and legs, shading somewhat lighter on the neck, body, and across the loins; light to medium gray in the face and white on the rump, under the belly, and on the inside of the thighs. They are marked by a dark dorsal stripe.

Like the *Ovis dalli* they range entirely above the timber line. They and the *dalli* are almost identical in size, and their horns are alike very light in color, but the style of horn grown by the *Ovis stonoi* is entirely different from that of any of its relatives, being delicate in pattern and curving gracefully out from the head in a sweeping coil that readily distinguishes it; in this it more nearly resembles the *Ovis poli* of Central Asia than any American sheep. The white rump patch is very white and is in such great contrast with the dark color of the sides of the animal as to render it very striking. The type locality of the *Ovis stonoi* is in the Che-on-nee Mountains, the very heart of the range.

Closely following the description of the *Ovis stonoi* in 1897 came that of the *Ovis nelsoni*, discovered by Mr. E. W. Nelson, of the Death Valley expedition in the northern continuation of the Funeral Mountains, locally known as the Grape Vine Mountains, along the boundary line of Nevada and California, and described by Dr. C. Hart Merriam, of the Biological Society of Washington. Ten specimens were secured, from which their peculiar characteristics were traced.

The geographic range of the *Ovis nelsoni* is not yet known, but it is probably the semi-barren desert country of New Mexico and the Southern United States from Texas to California.

Says Dr. Merriam: "Compared with *Ovis stonoi* recently described by Dr. Allen, the contrast in color is even more marked; but the patterns seem to be the same, and the darkening of the under parts and legs is also a character of *stonoi*." Type locality, the Grape Vine Mountains, or the barren deserts of Southern California.

Dr. Merriam describes the *Ovis nelsoni* as similar to *Ovis stonoi* in pattern of coloration, but much paler; rump patch small and completely divided on median line; tail short and slender; molar teeth very small; upper parts, except rump patch, pale dingy brown; under parts and legs much darker, contrasting sharply with white areas; inner aspect of thighs and posterior aspect of fore and hind legs, white.

Almost four years elapsed after the description of *Ovis nelsoni* without additions to the number of species, when Wm. T.

Hornaday's description of the *Ovis fan-anni* was closely followed by Dr. C. Hart Merriam's description of the *Ovis mexicanus*.

The specimen examined by Mr. Hornaday was that of an adult male, secured by Mr. Henry Brown, near Dawson City, N. W. T., and named in honor of Mr. John Fanin, curator of the Provincial Museum of British Columbia. The specimen was taken in midwinter and described as follows: Entire head and neck, breast, abdomen, inside of forelegs, and rump patch for four inches above insertion of tail, snow white. Entire body except as above, brownish gray, giving the appearance of a white animal covered by a gray blanket. This color is produced by a nearly even mixture of pure white and blackish brown hairs. The gray color covers the shoulders from the insertion of the neck downward to the knee, where it fades out. On the outside of the thigh the gray color grows paler as it descends, until at the hock joint, it fades out entirely. The posterior edge of the thigh is white. The lower portion of the inner surface of the thigh partakes of the gray body color, but is somewhat paler.

On the front edge of the thigh, and extending down to the hoof, is a conspicuous band of dark brown, 1½ inches wide, which, below the hock joint joins rather abruptly the pure white hair which covers the sides and rear edge of the leg. A similar brown band extends down the front of the foreleg, from knee to hoof, similarly backed up posteriorly with white. The tail is similar in color to the body, but much darker, and a thin line of dark brown hair connects it with a gray mass of the body. The horns are clear, transparent, even amber-like, similar to the horns of *Ovis dalli*, when clean; annulations, numerous and well defined; a slight groove under the superior angle is not so deep as that of *Ovis stonoi*. In the type specimen the horns do not spread as in *Ovis dalli* and *stonoi*.

During extensive travel in the north I went completely around the habitat of this new species and frequently obtained information concerning it, but never directly penetrated its country or collected any specimens. Its range comprises a very large portion of the watershed of the Upper Yukon, covering the extensive mountain country of the lower Stewart

River, the Macmillan, the Pelly, the Lewis, and White rivers, ranging west from the western slope of the main range of the Rockies to the mountains east of the Tanana River. They go more into the timber than either the *dalli* or *stonei*.

The last of the series to be described was *Ovis mexicanus*, collected by Mr. E. W. Nelson and Mr. E. A. Goldman in the barren mountains about Lake Santa Maria, Chihuahua, Mexico, in 1899, and described by Dr. Merriam in April, 1901. It is described as being large in size, much darker in color than *nelsoni*, but lighter than *canadensis*; horns massive, dark, not strongly outcurved; hoofs and molars larger than in *Ovis canadensis*; ears long and large, nearly double the size of those of *canadensis*; tail long and slender; color pattern similar to that of *canadensis*. There is no trace of dorsal stripe on the *mexicanus*, and the muzzle is much paler than the rest of the face. The geographical range of the *mexicanus* is not yet known.

Dr. Merriam having found differences in the skulls of the sheep of the western Dakotas and those of Montana, and Alberta, has described the sheep of the western Dakotas as a sub-species of *Ovis canadensis* and named them *Ovis canadensis auduboni* in honor of Audubon, who obtained some specimens from there in 1843.

The females of all the different species wear horns the character of which are very much alike. They are quite flat, slightly annulated, grow upward and backward and outward to a height rarely exceeding eight inches.

The distribution of the northern varieties and the range occupied by each is pretty clearly defined. There is more to learn, however, concerning the ranges of the southern varieties, very especially of those in Mexico, and it will be extremely interesting to know just how far south their ranges extend.

The maximum age of wild sheep, I believe to be about sixteen years.

The general range of the sheep is now pretty well known, and it is hardly probable that many more species will be added to the list. The following table gives the measurements (in millimeters) and the dates of description of the species at present known:

	1861. <i>O. arvensis</i> .	1864. <i>O. dalli</i> .	1867. <i>O. stonei</i> .	1867. <i>O. nelsoni</i> .	1861. <i>O. fannini</i> .	1861. <i>O. montanus</i> .
Total length...	1426	1426	1290	1525	1500	1500
Height.....	1000 to 1070	901	...	830	865	900
Tail vertebra.....	102	89	100	102	120	120
Hind foot.....	419	...	380	...	425	...
Length of horns to over curve.....	208 to 1143	223	762	...	1030	...
Circumference of horns at to base.....	236 to 458	219	366	324	405	...

The following is a list of measurements from a splendid series of *Ovis dalli* taken by me in the Rocky Mountains 66.30 N. in the summer of 1898 (measurements in inches):

	Adult male.	Adult male.	Adult female.	Adult female.	Lamb.	Lamb.
Length.....	50½	55½	51	54	30	30
Tail.....	4	4	3	3½	2½	2½
Tarsus.....	16½	15½	15½	15	12½	12½
Forearm to humerus.....	20	21½	21½	20	16½	16½
Across chest.....	30½	34½	32½	31	24	24
Height at shoulders.....	29	30½	28½	27½	24	24
Depth of body.....	18	17½	16½	16½	10½	10

The habits of the sheep are very regular and very interesting. I have spent days up in the mountains watching them feed and rest and travel. In winter all ages mingle in large bands of various numbers, according as they are plentiful in any given locality. They will paw the snow from the grass where it is only a few inches deep, but they usually keep to high tablelands where the winds keep the snow blown off. The character of their coat is such as to give them great protection against cold and storm, and it is rare that the northern herds seek any more protection from the elements than what they find among the cliffs of rock. The *canadensis* are more accustomed to being in timber and often seek the higher belts of timber during storm, and sometimes come down to the very bottom of the canyons.

The *dalli*, the *stonei*, and the *fannini* simply defy the elements throughout the long Arctic and sub-Arctic winters. Like most animals they do not feed much during severe storms, and will huddle closely, the little fellows crouching alongside the older ones for warmth and protection, while many of the adult males and stronger animals get restless, and prowl

about, walk the highest ridges, and nibble indifferently at the single spears of grass found peeping through the snow here and there. When the storm breaks they will at once set out to some feeding ground of which they have a most perfect knowledge. They know their own home, and always know where to look for food, even when it would seem that every foot of their country was buried deep in snow. It not infrequently happens, however, that during storms they remain in some small rocky cave and the winds drift the snow across their only avenue of escape so deeply that they find their way out with difficulty. The old males are always the first to break their way out and their superior strength is often put to a severe test, but the road made by them is of great advantage to the weaker and younger animals. During the winter season the older males always lead the way from one feeding ground to another.

All through the northern mountains there are high tablelands of varying extent, where the winter winds keep the snow swept away sufficiently for the sheep to reach the tiny blades of grass, and it is on these they range mostly and may be found in bands varying from a very few head to as many as three hundred.

The *dalli* is the only species found in Arctic America, and the long Arctic nights hold no very great terror for them.

I will never forget with what wonder I viewed a small bunch of these animals in midwinter. It was the middle of December and I was traveling east from Herschel Island along the Arctic Coast. We were cutting across a point of land that extended into the sea and had reached quite a high elevation at the foot of some very rugged mountain ridges. The weather was very cold (the thermometer registering about 40° below, Fahr.), but clear and quite calm at the foot of the mountains where we were. It was about noontime, and, although we could not make lunch or boil tea for want of fuel, I decided to give the dogs a short rest after their long, hard climb. There had been no sun in this latitude for weeks, and storms of the worst sort had been frequent. The country was barren of trees and shrubbery of every kind, and the white mountains looked buried deep in snow. I usually kept moving moderately while our dogs were rest-

ing, and on this occasion I was pacing a little knoll viewing with admiration the wonders of my surroundings. To the north lay the great white limitless frozen ocean; to the south rose the towering white mountains. The scene was a perfect, spotless white. One of my Esquimaux called me to look. Glancing in the direction that he was pointing I could make out the outlines of moving objects on the very crest of one of the highest and most rugged mountain ridges. Through my field glasses I discovered a bunch of sheep, almost as white as the snow, and only the fact that they were moving, outlined against the sky, enabled us to first sight them. There were two magnificent rams with heavy horns, three females, and two young ones, and they followed one behind the other in this order, frequently stopping for a moment to glance about, but were making no effort to feed and were evidently following this ridge from one feeding ground to another. The sky was just sufficiently lighted to give their outlines perfectly, and I never gazed at animals with more admiration than I gave those two magnificent rams, as they walked proudly, with heads thrown back, silhouetted so perfectly against the cold blue and purple sky.

They live for months in those high, barren, snow-covered, and storm-swept mountains, with no protection of any kind, not even the cheering rays of a winter sun!

When the sun grows warm in the spring the old rams leave the general herd and steal into the highest mountains, gradually working their way, as the snow leaves the higher elevations, into the very highest meadows. These are generally small, but numerous, and almost always shut in by rugged peaks, making them very secluded and rendering them almost entirely free from every kind of enemy, even a very large per cent. of the most ambitious big game hunters. In these high pastures, surrounded with patches of eternal snow and ice that are piled so deep in many places that the short summers cannot destroy them, they live a quiet, peaceful life, and exchange their old coats for new ones. They have their entire new coat by the middle of July, and it is then they begin to take on flesh rapidly. By the last of September they are very fat; in fact I have seen them in August so fat that they

seemed burdened under the great weight of flesh.

I was once with two companions, one a white man and the other an Indian, high up in the Che-on-nee Mountains, N. W. B. C., hunting *Ovis stoni*. We reached a very high point about 11 A. M. from where several high ridges extended in different directions. I decided we would take up positions overlooking these ridges and watch for game, and accordingly my party located themselves for the purpose, no two being over one hundred yards apart. We had kept our places about an hour, and besides being chilled by the high mountain winds, though the sun was really shining warm, I was growing tired of the inactivity. I never had very much patience in waiting for animals to come to me (the great feature of an Indian's hunting), and I was just thinking of abandoning my position when I heard a low whistle, and, looking around, saw the Indian beckoning. When I reached him he pointed to a patch of snow almost a mile away, and taking my glasses I could see two sheep, one standing and the other lying down on the snow. It was then in the month of August and the Indian remarked, "Sun warm; big ram heap fat; 'fraid his glease will melt."

The two animals soon left the snow and worked their way up the ridge to within a quarter of a mile of us, and again lay down on a patch of snow, where they remained, lying down most of the time for more than three hours. I secured the pair just before sundown and they were so fat that I concluded the Indian was right; they must have feared the sun would melt their fat.

These animals feed in the early morning and evening—always descending the mountain sides to a convenient pasture, working their way to a high ridge for their noon-day siesta, and again at evening, when they paw out a shallow basin in a bed of decomposed shale, a resting place for the night. If they are left undisturbed they will keep to the same locality all summer and may at night always be found on one of two or three ridges best suited to them. Rarely more than three to five adult rams are found together in the summer.

The ewes seek the larger plateaus of slightly lower elevation and, with the disappearing snow the last of April and first of May, bring forth their young. Sometimes twins, but not often. It is really a

wonder that they rear any, but they do bring up a goodly per cent. in spite of wolves, wolverines, eagles, and other animals. The ewes generally keep together in considerable numbers and a single band of them will range back and forth over a few miles of these mountain plateaus, throughout the entire summer.

I never found a more interesting study than in following a bunch of these mothers with their young during the latter part of July in the Che-on-nee Mountains. The ranges suited to them are more restricted in numbers, and are often more difficult to locate than those of the rams. I had hunted the Che-on-nee extensively in '96 without finding a single trace. In '97 I determined to find them, because I wanted to secure specimens and I wanted to know in what kind of country they ranged. With one companion I made the usual hunt for several days without success. I then resolved to travel straight away through the mountains until I found some trace of them. The days were very long then and, selecting from my camp outfit one canvas sheet, one pair of blankets, two small pots, one for tea and one for oatmeal, a little oatmeal, bacon, and tea, we started early one morning for a high level plateau that I had often seen from the summit of the mountains.

At four o'clock in the afternoon, we climbed a high wall and found ourselves on the edge of this plateau. For a mile or so I saw no sign of sheep, and the pasture was not suited to them, all of which was very discouraging. Then skirting a little clump of low rounded knolls we suddenly came in full view of a bunch of ewes and lambs. Retiring behind the knolls undiscovered I led the way behind a series of small elevations with the favor of the wind until I was within five hundred yards of the band. They were feeding in a little swale where the grass, though very short, was kept green by the constant trickling of water from the numerous patches of snow which lay against the sides of the low rounded hills that rose here and there from the surface of the plateau. I watched these animals until nearly dark and then retired to a deep canyon for the night. For three days in succession I sought this bunch of sheep about sunrise every morning, and followed them all day, keeping advantage of the wind and dodging them

by making long detours around hills. With a pair of powerful glasses I could often bring them so close as to carefully study the color of their coats. There were seven lambs, no two with one mother. There were nine ewes of different ages, two three-year-old rams, and three younger animals. During the three days they did not leave the one plateau, whose width was about four miles; and they often fed for half a day within a radius of a quarter of a mile, moving back and forth as gently as if swayed by the wind. No one animal fed constantly, but as the bunch moved forward, those in the lead frequently lay down and waited for the others to feed past them, when they would jump up and join the rear ranks and go to feeding again. They seemed to lie down and to get up instantaneously, as though not a second of thought was given to the act. Sometimes the animals lying down would allow the bunch to feed past them some distance, when they would spring up as suddenly as if frightened and run rapidly until they overtook their mates, then stop and go to grazing as quickly as if their lives depended on immediate food. The lambs would play and frolic about very much as domestic lambs do, but would never bleat. Most wild ruminants live the greater part of their lives in extreme quiet, and our sheep live in greater silence than any other hoofed animals with the exception of the mountain goat. Never, during the three days' watch, did I hear a single bleat. Every night this band would sleep at the top of the little rocky ridges which crossed the plateau, and every morning about eleven o'clock they would leave the grass and climb to the top of one of those ridges, remaining among the rocks and lying about on the decomposed rock or shale until three or four o'clock in the afternoon. None of them would lie down long at a time and there were always five or six of the bunch playing around in a careless, lazy sort of manner. But there were no sentinels on watch, as we so often see pictured.

At the end of the third day I secured one female as a specimen and aimed to get her lamb, but it was behind some rocks and off with the herd too quick for me. The band was terribly frightened and left the plateau entirely.

The next morning I set out to follow

them in hopes of securing a lamb. I had traveled about three miles and was climbing a very rocky hill, when just as I was nearing the summit I saw a lone animal some distance ahead coming toward me. I had been following on the trail of the bunch and my first impression was that I might be near them again, but I soon discovered that the animal coming toward me was a young one, perhaps a lamb, and I hid among the rocks to await results. It did not see me and kept coming in my direction, walking slowly for a hundred yards or so at a time and then stopping to look around for a moment. When it came quite near I could hear it bleat occasionally, but very low. It was hunting its mother on the back track of the band. It was the only bleat I ever heard come from a wild sheep, with the exception of once or twice in the case of a wounded animal. My heart sank within me at the thought of shooting it, but it seemed the most merciful thing to do, and besides I must have a specimen.

It is rare that a wounded sheep utters any cry. They always face death bravely and silently. The young females always remain with the ewes all the summer through, and the yearling males remain with them most of the time, but the two and three-year-old rams are the trail makers. I have often followed the trail of the wild sheep through the mountains with the greatest interest, wondering at the many hoofs it must have taken to wear the furrows I found in the solid rock. The young rams are the travelers, and they are largely responsible for the well-worn trails. They never know what to do with themselves. They feel that it is not just dignified to remain with the ewes and youngsters, and the old rams high up in the mountains disdain their company. So in this restless, unsettled position they travel back and forth between the two, often following the same route scores of times each summer. They never acquire the flesh that the old rams do, for which this restless travel is responsible. In the fourth year the males begin to assume the dignified manners of the adults and, although not fully grown until in the sixth year, they commence to try their strength for supremacy. It is not, however, until they are fully grown that they really do battle royal. No animals fight more viciously than a pair of full-grown rams by butting,

they back up, and run at each other with all their power, coming together with awful force. It is in the head that they can stand the heaviest blow, and when one of the combatants allows his antagonist to strike him in the body, he generally suffers seriously. The only sound ever made in battle is that of the pounding together of heads and horns; the vanquished always accepts his defeat in silence. The victor rarely displays any mercy and will often follow his victim for hours in an effort to inflict further wounds. The southern animals are the greatest fighters and the ends of the horns of the *Ovis canadensis* are nearly always battered off because, being so close to the side of the head, the ends of the horns often receive the full force of the blow from the base or heavy part of the antagonist's horn. The male adult *canadensis* almost always has the appearance of having a Roman nose. This is largely due to bruises on the front of the nose received in battle, which cause the skin to grow very thick. I have killed specimens where this skin was fully five-eighths of an inch thick and almost grown fast to the nasal bones. And in many instances the hair was completely worn off. The males of the northern varieties fight, but not so viciously, and in a large number secured by me in different localities I rarely found either the horns or the noses of the animals seriously battered. The old story that the rams jump from cliffs alighting on their heads among the rocks many feet below without injury, is a myth. They practise no such thing. They leap down rugged places, but they always aim to land on their feet. Wherever the rams go the ewes and young will go, and the latter have no heavy horns.

In scaling dizzy heights the *Ovis dalli* has no superior. I once located three young rams while hunting the *Ovis dalli* in the Northern Rockies, that were resting on a ledge seemingly not more than a foot in width on the face of an almost perpendicular cliff fully five hundred feet below the top. I watched them some time by lying down and peering over the top of the wall. I directed my Indians to throw stones at them, knowing that when they were disturbed they would find some route to the top of the cliff. Pretty soon I could hear them traveling the face of the cliff and I could tell by the sounds which way

they were going. I ran as fast as I could in the same direction and saw two of the animals show up on the brink of the high wall about four hundred yards ahead. I fired a hurried shot, just as they saw me and were turning to run, but failed to hit either of them, and they were soon safely out of reach.

I kept going and was within one hundred and fifty yards of where they had stood when the third animal showed up. I fired, missing him the first shot, but bringing him down with the second. In his death struggles he went over the face of the cliff and rolled down to a little bench about three hundred feet below. With me were three splendid young Indians and one of them had with him a long rope, but with the aid of this and by trying every possible means of descent we could not get down that cliff any place, even where the animals came up, and were compelled to leave our specimen untouched, although we were badly in need of food and that ram represented the only food in sight.

In the possession of Mr. Madison Grant, secretary of the New York Zoological Society, is the head of a four-year-old ram which I secured in the Rockies, about 66° North latitude, whose performances are worthy of record as showing the footing and endurance of these animals. The Indians I had with me on this trip were as wretched hunters as Indians can possibly be. One of them reported in camp one evening that he had crippled a ram but failed to secure him. This fellow had previously used up nearly two hundred rounds of ammunition without securing a single animal, and I did not believe that he had really crippled one. I am very much averse to leaving cripples in the mountains, however, and I decided to take all my help the following morning and look for this one. We rounded the crest of a high plateau in the country the Indian claimed to have hunted, and on reaching a certain point, he told me to wait, saying that he was going into the canyon below to look for the fellow. My other two Indians wandered off in another direction hunting, and I remained alone to await results. Two or three hours had elapsed when I heard a hallooing, and looking down the canyon in the direction from which the sounds came, saw the Indian

working his way up the bottom and could make out the ram hobbling along among the rocks some distance ahead of him. I could not at first understand what the Indian was trying to do, but soon concluded that he had determined on driving the specimen to the top of the plateau where I was, rather than to help carry it up, believing I would be on the lookout and finish it when it reached the top. I felt pity for the poor cripple and could I have reached it in time I should have tried to save it the climb, but as it was I could only wait. I had no thought of failing to put an end to its life when it came up at the head of the canyon, and had taken a seat on a rock about one hundred yards from where I expected it. As it stood on top, I saw that its left thigh was crushed, the leg hanging entirely helpless, and the whole thigh and rump were red with blood, presenting a ghastly sight. It stood still for a moment on three legs, and, turning its head in my direction, looked straight at me without moving. I raised my rifle and fired at its shoulder. It dropped to the ground and rolled completely over. I was so satisfied that I had killed it that I dropped my rifle and started forward. I had scarcely risen to my feet when the ram was up and off, going at a remarkable speed, his left hind leg swinging in the air like a pendulum. I was so astonished that I never thought of my rifle until he was out of my reach, and then I went after him, rifle in hand as fast as I could go, but he disappeared over a canyon wall before I could get a shot. The Indians soon joined me in the chase, but the first we saw of him he was perched on top of a high spiral rock that rose abruptly from the face of the canyon wall about two hundred yards below us. I could not shoot him there, for if I did he would have tumbled off and gone to pieces on the rocks below. I sent the Indians down to drive him from the top of the rock, expecting they would kill him when he landed on the slide below. I stood watching the fellow, wondering what he would do next and feeling half sick at the thought of his suffering. When he saw the Indians coming he went down the side of that rock almost as if he had wings, and was soon far ahead of them down the canyon.

The Indians then separated and commenced a long chase up and down that canyon after the ram, keeping it up until

two of them gave out and came back to where I was. I could see every move, and I began to think that the ram must possess several lives. The third Indian kept on, but was a long way behind the ram, which had turned back toward our position. It came up the canyon until just about even with us, when it turned directly toward us up a little side canyon. Climbing to a position of not more than two hundred yards below it found its way up a very abrupt cliff wall and disappeared. Adjusting my glasses I discovered that it had entered a large cavern in the face of the cliff, and I could very clearly make out the outlines of its white body in the shadows of the cavern, and could see that it was lying down. At length the Indian climbed to where he could see the ram, but he could not get it, and I knew that if he shot it where it was, he could not get it. He commenced pelting the wounded ram with stones and it jumped up, came to the mouth of the cavern and after a moment's hesitation, turned directly around the face of the cliff, that to all appearances was almost perfectly straight up and down without any visible foothold. It proceeded for about thirty feet around the face of the cliff, and then, as if to show us just what a ram could do, it turned completely around and walked back to its starting point and leaped to the rocks fully fifteen feet below, falling as it landed. Another chase took place, the Indian bringing it down with a shot a half hour later. It was so fearfully mangled and its white coat so saturated with blood that I could save only the head, which was a very pretty one. The only ball I had fired at it had struck it in the left side, just behind the shoulder and ranged upward and backward not far from the heart, passing out at the right flank. It had sustained most painful injuries the day before, had bled profusely from the wound I gave it, both externally and internally, and yet it not only clung to life, but performed in a way almost beyond the belief of those who witnessed it.

Wild sheep depend for greatest protection on their climbing capabilities. They travel where no man can follow and often in climbing use their knees instead of their forehoofs. Their first instinct at the approach of an enemy is to start for the mountain top, aiming if possible to get

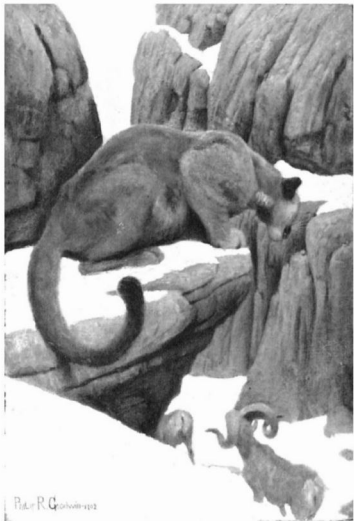


Photo R. G. Grosholz 1992

Lying in Wait



In Winter the Coat of Ovis Dalli is Almost Perfectly White.

above and keep above the enemy. The greatest exception I ever found to this rule was among the white sheep of the Northern Rockies, which have run straight away from me down the mountain, crossing deep canyons below in preference to skirting the mountain I was on. The stories told of rams always standing on watch while the rest of the herd is at rest are purely visionary. Many artists have accepted this idea and many hunters believe in it, and honestly enough, too. But I have frequently seen bunches of every class of these animals perfectly unconcerned, without a single member of the herd making any pretense at standing guard. The movements of sheep are rather remarkable; they will trot, gallop, and lope, but the trot is very little indulged in, and the gallop is a gait they always take very leisurely. When they are alarmed or travel rapidly they lope and often jump stiff legged for long distances at a time over every sort of country.

Although surefooted they often get falls, sometimes quite serious ones. On several occasions I have killed a female whose lower jaw had been broken, evidently from a fall on the rocks. They are fond of salt,

especially in the spring, and often visit licks or places where salty or brackish water oozes from the earth, where they will lick and gnaw at the ground.

Wolves, wolverines, and eagles are their most common enemies, and the lambs suffer extensively from these. Wolves are capable of taking down grown animals, but in summer hunger seldom induces them to make the struggle, and in winter they prefer lower altitudes. There are many stories told of the lordly ram doing battle with wolves, which are on a par with the story of their leaping from dizzy heights. The old rams are cunning and in this lies their greatest safety. They are perfectly at home on rocky ledges, where the wolf is not, and if they can gain such a position they will, with one charge, hurl the wolf to the rocks below. But by this method of battle only can sheep defend themselves against wolf or wolverine. It is not uncommon for a band to start a snowslide and the whole lot to go down with it to their death, but the loss from such causes is inconsiderable.

The prospector and the white hunter who live in the mountains, and the Indians, who now all carry firearms, are re-

sponsible for the destruction of these beautiful animals. The Indians used to snare them and kill them with bows and arrows by hiding behind rocks near their trails.

On what is known as Black Mountain, just inside the Arctic Coast and to the west of the Mackenzie delta there yet stands a stone fence constructed by the Tooyogmoots, a tribe of Eskimo now extinct, for the purpose of snaring the sheep. They left openings in the fence at regular distances and at these openings set their snares.

Almost all the northern Indians and the Eskimo to the west of the Mackenzie, in Northwest Territory and Alaska, use the skins of the sheep extensively for clothing, and the horns of the animals are split and steamed and bent into shape for spoons, some of them very artistically.

If American ruminants lived in flats, the

buffalo would be on the first floor; the moose, elk, and deer on the first and second floors; the caribou on the second and third floors; the sheep on the third and fourth floors; and the goat on the top. In this way one may locate their relative positions as to altitude.

Sheep hunting is an adventurous sport, full of excitement and had climbing. While it does not demand the skill and woodcraft of still-hunting, it is one of the grandest sports indulged in by American big game hunters, and is experienced by fewer of them than any other sort of big game limiting.

I have been caught in cold rains, hail storms and in sleet and wet snows, high up in the mountains when it seemed my life would be chilled out of me in spite of my best efforts to keep my blood warm. I have been caught on the face of rugged



Field Work in Tassellmy.

mountains where I could scarcely hold on, when wind storms would come sweeping down and take such hold of me as to almost break my hold on the rocks. During weeks in the Rockies between 66° and 67° North I have lived almost without shelter, experiencing every sort of storm. I have traveled all day in the cold rain and with only a single pair of blankets slept in the rain all night. One might live a rather luxurious camp life while hunting the *Ovis canadensis*, but if one would get to know such animals, he must actually live

weather was perfect, so we never put up shelter during the entire trip, but slept in the open. Near where we slept was a little mountain lake, clear as crystal, through which flowed a stream of water, just from the snow and almost as cold as ice. Around us rose the rugged canyon walls and at the foot of one of these was a great stretch of snow many feet deep. We kept our fresh meat buried in the snow, which proved a most convenient ice box. Every day we would climb these high ridges and travel them for miles hunting sheep and viewing



The Sheep Is Very Tenuous of Life, This One, Several Times Shot, Led the Hunters Many Miles Over All but Impossible Cliffs.

in their country, prepared to follow them at all times of the year and under all kinds of conditions. I have spent months high in the mountains, and studying and hunting these animals without tasting food from civilized lands, sharing the life of my savage help and facing the elements without sickness or a cold.

Once, on the other hand, I camped in the Che-on-nee mountains just in the mouth of a canyon and at the foot of high ridges where the sheep were accustomed to range. Our only fuel was a few small scrub balsam and alders, but it was August and the

one of the grandest panoramas of mountain scenery in the world. I Left our camp one day with two men, a small piece of canvas, one pair of blankets, and a frying pan. We had but little care as to where night should overtake us, and just before sunset I killed two magnificent rams. We cooked our fresh steaks on a fire of dead willows and the three of us slept warm and comfortable on top of the piece of canvas with the one pair of blankets over us.

This is the cheerful side of sheep hunting.